Courses and Curricula

Berkeley students and faculty use the nation's most powerful magnetic resonance imaging scanner devoted solely to brain research — a tool that opens the way for discoveries of how aging and disease affect memory and attention. This work in neuroscience is part of Berkeley's Health Sciences Initiative, a multidisciplinary offensive to advance cancer treatment, stem infectious disease, deliver drugs more effectively, and develop technologies and therapies for healthier, longer life.
African American Studies (College of Letters and Science)

Department Office: 660 Barrows Hall, (510) 642-7089
Chair: Charles Henry, Ph.D.
Professors
William M. Banks, II, Ed.D. University of Kentucky.
Counseling psychology, black social psychology
Charles Henry, Ph.D. University of Chicago. Black politics, public policy
Juhani Paavola, poetry and essays
Michel S. Laguerre, Ph.D. University of Illinois. Caribbean anthropology
Margaret B. Wilkerson, Ph.D. University of California, Berkeley. French, Spanish, Lorraine Hansberry

Associate Professors
VeVe Clark, Ph.D. University of California, Berkeley.
Francoophone and Anglophone literature of Africa and the Caribbean
Percy Hintzen, Ph.D. Yale University. Political sociology, social change
Stephen Small, Ph.D. University of California, Berkeley. Sociology
Ula Taylor, Ph.D. University of California, Santa Barbara.
American history

Lecturer
Silvester Henderson, M.A. San Francisco State University.
Music

Affiliated Professors
Ruth Wilson Gilmore, Ph.D. Rutgers University. Race, gender, labor and social movements, uneven development, politics and culture, the U.S., California, the African Diaspora (Geography)
Jocelyne Guilbault, Ph.D. University of Michigan. Caribbean music studies, popular music, cultural studies (Music)
Waldo E. Martin, Jr., Ph.D. University of California, Berkeley. Recent U.S. black, cultural (History)
Tyra Mies, Ph.D. (Ethnic Studies)
Trinh T. Minh-ha, Ph.D. University of Illinois. Feminist theory, film theory and production, comparative literary and art theory, cultural politics, Third World arts and politics
Helen Mitchell, Ph.D. Washington University. St. Louis, Missouri. Counseling psychology
Mary Lovelace O'NEAL, Ph.D. University of California. (Art Practice)
Olly Wilson, Ph.D. University of Iowa. Composition, 20th-century, African-American music (Music)

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 Europe. 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.

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 AAS 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 courses focused on a specific area of concentration. Such a concentration is expected to form the basis for a senior thesis. Five of the eight core courses must be selected from African American Studies departmental course offerings. The remaining three courses may be taken from other departments. A 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 3.3 or higher in all University work, as well as a 3.3 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, AAS 4B, AAS 5A, or AAS 5B and five upper division courses in the Department of African American Studies. In order to complete the minor program, courses should be chosen to reflect one of the specified areas of concentration. A list of these areas can be obtained from the department office.

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 courses 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 old curriculum must consult with the department regarding the breadth requirement. Refer to requirements listed in the College of Letters and Science announcement, “Earning Your Degree.”

Graduate Program

Students are admitted to graduate study in the fall semester only. Applicants must file a University of California, Berkeley graduate application; three 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 interest; GRE taken within the last five years (scores must be reported by the Educational Testing Service); and TOEFL (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 and national 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 in the organization of political economy 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 Africa, Africa, North America, and the Caribbean (broadly defined) of persons of African descent. Applicant records must also demonstrate proficiency in a foreign language at the undergraduate level comparable to Berkeley’s language requirement.

Fields of Emphasis

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

Issues of Development. History of the African Diaspora; Social and Cultural Institutions; Urban Sociology; 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. Thus every graduate student must enroll in and complete a minimum of 4 units of upper division or graduate course work or both per required semester of academic residency. 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 course work with a minimum GPA of 3.3, the department will administer a pre-qualifying examination based upon 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: Subject A. 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,SP) Staff

B prefix=language course for business majors
C prefix=cross-listed course
P prefix=honors course
R prefix=course satisfies R&C requirement
AG suffix/course satisfies American cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

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Air Force ROTC

(See Military Officers’ Education Program)
R1B. Freshman Composition. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Subject A and 1A. Formerly 1B. Continued training in expository and creative writing with more emphasis on literary interpretation. Satisfies the second half of the Reading and Composition requirement. (F,SP) Staff

4A. Africa: History and Culture. (3) Three hours of lecture and one hour of discussion per week. Emphasis on colonization, colonial, post-colonial, political, and economic structures; introduction to art, literature, oral traditions, and belief systems. (F)

4B. Africa: History and Culture. (3) Three hours of lecture and one hour of discussion per week. Emphasis on the roles of modernization, urbanization, and the emergence of contemporary African states. (SP)

5A. African American Life and Culture in the United States. (4) Three hours of lecture and one hour of discussion per week. Study of the modern civil rights movement, and of African American culture, approached through an examination of selected art forms, historical themes, and intellectual currents. (F,SP) 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 factors leading to the development of the collective African American experience. (SP) Banks

C15. Geographies of Race and Gender. (4) Three hours of lecture and one hour of mandatory discussion per week. What can geography contribute to our understanding of gender inequality and racial discrimination in a globalizing world? The course examines how supposedly "natural" differences are actually produced through everyday practices in particular spatial contexts; how historical and cultural geographies of race and gender are constructed and contested in relation to those and other parts of the world, including South Africa; and how these concepts and comparative historical geographies can help us think critically and constructively about questions of race and gender in the global context. Also listed as Geography C15 and Women's Studies C15.

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 Berkeley Seminar Program has been designed to provide new students with the opportunity to participate in an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP)

25AC. Male and Ethnic in American Culture. (3) Two hours of lecture and one hour of discussion per week. The course examines the interplay of ethnicity and male gender in three groups, Italians, Puerto Ricans, and African Americans. Interdisciplinary in approach, the course will reveal the complexities of gender, class, and race in the social quilt of American life. This course satisfies the American cultures requirement. (SP) Banks

26. Black Music and Musicians in American Culture. (2) One and one-half hours of lecture per week. Examines the impact of African American music, and the artists who produce it, on American culture in the 20th century. (F,SP) Banks

27AC. Lives of Struggle: Minorities in a Majority Culture. (3) Three hours of lecture per week. The purpose of the course is to examine the many forms that the struggle of minorities can assume. The focus is on individual struggle and its outcome as reported and perceived by the individuals themselves. Members of three minority aggregates are considered: African American (so called), and Chicanos/Latino Americans. The choice of these three has to do with the different histories of members of these aggregates. Such differences have produced somewhat different approaches to struggle. This course satisfies the American cultures requirement. (F,SP) Hintzen

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 U.S. (African Americans, Asians, Chicanos) and their cultures of origin, in the 19th and 20th centuries. The course will explore the concepts of "migration," "transnation," "otherness," "multiculturalism," and "global village" and will draw largely on social science perspectives. This course satisfies the American cultures requirement. (SP) Small

29AC. Theater and Culture Identity. (4) Three hours of lecture and one hour of discussion per week. This course will explore the ways in which American theater and drama create images and influence the social perception of group identity, and will introduce students to cultural perspectives as presented in theater. Plays written by Chicanos/Latinos, European American, African American, and Asian American women and men will provide basic texts for the course. This course satisfies the American cultures requirement. (F)

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, and topics vary from department to department and from semester to semester. (F,SP) Staff

98. Directed Group Studies 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. Supervised research. Must be taken on a passed/no passed basis. Supervised research on specific topics related to African American Studies. (F,SP)

99. Directed Group Studies 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. Supervised research. Must be taken on a passed/no passed basis. Supervised research on specific topics related to African American Studies. (F,SP)

Upper Division Courses

100. Introduction to African American Studies. (4) Three hours of lecture and one hour of discussion per week. (F,SP) Banks

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 differ from year to year, basic public policy methodology will be introduced each year.

108. Black and Male in American Life. (3) Three hours of lecture per week. Prerequisites: 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) Banks

111. Race, Class, and Gender in the United States. (3) Three hours of lecture per week. Prerequisites: Reading and composition requirement. Emphasis on social history and comparative analysis of race, class, and gender relations in American society. Examines both similarities and differences, and highlights gender politics.

112A. Political and Economic Development in the Third World. (4) Four hours of lecture per week. An examination of the structural cause of Third World underdevelopment and the broad spectrum of theoretical positionalities put forward to explain it. Underdevelopment will be viewed from both the international and intranational perspective. (F) Hintzen

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 in their 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 examples that represent the diversity of developing countries. (SP) Hintzen

116. Colonialism, 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) Taylor

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

119. Selected Topics in the Sociohistorical Development of the Black 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. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 56 or 116 and 117 or History 125A-125B. Analysis of the theoretical development of African Americans’ political forms and expression. Examination of local, state, and federal political processes and activities, the development of black political ideologies, organizations, and movements. Henry

122. African American Families in American Society. (3) Three hours of lecture per week. Prerequisites: 56 or introductory course in sociology. Examines the historical roles and functions of families in the development of black people in American society from slavery to the present.

123. Social and Political Thought in the Diaspora. (3) Three hours of lecture per week. An examination of social and political thought of Africans traveling across the Diaspora, with particular focus on the 19th and 20th centuries. (F,SP) Small

C124. Political Philosophy of Martin Luther King, Jr. (3) Three hours of lecture per week. Using the thought and actions of Martin Luther King, this course examines the major events of the Civil Rights Movement. Readings include original works by King as well as secondary sources, with a special emphasis on African American religion, nonviolence, and integration. Also listed as Religious Studies C175. (F,SP) Henry

125. History of the Civil Rights Movement. (4) Three hours of lecture per week. Prerequisites: Subject A and 1A. Formerly 1B. Continued training in expository and creative writing with more emphasis on literary interpretation. Satisfies the second half of the Reading and Composition requirement. (F,SP) Staff

130. The Civil Rights Movement. (3) Three hours of lecture per week. Examination of the structural causes of the Civil Rights Movement. In addition to the major developments of the movement, the course is designed to expose students to the literature of these events, including the work of famous spokespersons. (SP) Banks

132. The Civil Rights Movement. (3) Three hours of lecture per week. An examination of the social movements that have occurred in American society over the past century, with special attention to the Civil Rights Movement. (SP) Banks

135. History of the Civil Rights Movement. (3) Three hours of lecture per week. Prerequisites: Subject A and 1A. Formerly 1B. Continued training in expository and creative writing with more emphasis on literary interpretation. Satisfies the second half of the Reading and Composition requirement. (F,SP) Staff
the readings in context, discussing the material and its significance in the overall history and culture of African Americans. Visual and musical media will augment the class lectures. (F,SP) Taylor

126. African American Women’s History. (4) Three hours of lecture per week. The objective of this course is to examine the contributions of African American women to the American experience from colonial times to the present, with a focus on the intersection of race, gender, and class. Assigned readings will be chosen to place this movement in the context of global developments. (F) Taylor

128. Resistance and Self-Determination. (3) Three hours of lecture per week. An examination of various forms of resistance and self-determination engaged in by people of African descent in key historical and geographical contexts. The course will consider the political and social context of these resistance movements. (F,SP) Smalls

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

C132. 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. Examination of psychological research and theory pertaining to African American people. Emphasis on understanding the concepts, methods and conclusions regarding African Americans offered by American psychology from its origins to the present. Also listed as Psychology C105.

135. Caribbean Cultural History. (3) Three hours of lecture per week. Examination of the history and cultural evolution of the French, Dutch, Spanish, and English-speaking Caribbean societies from the slavery era to the Second World War. Particular attention will be paid to African-Caribbean cultural institutions and practices, with a focus on the impact of Chinese, East Indians, Lebanese, Canary Islanders, and Jews during the post-emancipation period; political history; and the historical and structural evolution of Caribbean cities. (F) Laguerre

136AC. The Minority Question in American Society. (4) Three hours of seminar per week. Faculty: Taylor. Minority status is ascribed to some ethnic groups, a stigma imposed on them by the dominant system of power as a result of prevalent discriminatory practices of the state. This seminar examines the social construction of minority status as a chronic minor, the conditions under which such a practice by state apparatus is made possible, the negative impact of this practice on minority identity formation, and the struggle for minority empowerment and liberation. The technology of the reproduction of the minority status of Anglo women, Mexican-Americans, African Americans, Asian-Americans, and Dominican-Americans is analyzed through the lens of the construction and differentiation of citizenship. Theoretical models that explain the mechanisms of the mode of incorporation, containment, and expansion of ethnic minority groups in their host societies are reviewed with an emphasis on understanding their strengths and weaknesses. This course satisfies the American culture requirement. (F) Laguerre

137. Multicultural Communities. (3) Three hours of seminar per week. Examination of the theoretical issues in urban anthropology and sociology pertaining to the United States as a multicultural society. Comparative analysis of the ecology and social structure of African American, Native American, Asian American, Mexican American and Afro-Caribbean urban communities with special emphasis on social class, ethnic, and cultural identity. (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,SP) 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. Prerequisites: Determined by offering. Topics will vary each semester. (F,SP) Staff

142A. Third World Cinema. (4) Three hours of lecture, plus two hours of viewing/discussion per week. Prerequisites: Reading and composition requirement. Examinations of lectures and a selection of films, the development and achievements of Third World motion picture artistry, and the 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 assessment. (F,SP) Staff

142B. The Cross-Cultural Images of African 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 America and other African ethnic minorities, with attention to comparative changes in their cinematic depictions, from the silent era to the present. Important works that formed specific images of the different African societies are discussed, and their impact on major works from Asia, Africa, and Latin America. Other newly developed film sources from abroad are presented for critical assessment. (F,SP) Staff

142C. Scenario and Film Criticism. (3) Three hours of lecture per week. Prerequisites: Completion of reading and composition requirement, plus 142B or equivalent. The development of scenarios and critical writing for motion pictures, with specific attention directed toward subject-matter concerned with ethnic groups in the United States. A workshop approach is emphasized, with limited enrollment, and seminar discussions of the projects involved.

C143A. Performance: An African American Perspective. (3) Three hours of lecture per week. Prerequisites: 1A or consent of instructor. Introduction to the Research-to-Performance Method, African American aesthetics and dramatic performance techniques. Course will survey wide range of writings on performance and investigate applications through exercises and improvisations. Students will also assist in information gathering for works in progress. Also listed as Dramatic Art C183A.

C143B. Research-to-Performance Laboratory. (3) Three hours of lecture per week. Prerequisites: 143A or consent of instructor. Development of scholarly material for the theatrical adaptation and enhancement of dramatic performance techniques through discussions, improvisations and readings of work created 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 Dramatic Art C183B.

C143C. 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 written 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 Dramatic Art C183C.

144. Introduction to Cultural Studies. (4) Three hours of lecture per week. Prerequisites: Reading and composition requirement. This course examines the theories of culture and consumption, and issues in popular culture. The course focuses on the instrumentation of culture as a vehicle of domination and resistance. The goal of the course is to provide the student with a critical vocabulary for cultures to be examined are ideology, hegemony, articulation, race and gender formation. Students must have a willingness to engage new and difficult ideas.

C145. Gospel Chorus. (2) Course may be repeated for credit. Three hours of large ensemble and one hour of sectional rehearsals per week. A course that will focus on the performance of choral music of the African American gospel music tradition with a particular emphasis on contemporary performance techniques. The Gospel Chorus provides the case with the opportunity to perform at Universityursosonic performance ensembles, will prepare music to be presented to the public in at least two concerts each semester. Students will be selected for the chorus on the basis of individual auditions. Also listed as Music C143. (F,SP) Henderson

C146. History of the African American Music Theatre. (3) Course may be repeated for credit per acceptance of petition. Three hours of lecture per week. Prerequisites: Dramatic Art 120, senior standing, or consent of instructor. An examination of the origins and development of musical theatre productions, created, and performed by African Americans, with a view towards elucidating the dynamic role that African American musical theatre has played in the development of the mainstream African American musical theatre drama. Also listed as Dramatic Art C133.

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)

C151A. African American Plays from 1858 to 1959. (4) Three hours of lecture per week. Prerequisites: Reading and composition requirement. Historical survey of plays by African American writers and the portrayal of the black experience in theatre. Emphasis on the origins and development of musical theatre productions, created, and performed by African Americans, with a view towards elucidating the dynamic role that African American musical theatre has played in the development of the mainstream African American musical theatre drama. Also listed as Dramatic Art C131.

C151B. Contemporary African American Drama. (4) Four hours of lecture per week. Prerequisites: 151A or consent of instructor. Survey of contemporary plays by African American writers and the portrayal of the black experience in theatre. Emphasis on the origins and development of musical theatre productions, created, and performed by African Americans, with a view towards elucidating the dynamic role that African American musical theatre has played in the development of the mainstream African American musical theatre drama. Also listed as Dramatic Art C131B. (SP) Wilkerson

152A. African American Essays: The Nature and Traditions. (3) Three hours of lecture per week. Prerequisites: Reading and composition requirement. Discussion and analysis of the historical development, use, achievement, and experimentation in the essay form of African Americans. (F)

C152C. African American Dramatic Literature: Forms and Styles. (4) Three hours of lecture/laboratory per week. Introduction to play analysis with emphasis on the primary theatrical form of styles chosen by African American playwrights and the thematic consequences of these choices as analyzed both as literary and as theatrical production; e.g., laboratory will include attendance at plays and performance of plays. Also listed as Dramatic Art C132.

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. 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. Course explores the literature of the 19th-century African American woman, an expanding field in Amer-
ian literary discourse. Also listed as Women’s Studies C153A. (F)

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. Analysis of the cultural and social assumptions and dynamics that shape the image of the African American woman in contemporary American writing. Also listed as Women’s Studies C153B. (SP)

154. Negritude: French African Literature. (4) Three hours of lecture per week. Prerequisites: Reading and composition requirement. An introduction to Negritude and racial consciousness in the creative and political writings of the Negritude writers. Includes close readings of works by Aimé Césaire, Leon Damaras, Frantz Fanon, Cheikh Hamidou Kane, Ferdinand Oyono, and Joseph Zobel. Students learn to re- vise the literary history of Negritude (1931-1966) through examinations of primary sources. Clark

155. Literature of the Caribbean: Significant Themes. (4) Three hours of lecture per week. Prerequisites: Reading and composition requirement. An introduction to representative works, themes, and discourse in Caribbean literature—produced by authors from the Anglophone, Creoleophone, Francophone, and Hispanophone areas within Plantation America. Includes examinations of indigenous folkways and national language development. (SP) Jordan

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. An introduction to the study of poetry. The course introduces students to poetry as culture, history, criticism, politics, and practice. Focusing comparatively on poetry from three American racial/ethnic groups, this course requires students to learn both the technical and cultural dimensions of poetry as well as the literary worlds of which they form part. The course includes discussions of the role of poetry in society and literature. (F,SP) Jordan

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 under- take an intensive study of both the techniques of poetry and the social and cultural contexts of specific poetic traditions. The course introduces students to the art of poetry, and in the third phase of the course, students write critical papers comparing poetic tradi- tions, and complete an original manuscript of new poems. In addition, students must produce an on-campus poetry reading. (F) Jordan

158B. Poetry for the People: Practicum. (4) Four hours of seminar, plus peer teaching and performance. Prerequisites: 158A. A teaching practicum, with the regular and active supervision of the instructor, for students who have 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 ten 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) Jordan

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 read- ings within the contexts of their articulation from the 1930s through 1980s, from dependence through in- dependence and neo-colonialism or post-colonial writ- ing. Clark

161. African Theater. (4) Three hours of lecture per week. Prerequisites: 160 or consent of instructor. The course introduces readers to dramatic texts produced in France, Africa, and the Caribbean from 1958 to the present. From Genet to Brecht to Aime Attou’s Anowa, 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: Marassa. (4) Three hours of lecture per week. This course in literary theory uses concepts of twinning in African Diaspora discourse as a means of over- coming binary oppositions in contemporary writing by women authors from the Caribbean. Includes novels and testimonial literature by authors from the Creole, English, French, Portuguese, and Spanish Caribbean—namely, contemporary works by Merle Hodges, Jean Rhys, Synne Schwartz-Bart, Carolina deJesus, and Rosario Ferre. (F,SP) Clark

163. African Literature by Women. (4) Three hours of lecture per week. Prerequisites: Reading and composition requirement. Focus on the writing of poetry by women authors from East, Southern, West Africa, and the Maghreb. Course explores 19th-century orature, early settler narratives, and 20th-century significant themes and discourses. Includes novels of bride price, motherhood, the veil, apartheid, novels of formation, and narratives. (SP) Clark

192A-192B. Senior Thesis. (3;3) Three hours of re- search per week. Prerequisites: Senior standing and two-thirds of the courses required in the major. Research paper or seminar project conducted under the direct supervision of a faculty sponsor. Subject must be approved by faculty sponsor no later than the preceding semester in which the course is to be taken. For the senior seminar, students must achieve a C grade or better in each part of the sequence. Applications and details at departmental advisor’s office. This se- quence is required for the major. (F,SP) Staff

195A-H195B. Senior Honors Thesis. (3-3) Regu- lar individual meetings with faculty sponsor. Credit and grade to be awarded on completion of sequence. Prerequisites: Senior standing and 3.3 GPA overall and in major. The student will complete a primary research project and write a final paper in an advanced topic with faculty sponsor. Fulfills department thesis re- quirement. Application and details at departmental ad- viser’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 passed/not passed basis. Supervised field work in off-campus orga- nizations. 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 Cur- ricula section of this catalog. Must be taken on a passed/not passed basis. Supervised research on an advanced topic. (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 Cur- ricula section of this catalog. Must be taken on a passed/not passed basis. Forms for independent study are available in the department office. (F,SP) Staff

Graduate Courses

201A. Interdisciplinary Research Methods. (4) Three hours of seminar per week. This seminar will provide a detailed introduction and working knowledge of the various methodological techniques appropriate for interdisciplinary research on the African Diaspora. (SP) Henry

201B. Qualitative Research Methods for African American Studies. (4) Four hours of seminar per week. A review of commonly used qualitative research techniques. This course is de- signed for graduate students who choose to become experts in qualitative research methods. There is a special emphasis on survey research techniques and protocols. Each student will be expected to have be- gun a project in 201A designed for survey research techniques and computer-based quantitative data pro- cessing procedures. Students will concentrate on the phases of the project that require questionnaire design, structuring, interviewing, data processing, and data anal- ysis. (Hintzen)

240. Special Topics in Cultural Studies of the Di- aspora. (1-4) Course may be repeated for credit. One to four hours of lecture 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. (1-4) One to four hours of lecture 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

250. Black Intellectuals: Social and Cultural Roles. (4) Three hours of seminar per week. This course will examine the development of an intellectual group in African American life from the 18th century to the pre- sent, and explore the examination of the social and cultural roles, writers, scholars, artists, and other thinkers who have played in American and African American culture. (SP) Banks

251. African American Women’s History. (4) Three hours of seminar per week. This course will focus on the experiences and contributions of African American women from the American Colonization Society to the present. This course will examine the lives of women who have contributed to the women’s movement, the women’s rights movement, and the civil rights movement. (SP) Taylor

251B. Feminism and the Black Nationalist/Pan-African Tradition. (4) Three hours of seminar per week. This seminar will examine some of the historical, political, economic, and sociological implications of Black Nationalism in the United States. Particular atten- tion will be paid to the “masculine” nature of Na- tionalist discourse and the variety of ways women neg- otiate this terrain. (SP) Taylor

253A. Public Policy Analysis: Race and Culture in Domestic Policy. (4) Three hours of seminar per week. This course will focus on the issues of full employ- ment and multiculturalism as an approach to examin- ing the impact of race and culture on domestic policy. Our focus will be on the process of political innovation and agenda setting rather than the more traditional ar- eas of institutional decision-making and implementa- tion because it is usually at the formative stage that crucial decisions are made. (SP) Henry

253B. Public Policy Analysis II: Race and Culture in U.S. Foreign Policy. (4) Three hours of seminar per week. This course will explore the color line prob- lem (including women) stated by W.E.B. DuBois at the beginning of the 20th century from the context of the influence of race and culture on foreign policy. We will critically examine the major events of the 20th-century foreign policy and the role of African Americans in the policy process. The roles of W.E.B. DuBois and Ralph Bunche as representatives of ex- ternal and internal pressures on U.S. foreign policy will be highlighted. Other foci include the League of Na- tions, the United Nations, the Pan African Congresses, and the role of domestic groups like the UNIA, NAACP, TransAfrica, and the Council of African Af- fairs. (SP) Henry
Globalization and Caribbean Modernity. (4) Three hours of seminar per week. This seminar examines the social construction of the modern Caribbean subject under the transnationality of the Caribbean state, the localization of the globalization process. 

Racialization, Racisms, and Race: Concepts and Theories. (4) Three hours of lecture per week. The racialization problematic is employed in an examination of the concept of “race,” as they have been applied to people of African origin since slavery. Theories and concepts are evaluated in the social structure of the time in which they developed, as we assess how later types of theorizing incorporate problematic assumptions from previous generations. (F) Small 

Multiculturalisms. (4) Three hours of seminar per week. This seminar uses an epistemological and hermeneutic approach to locate and study the ethnic question in the U.S., Canada, and Europe. It examines the social construction of ethnicity and deconstructs it in relation to the gender and class positions of the subject. Modernist and postmodernist theories dealing with state formation and inter-ethnic relations will be scrutinized. National, transnational, and global aspects of ethnicity will be discussed. The technology of the internalized/externalized myth will be considered. (SP) 

Power, Domination, and Ideology. (4) Three hours of seminar per week. This seminar analyzes the social construction and reproduction of diasporic communities in the U.S., Canada, and Europe. It examines the role of the diaspora in the construction of the homeland in the context of the globalization process. The role of transnational migration and deterritorialization in the production of bipolar, fragmented, and multiple identities will be analyzed. Political consciousness and ethnic/cultural consciousness—differentially, transnational, and multicultural—will be assessed in light of poststructuralist theories. (SP) Lagueure 

Identity Politics in the Caribbean and Africa. (4) Three hours of seminar per week. This seminar examines the social construction and reproduction of diasporic communities in the U.S., Canada, and Europe. It examines the role of the diaspora in the construction of the homeland in the context of the globalization process. The role of transnational migration and deterritorialization in the production of bipolar, fragmented, and multiple identities will be analyzed. Political consciousness and ethnic/cultural consciousness—differentially, transnational, and multicultural—will be assessed in light of poststructuralist theories. (SP) Lagueure 

Power, Domination, and Ideology. (4) Three hours of seminar per week. This seminar analyzes the social construction and reproduction of diasporic communities in the U.S., Canada, and Europe. It examines the role of the diaspora in the construction of the homeland in the context of the globalization process. The role of transnational migration and deterritorialization in the production of bipolar, fragmented, and multiple identities will be analyzed. Political consciousness and ethnic/cultural consciousness—differentially, transnational, and multicultural—will be assessed in light of poststructuralist theories. (SP) Lagueure 

Ethnicity will be discussed. The technology of the internalized/externalized myth will be considered. (SP) 

Black Feminist Criticism. (4) Three hours of seminar per week. This course will focus on the development of a black feminist criticism(s). We will be specifically concerned with the writings of significant black women of the 20th and 21st centuries who have written in the tradition of class, race, and gender to analyze major issues of their time. (SP) 

Comparative Diaspora Discourses. (4) Four hours of seminar per week. The seminar investigates imitation, protest, and reformation of form in narratives produced by authors from East/West Africa and the Caribbean. Includes prose and drama written in African and European languages, Creoles, and pidgins from the 18th to 20th centuries. (SP) Clark 

Migrations of the Word. (4) Three hours of seminar per week. An examination of the conditions under which identity constructs (race, ethnicity, nation, religion, language, region, etc.) come to occupy the symbolic center in the organization of political movements in non-industrialized Third World societies. The course will be comparative in scope using case histories from Africa and the Caribbean. It will focus on the relationship between the ‘‘politics of identity,’’ national economic, class and race, and gender and the distribution of economic, social, cultural, and symbolic capital. (SP) Hintzen 

Power, Domination, and Ideology. (4) Three hours of seminar per week. This course will focus on theories and realities of power, domination, and ideology. It examines the issues of identity in the post-World War II political economies of Africa and the African diaspora. Hintzen 

International and Comparative ‘‘Race’’ and Ethnic Relations. (4) Three hours of seminar per week. This seminar examines the social construction and reproduction of diasporic communities in the U.S., Canada, and Europe. It examines the role of the diaspora in the construction of the homeland in the context of the globalization process. The role of transnational migration and deterritorialization in the production of bipolar, fragmented, and multiple identities will be analyzed. Political consciousness and ethnic/cultural consciousness—differentially, transnational, and multicultural—will be assessed in light of poststructuralist theories. (SP) Small 

Critical Race Theory. (4) Three hours of seminar per week. This course will engage the literature in critical race theory that has emerged over the past decade. The course will focus on people of African descent, but comparisons are made with other racialized and ethnic groups. (SP) Small 

Directed Dissertation Research. (1-8) Course may be repeated for credit. An interdisciplinary group and is open to students who have been advanced to candidacy for the Ph.D. degree and are directly engaged in doctoral dissertation research. (F,SP) Staff

Individual Study or Research. (1-4) Course may be repeated for credit. An interdisciplinary group and is open to students who have been advanced to candidacy for the Ph.D. degree and are directly engaged in doctoral dissertation research. (F,SP) Staff

Individual Study or Research. (1-4) Course may be repeated for credit. An interdisciplinary group and is open to students who have been advanced to candidacy for the Ph.D. degree and are directly engaged in doctoral dissertation research. (F,SP) Staff

Agricultural and Environmental Chemistry (College of Natural Resources)
Agricultural and Resource Economics

(College of Natural Resources)

Department Office: 207 Giannini Hall, (510) 642-3345
Chair: Anthony C. Fisher, Ph.D.

Professor: W. Michael Hanemann, Ph.D. Harvard University. Resource

Professor: J. Keith Gilless, Ph.D. University of Wisconsin, Madison.

Professor: Anthony C. Fisher, Ph.D. Columbia University. Natural

Professor: Peter Berck, Ph.D. Massachusetts Institute of Technology.

Instructor: Natural chemistry. (F,SP)

Unit.

The Agricultural and Resource Economics program stresses economic theory, quantitative methods, after which the student writes a dissertation. 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)

Course may be repeated for credit different topic varies. Two hours of seminar per week. Must be taken 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. Freshman seminars are offered in all campus departments; topics vary from department to department and semester to semester. (F,SP)

Upper Division Courses

100. Microeconomic Theory with Application to Natural Resources. (4) Students who have taken Econ 100A, Econ 101A or Bus Adm 110 will receive only 2 units of credit for 100. Three hours of lecture and one hour of discussion per week. Prerequisites: Environmental Economics and Policy 1 or Economics 100A. (F,SP)

101. Environmental Economics. (4) Students will receive no credit for 101 after taking Economics 125, 3. Three hours of lecture and one hour of discussion per week. Prerequisites: Math 16A or 16B and consent of instructor. Covers the basic microeconomic tools for further study of natural resource problems. Theory of consumption, production, theory of the firm, industrial organization, general equilibrium, public goods and externalities. Applications to agriculture and natural resources. (F)

102. Natural Resource Economics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Math 16A or 16B and Environmental Economics and Policy 100, or Economics 100A or 101A. Theories of externalities and public goods applied to pollution and environmental policy. Trade-off between production and environmental policy. Assessing nonmarket value of environmental amenities. Remediation and clean-up policies. Environment and development. Biodiversity management. (SP)

115. Modeling and Management of Biological Resources. (4) Three hours of lecture per week and ad-hoc microcomputer laboratory meetings. Prerequisites: Two semesters of calculus and consent of instructor. Models of population growth, chaos, life tables, and Leslie matrix theory. Harvesting and exploitation theory. Methods for analyzing population interactions, predation, competition, fisheries, forest stands, and insect pest management. Genetic aspects of population management. Mathematical theory based on simple difference and ordinary differential equations. Use of simple models. (F,SP)

111. Methods in Agricultural Economics. (4) Three hours of lecture per week and ad-hoc microcomputer laboratory meetings. Prerequisites: Two semesters of calculus and consent of instructor. Models of population growth, chaos, life tables, and Leslie matrix theory. Harvesting and exploitation theory. Methods for analyzing population interactions, predation, competition, fisheries, forest stands, and insect pest management. Genetic aspects of population management. Mathematical theory based on simple difference and ordinary differential equations. Use of simple models. (F,SP)
118. Introductory Applied Econometrics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 16A-16B and Stat 131A or equivalent. Single equation regression models; hypothesis testing; econometrics applicable to agricultural and resource issues. (F)

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 formation, implementation, and impact of public policies affecting agriculture and the environment. Economic approaches to public law-making, including theories of legislation, interest group activity, and congressional control of bureaucracies. Case studies include water allocation, endangered species protection, water quality, food safety, drainage, wetlands, pesticides, and farmer safety. Emphasis is on examples from California. (F)

142. Industrial Organization of Agricultural, Food, and Fiber Markets. (3) Three hours of lecture per week. Prerequisites: 100 or Economics 100A or 101A; Organization, conduct, and performance of agricultural and resource markets. Private and public institutions that support and serve them, including federal and state programs and policies. Case studies to demonstrate different market conditions and arrangements, emphasizing the interaction of markets and public policy. (SP)

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

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. Special attention paid to the importance of risk. Economic analyses of savings, consumption, insurance, production, trade, welfare distribution, and institutions of villages in developing countries. Highly equal parts of theory, evidence, and policy. (SP)

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; 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 environmental and extractive 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; recommended. Urban demand for water; water supply and economic growth; water utility economics; irrigation demand; large water projects; economic impacts of surface water law and institutions; economics of salinity and drainage; economics of groundwater management. (SP)

195. Senior Thesis. (4) Course may be repeated for credit. Individual meetings with faculty sponsor. Prerequisites: Senior standing in Environmental Economics and Policy, consent of instructor. Writing of a thesis under the direction of member(s) of the faculty. Subject must be approved by faculty sponsor. (F,SP)

H196. Honors Research. (4) Course may be repeated for credit. Individual research or meetings with faculty supervision. Prerequisites: Upper division standing and a minimum 3.2 GPA. Eligibility restrictions related to GPA and unit accumulation. Open only to Environmental Economics and Policy majors. Supervised independent research specific to aspects of environmental economics and policy, followed by a written report to the department. (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 Curriculum section of this catalog. Independent study. 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. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

198. Directed Group Studies for Advanced Undergraduates. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curriculum section of this catalog. Meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Group study of selected 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 Curriculum section of this catalog. Independent meetings. 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 to pursue special study and directed research under the direction of a member of the staff. (F,SP)

Agicultural and Resource Economics

201. Production, Industrial Organization, and Regulation in Agriculture. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 101A or equivalent or consent of instructor. Basic concepts of micro and welfare economics; partial and general equilibrium. Industrial organization: monopoly, oligopoly, vertical domination and integration, price fixing, price discrimination, and the economics of information with applications to food retailing, cooperatives, fishing, and energy. (F)

202. Issues and Concepts in Agricultural Economics. (4) Three hours of lecture, and one hour of discussion per week. Prerequisites: Economics 101A or consent of instructor. History, institutions, and policies affecting agriculture markets and environmental quality. Producer behavior over time and under uncertainty. Asset fixity and agricultural supply models. (SP)

211. Econometrics: Statistical Foundations and Single Equations. (4) Four hours of lecture and two hours of discussion per week. Prerequisites: Economics 201A-201B or consent of instructor. History, institutions, and policies affecting agriculture markets and environmental quality. Producer behavior over time and under uncertainty. Asset fixity and agricultural supply models. (SP)

211. Econometrics: Statistical Foundations and Single Equations. (4) Four hours of lecture and two hours of discussion per week. Prerequisites: Economics 201A-201B or consent of instructor. History, institutions, and policies affecting agriculture markets and environmental quality. Producer behavior over time and under uncertainty. Asset fixity and agricultural supply models. (SP)

211. Econometrics: Statistical Foundations and Single Equations. (4) Four hours of lecture and two hours of discussion per week. Prerequisites: Economics 201A-201B or consent of instructor. History, institutions, and policies affecting agriculture markets and environmental quality. Producer behavior over time and under uncertainty. Asset fixity and agricultural supply models. (SP)

212. Econometrics: Multiple Equation Estimation. (4) Four hours of lecture and two hours of discussion 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 nonparametric analysis. 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 lab per week. Prerequisites: 211, 213 or equivalent or consent of instructor. Theory and application of new and emerging approaches to estimation and inference. Bayesian and maximum likelihood approaches to estimation and inference. Methods of accounting for overidentification and underidentification in the empirical models of trade. Market structure considerations in international trade. (F)

238. Markets and Trade 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 faculty, staff, and students. Not necessarily offered every semester. (F,SP)

241. Agricultural Policy. (3) Three hours of lecture per week. Prerequisites: 201 and 202, or Economics 201A-201B, or consent of instructor. Agricultural policy problem, development and less developed economies. Effects of shocks on dynamic behavior of markets. Welfare evaluation methodology and applications to policy interventions (research, price supports, market stabilization, environmental regulations, carbonization) and implications for efficiency and distribution. (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. Three failure types are distinguished: market, government, and organizational. The roles of public versus private interests are modeled to determine degree and extent of organizational failures in collective group behavior. Alternative frameworks are used to evaluate various types of policy reform. (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. Agriculture in Economic Development. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Alternative development strategies and the relationship between macroeconomic and agricultural policies. Price and nonprice instruments in government interventions. Agrarian institutions: household behavior and contracts. The political economy of policy reform. Emphasis is placed on formal economic analysis. (F)

252. Sectoral and Regional Planning in Economic Development. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Analysis of policy issues in agricultural development using sectoral and regional models of growth and development. (SP)

259. Rural Economic Development Workshop. (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. Presentation and criticism of ongoing research by faculty, staff, and students. Not necessarily offered every summer. (F,SP)

261. Natural Resource Economics. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Methods of dynamic optimization. Theory of optimal management of renewable and nonrenewable resources. Applications to fisheries, forests, and minerals. Impacts of alternative tax and market structures on patterns of depletion. Economics of conservation. Resources, growth, and sustainability. (F)

262. Environmental Economics. (3) Three hours of lecture per week. Prerequisites: Economics 201B. Agricultural economic theory of pollution control regulation under uncertainty and uncertainty. Issues in current pollution
American Studies

(College of Letters and Science)

Group Major Office: Division of Undergraduate and Interdisciplinary Studies, 301 Campbell, (510) 642-9320 http://www.ls.berkeley.edu/dept/as
Director: Ron Loewinsohn, Ph.D.
Faculty Advisers: A list of faculty advisers is available in the major office or on the web site
Student Affairs Officer: Marianne Callum

Affiliated Faculty
Norma Alarcón (Chicano Studies)
Charles Allen (English)
Julia Bader (English)
Arthur Blaustein (City and Regional Planning)
Mitch Breitwieser (Economics)
Earl F. Chet (Business)
Jack Citrin (Political Science)
Ferdinand Dolan (Rhetoric)
Robin L. Einhorn (History)
Claude S. Fischer (Sociology)
Thomas Goggin (Medicine)
Paul Groth (Archeology)
Dorothy Hale (History)
J. Sara Hall (American Studies)
Bob Hass (English)
Charles P. Henry (African American Studies)
Donald Hollinger (History)
Richard Hutson (History)
Michael Omi (Asian American Studies)
Katherine Snyder (American Cultures)
Hsieh Wen Shen (History)
Christine Rosen (English)
Michael Reich (Economics)
Samuel Otter (History)
Robert Oster (History)
Michael Rogin (History)
Hertha Wong (History)
Ling-chi Wang (History)
Richard Walker (History)
Dell Upton (Interdisciplinary Studies)
Magaretta Lovell (Art History)
Judy Meidell (History)
Robert McNamara (History)
Judith Innes (City and Regional Planning)
Karen Kaplan (Women’s Studies)
Michel S. Laguerre (African American Studies)
Thomas C. Leonard (Journalism)
Keni Lightt (Sociology)
Ron Loewinsohn (English)
Margaretta Lovell (Art History)
Colleen Lye (English)
Jabari Mann (History)
Waldo Martin (History)
Mary Ann Mason (Law and Social Welfare)
Joe McBride (Environmental Science, Policy, and Management)
Donald McGuade (English)
Kathleen Moran (Interdisciplinary Studies)
Christopher Nealon (English)
Michael Omi (Asian American Studies)
 Samuel Otter (History)
Genaro Padilla (English)
Carolyn Porter (English)
Michael Reich (Economics)
Jean Retzinger (Mass Communications)
Michael Rogin (Political Science)
Christine Rosten (Business)
Mary Ryan (History)
Jose Saldívar (Ethnic Studies)
Alex Saporiti (Chemistry)
Susan M. Schwerk (English)
Hsiun Wien Shen (Civil Engineering and Environmental Engineering)
Eric Smoodin (Film/Rhetoric)
Katherine Snyder (English)
Carol Stack (Women’s Studies)
Ann Swidler (Sociology)
Dell Upton (Interdisciplinary Studies)
Fernando E. Viteri (Nutritional Sciences and Toxicology)
Gerald Viziron (Native American Studies)
David J. Vogel (Business)
Kim Vois (Sociology)
Richard Walker (Interdisciplinary Studies)
Lim-ching Wang (Asian American Studies)
Lewis Watts (Architecture)
Hertha Wong (English)
Alex Zwierling (English)

Lower Division Requirements. A minimum grade of "C" is required in all lower division courses taken for the major. The lower division requirement consists of American Studies, (AB) 150A, (AB) 150B, and American Studies (4 units), plus three courses from the following list of courses, with no more than two courses from any one department.

Note: This list is subject to annual review and revision. New courses, particularly those that are related to the American Cultures, requirement, can be substituted for those on the list with adviser approval. Transfer students should check with an AS adviser to have their lower division courses approved to fulfill this requirement.

Lower Division Course List:
American Am Studies 1A, 1B, 5A, 5B, 17AC, 20, 27AC; Agricultural and Resource Economics 1 and 2AC; Anthropology 2, 10AC, 11AC, 16, 17; Asian Am Studies 2A, 2B, 20A, 20B, 20C; Business Administration 10; Chicano Studies 1A, 1B, 20, 30, 40, 50, 70, 80; Comparative Lit 25B, 56; Education 40AC; English 30AW, 30BW, 31AC, 37; Environment Design 4; 71; ESPM 10, 11, 50; Environmental Sciences 2AC, 24AC; Geography 20; History 7A, 7B, 16AC, 17A, 17B, 30B; IDS 1; Journalism 39AC; Landscape Arch 10; Linguistics 55AC; Mass Comm 10; Military Affairs 1, 2; Music 26A; Native Am Studies 1A, 1B, 71, 71; Poli Sci 1, 33AC; Public Health 14; Social Welfare 20AC; Sociology 1, 3, 3AC; Women’s Studies 12, 14, 20, 20W.

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

1. Core Courses. (8 units) American Studies 101, Examinations in the Arts and Sciences in Time, and American Studies 102. Examinations in U.S. Cultures in Place. It is expected that these courses will be completed during the junior year.

2. Area of Concentration. At least 20 units of upper division course work 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 focus, prior preparation, and the availability of courses. Therefore, students planning to declare the major should meet with a faculty adviser in their junior year. No later than the start of their upper division program, the student is expected to declare a major and to consult with a faculty adviser to have their upper division program approved. The upper division requirements include at least 12 units of coursework that must be completed with grades of “C” or better.

3. Thesis Requirement. All majors are required to satisfy a senior thesis requirement in American Studies in which they write a substantial research paper. There are three ways to satisfy the requirement:

a. Students enroll in American Studies 191, The Senior Seminar. This course will focus on topics or issues in American studies appropriate to students’ areas of concentration. Students will meet in seminars and will be required to write individual research papers based on the general themes or issues of the seminars. Topics will vary.

b. Students enroll in American Studies 190, The Senior Thesis. Students who choose this option must prepare a bibliography and write a brief description of their proposed thesis the semester before they plan to enroll in 190. They also must secure a faculty adviser from an appropriate field who will agree to direct the thesis. They must then submit their proposal, along with the signature of their faculty director, to the American Studies Office to obtain a course control number.

c. Students enroll in an upper division seminar in a department or field appropriate to their area of concentration.
101. Examining U.S. Cultures in Time. (3) Course may be repeated for credit as topic varies. Three to four hours of lecture per week. This course is designed primarily for freshmen. It will focus on interdisciplinary courses which address specific issues, themes, or problems in American society. Topics vary from semester to semester. Students should consult the department's webpage for current offerings well before the start of the semester. (F.SP) Staff

C132B. Intellectual History of the United States. (4) Students will receive no credit for C132B after taking History 132B. Three hours of lecture and one hour of discussion per week. History C132B. (F.SP) Hollinger

C136. American Studies. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. A course on the intellectual, cultural, historical, and social backgrounds to American literature. Topics will vary from semester to semester. Students should consult the department's webpage for current offerings well before the start of the semester. Also listed as English C136.

C169A. History of the U.S. Cultural Environment, 1783-1900. (3) Three hours of lecture and two hours of discussion per week. The evolution and interpretation of American everyday homes, highways, farms, stores, and recreation areas—with an emphasis on how to read the landscape as a record of social and cultural processes. Also listed as Geog C169A and Austin C169A.

C169B. History of the U.S. Cultural Environment, 1900-1970. (3) Three hours of lecture and two hours of discussion per week. The evolution since 1900 in the form and meaning of rural and urban landscapes, and how to read them as records of social and cultural processes. Also listed as Geography C160B and Environmental Design C169B.

C172. Business in Its Historical Environment. (3) Three hours of lecture per week. This course will examine selected aspects of the history of American business. Included will be discussions of the evolution of the large corporation, the development of modern managerial techniques, and the changing relationship of business, government, and labor. Also listed as Business Administration C172. (F.SP)

C173. Cultures of U.S. Imperialism: Spanish-American War of 1898. (4) Three hours of lecture and one hour of discussion per week. This survey course explores the histories and narratives of the Spanish-American War of 1898. Did the war initiate new kinds of affiliations to and with the U.S.? invaded Cuba, Puerto Rico, and the Philippines? Readings by Turner, Azulaka, Roosevelt, Martí, Rizal, Retamor, Montejo, and Perez, among others. Also listed as Ethnic Studies C173. (F.Saldivar)

C174. 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." The course aims to help students become conversant with the elements of alphabetic literacy (reading and writing) and visual literacy (observing and making images) in order to develop a third distinctive "visual/visual" literacy. Also listed as Visual Studies C185A, Undergraduate Interdisciplinary Studies C135, and English C143V. This course satisfies the American cultures requirement.

C176. The American Forest: Its Ecology, History, and Representation. (3) 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 scientific, historical, and literary texts. This examination seeks to understand the forest in its scientific and economic parameters, as well as the historic, social, and ideological dimensions which have contributed to the evolution of our representations of the forest. Also listed as Undergraduate Interdisciplinary Studies C136, History of Art C189, and Environ Sci, Policy, and Management C191. Lovell, McBride

C177. Journalistic Perspectives on American Culture. (3) Three hours of lecture per week. Journalistic perspectives on American culture is the study of family defined by the dominant media in society. Students will examine both primary and secondary sources to see how the reputations of individuals have been built and torn down. Also listed as Journalism C177. (F.SP) Leonard

C178B. Vernacular Architecture. (3) Three hours of lecture per week. Prerequisites: Architecture 170A-170B. This course will introduce you to a variety of North American vernacular building traditions, to help you understand how people who have traditionally trained as architects design and build, how buildings and landscapes are used, and what they mean to their builders and users. Topics to be explored include rural and urban house types, vernacular building systems, commercial architecture, the public landscape, and the vernacular landscapes of work and of religion, focusing on European, African, and Native American traditions that shaped the most familiar and widespread folk architectures, as well as on the urban landscapes of 19th- and 20th-century immigrants. We will look at built environments as expressions of ethnic and social identities, organized, and conscious works of art. Also listed as Architecture C174B. This course satisfies the American cultures requirement.

190. Senior Thesis. (4) Individual meeting with the thesis advisor. All American Studies majors must satisfy the senior thesis requirement. Three options are available: AS 190 Senior Thesis, AS 191 Senior Seminar, or students may (with prior Faculty Advisor approval) enroll in an upper division seminar会对接车不给到其-year during which the thesis is written. (F.SP) Staff

191. Senior Seminar. (4) Four hours of seminar per week. Prerequisites: Declared majors with senior standing. Students will meet in seminar 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

H195. Honors Thesis. (4) Individual conferences. Prerequisites: Senior-standing major in American studies; completion of 101 and 180A, 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 concentration within the American studies major. The completed thesis will be read by the thesis supervisor and one other faculty member. (F.SP) Staff

Ancient History and Mediterranean Archaeology

(Yearly Letters and Science)

Group Major Office: 7303 Dwinelle Hall, (510) 643-6741
http://as.berkeley.edu/Dept/AHMA/

Professors
Guilty Azaray, Ph.D. University of California, Berkeley. Near Eastern art history
Daniel Boyarin, Ph.D. Jewish Theological Seminary. Rabbinic literature, Talmudic culture
Stanley H. Brandes, Ph.D. University of California, Berkeley. Mediterranean ethnology
Hollinger
Crawford H. Greenewalt, Jr., Ph.D. University of Pennsylvania. Classical Archaeology
Leslie V. Kurke, Ph.D. Princeton University. Greek literature
Crawford H. Greenewalt, Jr.

Ancient History and Mediterranean Archaeology
take considerable seminar work in at least two of the departments represented in the program and obtain some practical experience in archaeology. Candidates must pass examinations in two modern languages and two ancient languages appropriate to the fields of study. They are then eligible for the Ph.D. qualifying examinations, both written and oral, which test the depth of their understanding of two major and minor subjects. Upon successful completion of these requirements and when advanced to candidacy, the student proceeds to research and writing of a dissertation under the guidance of a three-person committee. The dissertation must be approved by the committee and be in a final form before the student is recommended for the Ph.D. degree.

For further information, inquiries should be addressed to the Graduate Committee in Ancient History and Mediterranean Archaeology.

Graduate Courses

210. Ancient History and Mediterranean Archaeology Interdisciplinary Seminar. (2,4) Course may be repeated for credit. Three hours of seminar 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 enrollment, directed study, or dissertation. Graduate standing or consent of instructor. Topics and instructors will vary from year to year. Special individual study for qualified graduate students. Individual study and research, including archaeological fieldwork or laboratory projects, in consultation with instructor on subject matter not covered in scheduled course offerings. (F,SP) Staff

The Major

There is no undergraduate major.

The Graduate Program

The Ancient History and Mediterranean Archaeology program is interdisciplinary and is administered by a group drawn from different departments. Both M.A. and Ph.D. degrees are offered. Fields of emphasis include Classical, Near Eastern, Ancient Egyptian, and Late Antique history, religion, art and archaeology; epigraphy; numismatics; and ancient law. Candidates for degrees will offer a combination of three of these fields or similar fields, one as a major subject, two as minor subjects. The program is open to students from all disciplines who have completed at least one year of graduate study in ancient history, art, or archaeology. Applicants should have had sufficient training to undertake advanced work in at least one ancient language.

M.A. Requirements. The M.A. by thesis requires 20 semester units of course work and a thesis. The M.A. by examination requires 24 semester units of course work. Students may elect to have the examination in the area of principal specialization. All M.A. candidates must pass an examination in at least one (normally modern) language before the degree is awarded. Each student's progress is monitored by a three-person advisory committee. Students are expected to complete requirements for the M.A. within two years after admission. Successful completion of the program is required for any student admitted into the Ph.D. program. Students must petition the faculty and obtain its approval before continuing for the Ph.D.

Ph.D. Requirements. There are no specific course requirements. It is expected that all students will take at least one AHMA interdisciplinary seminar during their graduate years. Students should also take courses in relevant fields to achieve a broad and sophisticated background. The program is open to students with a broad range of interests. Students must satisfy the following requirements: 20 semester units of course work, a comprehensive examination, and a dissertation. The dissertation may be based on original research or on a critical study of a significant body of literature.

Anthropology

(An undergraduate option is available. Students interested in anthropology who are not pursuing a degree in the field should consult the Department for information on the minor program in anthropology.)

Department Office: 322 Kroeber Hall, (510) 643-3391
http://www.personalweb.com/anthropology

Visiting Professor
Victor R. Gold, Ph.D. Semitic languages, Syro-Palestinian history and archaeology

Senior Staff
Frank Asaro, Ph.D. University of California, Berkeley. Provenance determination of archaeological artifacts

Assistant Professor
Marian Feldman, Ph.D. Harvard University. Bronze Age Aegean and Near East art and archaeology

Phoebe A. Hearst Museum of Anthropology are housed in Kroeber Hall.

Assistant Professors

Laurence Cohen, Ph.D. Harvard University. Medical anthropology, sexuality, gerontology, religion, South Asia
Christine Hastorf, Ph.D. University of California at Los Angeles. Archaeology, food and agriculture, political complexity, gender, paleoecological change, Andes
Rosemary Joyce, Ph.D. University of Illinois, Urbana. Settlement patterns, symbolism, complex societies, ceramics, Central America

Assistant Professors

Marianne Ferme, Ph.D. University of Chicago. Social/cultural and gender theory, symbolic and cultural anthropology, colonialism, West Africa, contemporary Western Europe
Junko Habu, Ph.D. McGill University. Religion, arcane knowledge, theory, social and cultural theory, gender, power, theoretical anthropology

Assistant Professors

Nancy Scheper-Hughes, Ph.D. Anthropology, social migration, politics, religion, Africa

Eugene A. Hammel, Ph.D. University of California, Berkeley. Evolution, biotechnology, behavior, variation

J. Michael bub, Ph.D. Harvard University. Social anthropology, North America

Associate Professors

Lawrence Cohen, Ph.D. Harvard University. Medical anthropology, sexuality, gerontology, religion, South Asia
Christine Hastorf, Ph.D. University of California at Los Angeles. Archaeology, food and agriculture, political complexity, gender, paleoecological change, Andes

Professor

Donald S. Moore, Ph.D. Stanford University. Environmental politics, development, space, place, and identity; cultural politics; Africa

Assistant Professors

Aihwa Ong, Ph.D. Columbia University. Cultural politics, gender, globalization, China, Africa

Professor

Nancy Scheper-Hughes, Ph.D.

Associate Professor

Lawrence Cohen, Ph.D.

Department Overview

The Department of Anthropology offers students the opportunity to study human culture from the broadest historical and geographical perspective. Courses in the department introduce students to all aspects of social and cultural aspects of behavior, as well as the physical nature of humans. Lower division courses are intended to give a general 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: to provide a general education in anthropology for students who are pursuing a liberal arts education, and 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 select a combination of courses to form a unified plan of study that meets special intellectual interests.

Undergraduate students, both majors and non-majors, seeking information or advice about their programs or about courses should inquire at 209 Kroeber Hall.

The collections and research facilities of the Phoebe A. Hearst Museum of Anthropology are
available for study in archaeology, ethnography, physical anthropology, and related subjects by graduate and undergraduate students, and by visiting scholars; the museum’s exhibits are used for instructional and educational purposes, particularly in connection with class work. Those interested may address the Director, 103 Kroeber Hall.

For further information on the Hearst Museum, see the Index.

The Anthropology Library, 230 Kroeber Hall, is part of the campus library 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 serves primarily the faculty and students of the Anthropology Department.

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 Minor

Lower Division Prerequisites: Anthropology 1, 2, and 3 or 3AC.

Upper Division Requirements: A total of nine upper division courses is required. Anthropology 114 (taught only in fall semesters) One course in physical anthropology (courses 100-112) One course in archaeology (courses 121-136, and 174AC) One course in social/cultural anthropology (courses 115-119, 137-189) Five other elective anthropology courses. The above nine courses must include at least one "area" course (121-124, 170-188), and one "method" course (131-135, 138B, 141). For example, Anthropology 123D, Archaeology of East Asia, is an area course that is also upper division archaeology. Method courses must be taken for a minimum of 4 units. Summer field courses, when sponsored or endorsed by a Berkeley professor of Anthropology, satisfy the method requirement. All courses must be taken on a letter-graded basis with the exception of Anthropology 199. Independent study, if sponsored and evaluated by a professor of anthropology. Transfer students should attempt to satisfy prerequisites before transferring to Berkeley. Students may declare the major when they have completed at least 30 semester units, and should declare when they have completed 60. They may declare when they have completed two of the prerequisites and are enrolled in the third. Honors Program. The Honors Program in anthropology is an independently pursued course of research undertaken by qualified students under the mentorship of a faculty advisor. A grade-point average of 3.3 overall, and 3.5 in the major in courses completed at Berkeley is required to qualify for the program. It is a year and a half-year-long program which 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, H119A and H195B, may also count as elective requirements for the major. Applications and more information are available at 209 Kroeber Hall.

The Minor

Lower Division. Choose two from Anthropology 1, 2, or 3/3AC.

Upper Division. Any five anthropology courses. All courses must be taken for a letter grade, and the student must achieve a C average in all anthropology course work. Students must bring a Petition for Confirmation of Minor Program Completed and an unofficial transcript to 209 Kroeber Hall by the 12th week of the final semester.

Preparation for Graduate Study

Admission to graduate studies at Berkeley does not presuppose an A.B. 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 a stepping stone 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 and archaeology. The Ph.D. in anthropology is concerned with diverse analytic and substantive problems in the contemporary world and includes seminars on 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 anthropology; genomics and the anthropology of science and reason; folklore theory; ethnological-linguistic anthropology; paleo-ethnobotany; the anthropologies of place and energy, space, and the body; sexuality and difference; aging and the life course; cultural politics of identity, space, and the body; political ecology and agrarian micropolitics; coastal and maritime American anthropology and psychoanalytic anthropology.

The program for the Ph.D. degree normally takes six years and is divided into three steps, as follows:

Step I. The students begin to narrow down their interests to particular topical and geographical fields of specialization, a process that normally takes one year.

Step II. Students attend seminars, prepare three field statements in their specializations, satisfy their language requirement, and prepare for their Ph.D. oral qualifying examination. This step lasts one to two years. With the successful passing of the orals, students are advanced to candidacy for the Ph.D. degree.

Step III. 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, which generally takes 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.

For further information, please address correspondence to the Graduate Adviser, Department of Anthropology, University of California, Berkeley; Berkeley, CA 94720.

Medical Anthropology Ph.D. Program

General Information. The Department of Anthropology is concerned with diverse analytic and substantive problems in the contemporary world and includes seminars on 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 anthropology; genomics and the anthropology of science and reason; folklore theory; ethnological-linguistic anthropology; paleo-ethnobotany; the anthropologies of place and energy, space, and the body; sexuality and difference; aging and the life course; cultural politics of identity, space, and the body; political ecology and agrarian micropolitics; coastal and maritime American anthropology and psychoanalytic anthropology.

The program for the Ph.D. degree normally takes six years and is divided into three steps, as follows:

Step I. The students begin to narrow down their interests to particular topical and geographical fields of specialization, a process that normally takes one year.

Step II. Students attend seminars, prepare three field statements in their specializations, satisfy their language requirement, and prepare for their Ph.D. oral qualifying examination. This step lasts one to two years. With the successful passing of the orals, students are advanced to candidacy for the Ph.D. degree.

Step III. 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, which generally takes 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.

For further information, please address correspondence to the Graduate Adviser, Department of Anthropology, University of California, Berkeley; Berkeley, CA 94720.

Medical Anthropology.

Medical Anthropology entails the exploration of humans as simultaneously physical and social 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 successful and applied significance, and with research that is of relevance to the social sciences as well as to medicine and the biological sciences. The medical dimensions of disease are accompanied by semiotics 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 systems) 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.

Given the broad definition of medical anthropology, the joint graduate program at Berkeley-UCSF is extremely flexible, allowing for the individual needs and interests of each student. During the first year of training, students are required to take core courses in both sociocultural and biological aspects of medical anthropology, taught at both campuses. After the first year and successful completion of the preliminary qualifying examination, medical anthropology students develop a more specialized and individually tailored program under the supervision and guidance of their advisor.

For students entering Berkeley with a B.A., the doctoral program is estimated to take between five and six years, as follows: three years of course work, one to two years of dissertation research, and one to two years of writing the dissertation.

For a complete list of faculty, consult the Medical Anthropology brochure available from the Program Office, 333 Kroeber Hall, Berkeley, CA 94720-3710, or the General Catalog of UCB and UCSF campuses.

Applications to all graduate programs are considered once each year for admission 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 UCSF program in medical anthropology requires a master’s degree in anthropology or a master’s degree, or a post-baccalaureate professional degree.

The 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 Physical Anthropology. (4) Three hours of lecture and one hour of discussion per week.

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R&C requirement
AG suffix=course satisfies American cultures requirement
†Recipient of Distinguished Teaching Award
An introduction to human evolution, physical and behavioral adaptations of humans and their prehistoric and living relatives. Issues in evolutionary theory, molecular evolution, primate behavior, interpretation of fossils. Prehistoric activities, racial differences, genetic components of behavior are defined and evaluated. (F,SP)

2. Introduction to Archaeology. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: Concurrent enrollment in 2. A supplemental course in which students are introduced to multimedia authoring for archaeology and the multimedia presentation of archaeology through commercial and educational web sites and CD ROMs. (F,SP) Tringham

3. Introduction to Social and Cultural Anthropology. (3) Three hours of lecture and one hour of discussion per week. The structure and dynamics of human culture and social institutions. (F,SP)

3AC. Introduction to Social/Cultural Anthropology (American Cultures). (4) Three hours of lecture and one hour per week. The structure and dynamics of human cultures and social institutions from a comparative perspective with special attention to American cultures and their roots. Case studies will illustrate the principles presented in the course. It fulfills the requirements for 3. This course satisfies the American cultures requirement. (F,SP)

10AC. The California Frontier. (4) Three hours of lecture and one hour of discussion per week. This course will focus upon the beginning of the historic period in California and on the interactions between California Indians and colonizing peoples. The course will begin with an introduction to the indigenous peoples of California and to their contacts with the expanding world systems. It will focus upon the Spanish, Mexican, Russian, and American periods and will conclude with an overview of how these several communities, colonizer and colonized, interacted with and shaped one another. This course satisfies the American cultures requirement. (F,SP)

11AC. Humor in America: Cross-Cultural Perspectives. (3) Two hours of seminar per week. This seminar explores social scientific approaches to ethnic humor, especially as applied to American cultures. The seminar covers three major domains: (1) sources of ethnic humor; (2) types of ethnic humor; and (3) impact of ethnic humor on individuals and groups. We shall discuss how the differences among the following five major ethnic groups: African-Americans, Asian-Americans, Native Americans, Chicano/Latinos, and Euro-Americans. This course satisfies the American cultures requirement. (F,SP)

12AC. Anthropological Views of American Cultures. (3) Two hours of seminar per week. Prerequisites: Limited to freshmen and sophomores. Consent of instructor. The seminar will examine anthropologists’ research and writing on American cultures (American, American Indian, Asian American, Chicano/Latino, European American, and people of mixed heritages) plus intercultural relationships. Each student will focus on two culture categories, to discover how anthropologists examine cultural diversity. Prerequisites: vary from department to department and semester to semester. Enrollment limited to 15 freshmen.

39. Freshman/Sophomore Seminar. (2-4) Course may be repeated for credit when topic changes. One hour of lecture per unit. Sections 1-2 to be graded on a pass/no pass basis. Freshman and sophomore seminar 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.

98. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curriculum section of this catalog. Three to twelve hours of group study (or tutorial or fieldwork) per week. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor; freshmen or sophomore status. Organized group study on topics selected by lower division students under the sponsorship and direction of a member of the Anthropology Department’s faculty.

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 to twelve hours of tutorial (or fieldwork) per week. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor; freshmen and sophomores only. Individual research by lower division students. (F,SP)

Upper Division Courses

Physical Anthropology

C100. Human Paleontology. (5) Three hours of lecture and three hours of laboratory per week. Prerequisites: 1; Biology 1A-1B. Origin and relationships of the extinct forms of mankind. Also listed as Integrative Biology C185. (SP) White

101. Human Variation in an Evolutionary Perspective. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1. Human variation in both a racial and non-racial context; basic genetics (both molecular and populational); theories of racial origins, selective bases of human variation. (F,SP)

C103. Introduction to Human Osteology. (6) Six hours of lecture and fourteen hours of laboratory per week. Prerequisites: Anthropology 1, Biology 1B. An intensive study of the human skeleton, reconstruction of individual and population characteristics, emphasizing methodologies and analysis of human populations from archaeological contexts; introduction to use of statistics in osteological analysis. Also listed as Integrative Biology C142. (SP) White

105. Primate Evolution. (5) Three hours of lecture and three hours of laboratory per week. Prerequisites: 1. A consideration of the major groups of primates with an emphasis on the evolution of behavior.

106. Problems in Primate Behavior and Ecology. (4) Three hours of lecture per week. Special problems in primate behavior and ecology, such as ecological adaptation, socialization and the biological bases of behavior. (F,SP)

109. Dietary Anthropology. (4) Three hours of lecture per week. This course focuses on different aspects of the human diet seeking insight into factors related to patterns of food selection, diet breadth, food avoidance, and variation in behavioral and physical aspects of diet with respect to food, body politics, dietary politics, food festivals, folklore of food, etc. In the first few lectures brief mention will be made of the nature of food itself and some attention will be paid to the dietary patterns of non-human primates and the probable diet of early humans. (F,SP)

112. Special Topics in Biological Anthropology. (4) Course may be repeated for credit. Three hours of lecture per week. May be offered in case more students, or more in-depth study of the material, becomes available. Prerequisites: Consent of instructor.

History of Anthropology

114. History of Anthropological Thought. (4) Three hours of lecture and one hour of discussion per week. Formerly 114A. This course will present a history of anthropological thought from the 19th century to the present, and will draw upon the major 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. (F)

Medical Anthropology

115. Introduction to Medical Anthropology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Cultural, psychological, and biological aspects of the definitions, causes, symptoms, and treatment of illness. Comparative study of medical systems, practitioners, and patients. (F,SP)

117. The Anthropology of Aging and the Life Course. (4) Three hours of lecture per week. Prerequisites: 3 is recommended. An anthropological approach to the study of age and aging and of the different periods of the life course: birth, infancy, childhood, youth and adolescence, adulthood and middle age, old age, and dying. How might we think—about time, the body, and what it means to talk about life—through a focus on age. (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, biomedical and applied approaches to medical anthropology. (F,SP)

Archaeology/Area

121. Historical Archaeology. (4) Three hours of lecture per week. Prerequisites: 2 or consent of instructor. Formerly 121. 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. May be repeated for credit when a different focus is offered. American, and Native American examples are considered. (F,SP)

121B. Theoretical Approaches in American Historical Archaeology. (4) Three hours of lecture per week. Prerequisites: 2 or consent of instructor. This course will provide a background in the theoretical and methodological development of American historical archaeology, with particular emphasis on the ways in which archaeologists have approached the integration of archaeological, documentary, oral historical and ethnographic data. Emphasis on continuing theoretical developments in the discipline. Politics of historical archaeology, and in ways in which historical archaeologists and other public historians make the past relevant to the present. (F,SP)

121C. Historical Artifact Identification and Analysis. (4) Two hours of lecture and three hours of laboratory per week. Prerequisites: 121A or 121B recommended and consent of instructor. Learn to work with historical artifacts from the stage of recovery through the stages of analysis and interpretation. The focus is on the analysis of materials (i.e., ceramic, glass, metal, bone, shell artifacts) recovered from historic sites. Skills acquired include how to identify, date, record, illustrate, photograph, catalog, and interpret historical archaeological materials through a combination of lectures, lab exercises, and a research project. (F,SP)

122. New World Cultures. (4) Three hours of lecture per week. Prerequisites: 2, except 122D which has no prerequisites. A variety of courses that consider the peo-
122A. Archaeology of North America. (4) Prerequisites: 2. Formerly 122. Prehistory of North American Indians; prehistoric culture areas; relations with historic Indians. (F,SP)

122B. Culture Contact in North America. (4) Three hours of lecture per week. This course examines the implications of early encounters between Native Americans and Europeans, including how indigenous peoples responded to European contact and colonialism, and how strategies of these encounters influenced cultural developments in postcolonial contexts. The study employs a holistic approach that integrates evidence from archaeology, ethnography, linguistics, biological anthropology, and native oral traditions. Case studies from the Caribbean, Florida, Louisiana, Virginia, Alaska, Hawaii, and California will be included. (F,SP)

122C. Archaeology of Central America. (4) A survey of what archaeology can tell us about the pre-Columbian cultures of Central America: the Olmec, Maya, Aztec, and their neighbors. (F,SP)

122D. World of Ancient Maya. (4) Formerly 124. A comprehensive study of the development and cultural history of the longest sustained tradition of aboriginal New World civilization. (F,SP)

122E. People of the Andes. (4) Prerequisites: 2. Formerly 125. Inca culture and its antecedents; a survey from the earliest times to the present. (F,SP)

122F. California Archaeology. (4) Prerequisites: 2. Prehistory of California Indians; selected archaeological sites and current issues in interpretations. (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, through the study of archaeology, ethnography, and other relevant fields. No specific sequence to courses; students may take any or all of the following in any sequence.

123A. Stone Age Archaeology. (4) Prerequisites: 2. Overview of stone age cultures and development. Selected topics or geographic areas of paleolithic research. (F,SP)

123B. Archaeology of Africa. (4) Prerequisites: 2. Formerly 126. Prehistory and early civilizations of Africa; selected archaeological sites and current issues in interpretations. (F,SP)

123C. Archaeology of Europe. (4) Prerequisites: 2. Formerly 127. Selected topics and research problems in the archaeology of the Paleolithic and the Neolithic periods in Europe. (F,SP)

123D. Archaeology of East Asia. (4) Prerequisites: 2 recommended. Prehistoric and protohistoric archaeology in China, Japan, and Korea. (F,SP)

123E. Mediterranean Archaeology. (4) Prerequisites: 2 or consent of instructor. Prehistory and early civilizations of the Mediterranean basin and its hinterland. (F,SP)

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, ethnography, and other relevant fields. No specific sequence of courses; students may take any or all of the following in any sequence.

124A. Archaeology of the South Pacific. (4) Selected topics to examine 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: 3 or equivalent 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. The following ethnic groups are emphasized: Native Hawaiians, British-American whites, Chinese, and Japanese. This course satisfies the American cultures requirement.

124B. Hawaiian Ethnohistory. (4) Three hours of lecture per week. Prerequisites: 3 or equivalent 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. The following ethnic groups are emphasized: Native Hawaiians, British-American whites, Chinese, and Japanese. This course satisfies the American cultures requirement.

124C. Pacific Arts and Cultures. Three hours of lecture per week. Prerequisites: 3 or equivalent or consent of instructor. A comprehensive study of the major art forms of the Pacific region, with an emphasis on the cultural and social contexts in which these art forms developed. (F,SP)

Social and Cultural Anthropology

138A. History and Theory of Ethnographic Film. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 2 or 114. The course will trace the development of ethnographic film from its beginnings at the turn of the century to the present. In addition to looking at seminal works at the field, more recent and innovative productions will be viewed and analyzed. Topics of interest include the role of visual media in ethnography, ethnography, and the problematic relationship between seeing and believing. Requires course that is film critiques. (F,SP)

138B. Field Production of Ethnographic Film. (5) Three hours of lecture and three hours of laboratory per week. Prerequisites: 138A (no exceptions). This course will focus on the technical and theoretical aspects of ethnographic field production. Based on the previous coursework in Anthro 138A, students will work toward the production of an ethnographic video from selected project proposals. In addition to weekly discussions of student projects, guest consultants and lecturers will lend their expertise on aspects of production as well as editing. (F,SP)

139. Controlling Processes. (4) Three hours of lecture per week. Prerequisites: Those with at least one society science course will be considered for the subject matter. This course will discuss key theoretical concepts related to power and control and examine the implications of direct mechanisms and processes by which direct control becomes hidden, various and unknown in industrial societies. Readings will cover language, law, politics, religion, medicine, sex and gender. (F,SP)

140. Tribal Societies. (4) Three hours of lecture per week. Prerequisites: 3. Analysis of societies past and present which are small in population, relatively homogeneous, with kin-based social organization, and with a strong emphasis on non-Western societies. (F,SP)

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

144. Social and Cultural Change. (3) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. Western theories of evolutionary and revolutionary change informed by understanding of societies past and present. This course will evaluate these models by reading about the particular and multi- tudes of change in social change in different times and places, and consider new forms of power and social control. (F,SP)

*Professor of the Graduate School
†Recipient of a Distinguished Teaching Award
tion, and the impact of cosmopolitan culture on non-Western societies. (F,SP)

145. Urban Anthropology. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. A consideration of anthropological concepts and methods for the urbanization process in towns and cities. (F,SP)

147A. Comparative Gender Systems. (4) Three hours of lecture per week. The course will illustrate, through case studies, the systematic but variable ways gender shape culture. Will draw particularly on the social sciences to describe patterns of asymmetry, hierarchy, and inequality between men and women and demonstrate both the social bases of gender organization as well as the fundamental effect of gender differentiation on social systems as a whole. Attention will be paid to female agency and historical change as well as social structure. (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-graphic methodology 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 the representation and experience of what we will provisionally call homosexual and transgressive desires or identities. Also listed as Undergraduate Interdisciplinary Studies C147B. (F,SP)

148. Anthropology of the Environment. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. Survey anthropological perspectives on the environment and examines differing cultural conceptions of nature. Coverage includes theory, method, and case materials extending from third world agrarian contexts to urban North America. Topics may include cultural ecology, political ecology, cultural politics of nature, and environmental imaginaries. (F,SP)

150. Psychological Anthropology. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. The history of psychological anthropology from the culture and personality school through current constructionist approaches to indigenous psychologies. Topics may include ethnopsychiatry, psychoanalysis, psychiatric approaches to possession and altered states, emotion and culture, gender, sexuality, and ecstasy. The focus will be on the use of psychology in cultural analysis rather than medical approaches. Is cross-cultural psychological analysis possible, and if so, how? (F,SP)

151. Anthropology of Tourism. (4) Three hours of lecture per week. (1) Variations in touristic motivations and behavioral, economic, and cultural impact of tourism on host cultures and communities. (F,SP)

153. Education and Culture. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. Anthropological approaches to the study of education in traditional and modern culture. (F,SP)

154. Social Inequality. (4) Three hours of lecture per week. Prerequisites: 3 or Sociology 1 or consent of instructor. Comparative examination of theories and systems of social inequality by reference to societies ranging from forager to industrial, from egalitarian to stratified, with attention to inequality defined by kinship, gender, age, servitude, class, caste, race, ethnicity, colonial status, etc. (F,SP)

155. Culture and Power. (4) Three hours of lecture per week. The course examines how representations are situated within fields of power and, in turn, how political considerations are translated into cultural forms. Topics include: philosophy and history of social science, power/knowledge, the social, difference and power, power/knowledge, race, ethnicity, colonial status, etc. (F,SP)

156. Anthropology of Modernity: Science. (4) Three hours of lecture per week. Prerequisites: A background in critical theory. The course will take an anthropological approach to modern science understood as an historically situated, socially contextualized set of practices, discourses and institutions. Readings will include theoretical works drawn from Kuhn, Heider, Weber and Foucault as well as case studies with particular reference to contemporary bioscience. Students are expected to have a background in contemporary theory. (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; methods and concepts relevant to the comparative analysis 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)

Methods

169B. Research Theory and Methods in Socio-Cultural Anthropology. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 3. In- troduction to research philosophy and research design techniques. Will involve local field research on 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)

Also see above descriptions for C103, 131, 132, 133, 134B, 135, 135B, 138B, 141, C193.

Area Studies

170. China. (4) Three hours of lecture per week. Chinese culture and a sensitivity with an emphasis on the village level. (F,SP)

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

172. Society and Culture in the United States. (4) Three hours of lecture per week. Prerequisites: 3 recommended. An introduction to sociological theory and research on American culture and society. (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 which meet the American cultures requirement, taught by members of the Social/Cultural Faculty. See the Schedule of Classes for each semester, and the department’s Internal Catalog for course title, description, the three-hour format, and specific format. This course satisfies the American cultures requirement. (F,SP)

173. North American Indians. (4) Three hours of lecture per week. Historical survey of cultures of the native peoples of the United States and Canada. (F,SP)

174AC. California Historical Anthropology. (4) Three hours of lecture per week. Combining historical archaeology, ethnohistory, and ethnography, this course will take advantage of ethnic groups and their interactions in early colonial California; Native Americans; mission, presidio, pueblo, and rancho 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)

175. Mexico and Central America. (4) Three hours of lecture per week. Ethnology of Indian and Mestizo culture with special emphasis on comparative organization, belief systems, law, economics, kinship, language, and communication. (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 Near East, with special emphasis upon Arab populations. (F,SP)

182. Circumpolar Peoples. (4) Three hours of lecture per week. Arctic and sub-arctic peoples of Europe, Asia, and North America; traditional cultures and present status in national societies. (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)

186. Southeast Asia: Cultures, States, and Capitalisms in the Asian Pacific Rim. (4) Three hours of lecture per week. Prerequisites: 3 or other social science introductory course. An examination of the current political configuration of some Pacific Rim societies against their historical, ecological, and cultural contexts. Part 1: The cultural background of Southeast Asia, with a focus on the precolonial trading empires, the subsequent impact of European colonialism on the peasantry, the political formation of the “plural societies” that emerged. Part 2: Postcolonial changes in gender relations, patron-clientism, Chinese capitalism, and state interventions into the economy. Part 3: Exploration of newly industrializing countries and the links between economic restructuring, morality, social regulation, and knowledge as key to our understanding of the changing cultures, politics, and individual action in the Pacific Rim. (F,SP)

187. Peoples and Cultures of the Himalayas. (4) Three hours of lecture per week. This course will deal with ethnography, ecology and change among the peoples and cultures of the Himalayan regions of India, Pakistan, Bhutan, and less centrally, Afghanistan and China (Tibet). (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)

Folklore

160. Forms of Folklore. (4) Three hours of lecture per week. Prerequisites: Upper division standing. A world-wide survey of the major and minor forms of folklore with special emphasis upon proverbs, riddles, superstitions, games, songs, and narratives. (F,SP)

C160. Forms of Folklore. (4) Three hours of lecture per week. Prerequisites: Upper division standing. A world-wide survey of the major and minor forms of folklore with special emphasis upon proverbs, riddles, superstitions, games, songs, and narratives. Also listed as Interdisciplinary Studies C160. (F,SP) Dunlop

161. Narrative Folklore. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. The study of folktales, myths, legends, and other forms of verbal art; methods and theories of folklore.

162. Topics in Folklore. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 3 or consent of instructor. Special topics in folklore or ethno-musicology. (F,SP)

163. American Folklore. (4) Students will receive no credit for 163 after taking 162 in spring ‘92. Three hours of lecture per week. The course will cover both the materials and scholarship of American folklore.
Generally speaking, the course will treat Native American folklore first, then European, Mexican, and Asian American folklore (including American immigrant traditions) and finally African American folklore. There will be a midterm, final exam, and a library research paper of at least 7-10 pages. This course satisfies the American cultures requirement. (F,SP)

183AC. American Folklore. (4) Three hours of lecture per week. The course will cover both the material and scholarship of American folklore. Generally speaking, the course will treat Native American folklore first, then European, Mexican, and Asian American folklore (including American immigrant traditions), and finally African American folklore. There will be a midterm, a final exam, and a library research paper of at least 7-10 pages. This course satisfies the American cultures requirement.

General Topics

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, method; issues of social and cultural concern; culture change, conflict, and adaptation. May combine more than one subdiscipline of Anthropology. (F,SP)

C193. Introduction to Social Science Computing. (4) Three hours of lecture per week. The course will cover both the materials and scholarship of American folklore. Generally speaking, the course will treat Native American folklore first, then European, Mexican, and Asian American folklore (including American immigrant traditions), and finally African American folklore. There will be a midterm, a final exam, and a library research paper of at least 7-10 pages. This course satisfies the American cultures requirement.

Seminars and Independent Study

H195A-H195B. Senior Honors. (4,4) Three hours of tutorial per week. Credit and grade to be awarded on completion of a term paper. Prerequisites: Open only to honors students. Systematic readings in history and modern theory, collection and analysis of research materials, and the preparation of an honors thesis. Group or individual tutorials. (F,SP)

196. Undergraduate Seminar. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Seminar for the advanced study of the subject matter of a previously given upper division course, emphasizing reading and discussion. (F,SP)

197. Fieldwork. (1-12) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Thirty to sixty-three hours of tutorial or fieldwork per week. Must be taken on a passed/not passed basis. Prerequisites: Upper-division status; consent of instructor. Individual field experience sponsored by a faculty member; written reports required.

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. Two hours of seminar per week. Prerequisites: Consent of instructor. Supervised independent study and research.

Graduate Courses

Physical Anthropology

C200. Human Evolution. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Topic to vary each semester. Also listed as Integrative Biology C265. (SP)

202. Primate Behavior. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

203. Primate Socialization. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

204. Primate Evolution. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

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

211. Primate Ecology. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

212. Method and Theory in Biological Anthropology. (5) May be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. This seminar surveys the major research programs in biological anthropology, their assumptions, and how they ask, how they answer them, and their underlying theoretical bases. Example topics include human evolution, molecular anthropology, primate social ecology, and functional morphology. The emphasis throughout will be on the interplay between the history of ideas and the science of biological anthropology.

Medical Anthropology

215A-215B. Advanced Medical Anthropology. (4;4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. Anthropological theory, data, and methodology in relation to the health sciences, Lectures, readings, and supervised field research. May be taken in association with Medical Anthropology at UCSF.

219. Topics in Medical Anthropology. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Comparative study of mental illness and socially generated disease: psychiatric treatment, practitioners, and institutions.

Archaeology

220. Western North America. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

221. Pre-Columbian Central America. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

222. Archaeology of South America. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

223. African Prehistory. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

225. European and Near Eastern Prehistory. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Required for all graduate students in archaeology. Three hours of seminar discussion of major issues in the history and theory of archaeological research and practice (229A), and of the research strategies and design for various kinds of archaeological problems (229B). To be offered alternate semesters.

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

230X. Various Topics in Current Archaeological Issues and Methods. (2) A variety of formats totaling 22 hours of class meeting time per semester. An overview of new methods, trends, and issues in archaeology.

Social and Cultural Anthropology

240A-240B. Fundamentals of Anthropological Theory. (5,5) Two hours of lecture and two hours of discussion per week. Prerequisites: Required of all graduate students in social/cultural anthropology. Advanced survey of the major theoretical and empirical areas of social and cultural anthropology. Sequence begins Fall.

250. Seminars in Social and Cultural Anthropology. Course may be repeated for credit. Two hours of seminar per week.

250A. Psychological Anthropology. (4)

250B. Gender Anthropology. (4)

250C. Transnationalism. (4)

250D. Resistance. (4)

250E. Cultural Politics. (4)

250F. Religion. (4)

250G. Social Issues and Anthropological Ethics. (4)

250H. Art and Culture. (4)

250L. Anthropology of Law. (4)

250J. Ethnological Field Methods. (4)

250K. Colonialism and Postcolonialism. (4)

250L. Urban Anthropology. (4)

250M. Ecological Anthropology. (4)

250N. Cultural Models. (4)

250O. Action, Interaction, and Practice: Theory and Method. (4)

250P. Social Change and Development. (4)

250Q. Voices of the Subject. (4)

250R. Analysis of Field Data. (4)

250S. Material Culture. (4)

250T. Tribal Societies. (4)

250U. Ethnicity. (4)

250V. Tourism. (4)

250W. Process of Social Control. (4)
250X. Special Topics. (4)

251. Research Design. (4) Course may be repeated for credit. Two hours of seminar per week.

Folklore

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

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

270B. Interactional Socio-Linguistics. (4) Formerly 270C and 271C-271D.

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 Departmental Internal Catalogue for detailed descriptions of course offerings for each semester.

280A. Latin America. (4)

280B. Africa. (4)

280C. South Asia. (4)

280D. China. (4)

280E. Japan. (4)

280F. Southeast Asia. (4)

280G. Oceania. (4)

280H. European Society. (4)

280I. United States Culture and Society. (4)

280J. South American Ethnology. (4)

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

290. Survey of Anthropological Research. (1) Course may be repeated for credit. Two hours of lecture every other week. Must be taken on a satisfactory/unsatisfactory basis. Required each term of all registered 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 conference 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 of candidates for the Ph.D. May not be used for unit or residence requirements for the degree.

Professional Courses

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 #1708, (510) 642-8790
http://www.coe.berkeley.edu/ast/ids/
Chair: Andrew Neureuther, Ph.D.

Executive Committee
David T. Attwood, Ph.D. (Electrical Engineering and Computer Sciences)
Nathan Cheung, Ph.D. (Electrical Engineering and Computer Sciences)
Dang Chi, Ph.D. (Materials Science and Engineering) (Ex-officio)
Eugene E. Haller, Ph.D. (Materials Science and Engineering)
Dorian Liepmann, Ph.D. (Biomechanical Engineering)
Roya Maboudian, Ph.D. (Chemical Engineering)
Andrew Neureuther, Ph.D., Chair (Electrical Engineering and Computer Sciences)

Program Overview

This graduate program operates under the auspices of the College of Engineering’s Interdisciplinary Studies Center. The program has three major foci: applied physics, engineering science, and mathematical sciences. Faculty associated with the new program are drawn from several departments within the College of Engineering, as well as from the Departments of Physics, Chemistry, Chemical Engineering, and Mathematics. Topics of interest include the novel properties and applications of nanostructures, thin films and interface science, microelectromechanical systems (MEMS), and mathematical sciences.

Required are in situ processes, and the use of nanoscale systems and materials. The interdisciplinary nature of the program allows for the development of 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 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 high-voltage microscope and a microfabrication lab for sub-100 nm work in involving lithography, ion-implantation, and thin-film deposition; an integrated sensors laboratory; femtosecond laser laboratories; optical, electrical, and magnetic resonance spectroscopies; and wavefront and X-ray research laboratories. An unparalleled variety of material, chemical, and surface science analytic equipment; and a soft X-ray synchrotron dedicated to materials, chemical, and biological research using high-brightness and partially coherent X-rays. The interdisciplinary, collaborative nature of the AS&T Program 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 advisors. In addition, AS&T sponsors the following courses: AST 201/E 217, Magnetic Materials (3 units); AST 210/EE 213, Introduction to X-Ray Physics and Technology (3 units); AST 239/EE 239, Partially Ionized Plasmas (3 units); AST 225/ME 225, Thin-Film Science and Technology (3 units); AST 295R/ChemE 295R, Applied Spectroscopy (1 unit); Engineering 298B, Topics in Soft X-Rays, Nanomaterials and Applications (1 unit); and Engineering 298B, Science and Technology of Magnetism and Magnetic Materials.

Admission. The complete application, including transcripts, GRE scores, three letters of reference, and a statement of academic and professional goals, is due January 5 for the fall semester. To obtain application forms, students should contact the Applied Science and Technology Graduate Program. 230 Bechtel Engineering Center #1708, University of California, Berkeley, CA 94720-1708. Telephone: (510) 642-8790.

Graduate Courses

C201. Magnetic Materials. (3) Three hours of lecture per week. A comprehensive introduction to magnetism, magnetic materials, and related applications. A description of magnetic phenomena on a macroscopic scale will be followed by discussions of modern experimental methods for magnetic measurements. Intrinsic and phenomenological concepts of magnetism will be developed, including electronic magnetic moments, classical, quantum, and band theories of magnetic behavior. Ordered magnetic materials will be explored in detail.

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 atomic model. Subject matter will include the generation of x-rays with laboratory sources, x-ray lasers, and black body radiation. Concepts of spatial and temporal coherence will be discussed. Also listed as Electrical Engineering 225. (SP) Attwood

C225. Thin-Film Science and Technology. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering, physics, chemistry, or chemical engineering. 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, micro-electromechanical systems and optoelectronics. Also listed as Materials Science and Engineering C225. (SP) Cheung, Sands

C239. Partially Ionized Plasmas. (3) Three hours of lecture per week. Introduction to partially ionized, chemically reactive plasmas, including collisional processes, diffusion, sources, spectroscopy, plasma diagnostics. DC, RF, and microwave discharges. Applications to plasma-assisted materials processing and plasma-wall interactions. Also listed as Electrical Engineering C239. (SP) Lieberman

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 applications 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 Chemical Engineering C295R.

C299. 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 Engineering and Interdisciplinary Studies Center. (F,SP) Staff
Architecture

(Architecture of Environmental Design)

Department Office: Building B, Hearst field Annex, (510) 643-4942
Chair: Charles C. Benton, M.Arch.

Professors

Nezar Alsayyad, Ph.D. University of California, Berkeley. Architecture, urban design, and development in the Third World
Edwin A. Arens, Ph.D. University of Edinburgh. Building technology, energy
Charles Berez, Ph.D. Massachusetts Institute of Technology. Building technology
Peter Bosselmann, M.Arch. University of California at Los Angeles. Architectural design and urban design
Max Fordham, M.Arch. M.S.W. Washington University. Seismic design, post-disaster reconstruction policy and planning
Galen Cranz, Ph.D. University of Chicago. Social factors in design, sociology of taste, body-conscious design, environmental design
Sam Davis, M.E.D. Yale University. F.A.I.A. Architectural design
Anthony Dubovsky, M.A. University of California, Berkeley. Visual design
Richard Fleury, M.Arch. University of California, Berkeley. Architectural design
Harriette Forster, Ph.D. M.A. Princeton University. Affordable housing, sustainable environments, passive solar, daylighting and energy conservation
Yehuda Kalay, Ph.D. Carnegie-Mellon. Computers, design education and methods
Raymond Litchfield, M.S., M.A., M.C.P. Columbia University. University of California, Berkeley. Architectural design, special population
Jean-Pierre Protzen, Dipl. Arch. E.P.U.L. Université de Genève. Analytical geometry and methods
Stanley Saitowitz, M.Arch. University of California, Berkeley. Architectural design
Adrian Sanz, Ph.D. Michigan. M.C.P. University of Pennsylvania. Architectural design
Daniel Solomon, M.Arch. University of California, Berkeley. Architectural design
Stephen Timlin, Ph.D. Harvard University. Architectural history
Marc Treib, M.Arch. University of California, Berkeley. Architectural and urban design and planning
Scandinavia, landscape architecture and the arts
Del Upton, Ph.D. Brown University. Architectural history and theory
Christopher Alexander (Emeritus), Ph.D. Harvard University. Architectural design, pattern language
Richard Haag (Emeritus), M.A. Harvard University
Kenneth H. Cardwell (Emeritus), A.B. University of California, Berkeley
Vernon A. DelMar (Emeritus), A.B., F.A.I.A. University of California, Berkeley
Margaret R. Dhaemers (Emeritus). M.A., M.F.A. California College of Arts and Crafts, Mills College. Architectural design
Edward D. Edes (Emeritus). W. Russell Ellis, Jr. (Emeritus), Ph.D. University of California at Los Angeles. Social factors in design
Norma D. Ewens (Emeritus). Ph.D. Yale University
Samy V. Hassid (Emeritus), Ph.D., F.A.I.A. Harvard University
Sanford Hirshen (Emeritus), B.Arch., F.A.I.A. Columbia University. Architectural design
Henry J. Lagorio (Emeritus), M.A. University of California, Berkeley
Lars G. Lenz (Emeritus), M.Arch. Harvard University. Architectural design, semiotics
Clare Cooper Marcus (Emeritus). M.A., M.C.P. University of Nebraska: University of California, Berkeley. Social factors, geography
Richard L. Mayer (Emeritus), Ph.D. University of California at Los Angeles
Roger Montgomery (Emeritus), M.Arch. Harvard University. Urban planning
Donald E. Olsen (Emeritus), M.Arch, F.A.I.A. Harvard University
Robert C. Peters (Emeritus), M.F.A., F.A.I.A. Princeton University. Architectural design, lighting design
Jesse Reischek (Emeritus), Chicago Institute of Design
Crabnook Academy of Art
Herbert Schiffer (Emeritus), Ph.D. Harvard University
Karl V. Steinbrugge (Emeritus). B.S. Oregon State University
Claude Stoller (Emeritus), M.Arch., F.A.I.A. Harvard University
Sin H. Van der Ryn (Emeritus), B.Arch. University of California, Berkeley. Architecture, urban design, appropriate technology

Associate Professors

R. Gary Black, M.Arch., M.S. University of California, Berkeley. Six, Stucop
Gail Brager, Ph.D. University of California, Berkeley. Building technology, comfort, energy
Renee Davids, Royal College of Art, London. Architectural design
Paul Greth, Ph.D. University of California, Berkeley. History of urban form and cultural landscape

Kathleen James-Chakrabarty, Ph.D. University of Pennsylvania. History of architecture
Jill Stoner, M.Arch. University of California. Architectural design
Susan Ubbelohde, M.Arch. University of Oregon. Architectural design, energy, climate response, daylighting
Gary R. Brown (Emeritus), M.Arch. Harvard University. Architectural design
Sara S. Ishikawa (Emeritus), B.Arch. University of California, Berkeley. Architectural design
Kenneth H. Simmons (Emeritus), B.Arch. University of California, Berkeley. Architectural design

Assistant Professors

Thomas Chastain, M.Arch. Massachusetts Institute of Technology. Architectural design
Raveenah Chokshambidchabai, M.Arch., M.L.A. Harvard University. Architectural design
Renee Chow, M.Arch. Massachusetts Institute of Technology. Architectural design
C. Greg Crysler. Ph.D. State University of New York, Binghamton. Architectural theory and criticism
Hanspjäppich Nies, Ph.D. University of California, Berkeley. Architectural design, pattern language

Adjunct Professors

Carlos Fernando, M.Arch. Massachusetts Institute of Technology
W. Mike Martin, Ph.D. University of California, Berkeley. Design and study of practice methods and theories
Rob Quigley, B.Arch.
Charles Salter, M.B.A.
Cathy Simon, M.Arch
Gerold Wessbach, J.D.

Department Overview

Creating livable environments means balancing complex social, political, economic, and technical requirements to meet human needs. Understanding how these components and methods of interpreting and ultimately resolving conflicting forces is the major objective of our educational endeavor. To respond to this challenge, faculty members in Architecture represent a variety of scholarly and professional backgrounds and interests.

Although ability in building design is often considered to be the goal of our educational system and our graduates, knowledge about how people can affect environments, plan and manage human, financial, and natural resources in the creation of that environment is our major emphasis. Many students follow programs in environmental history, behavioral sciences, resource management, and design theory. Problem identification and formulation and the reconciliation of technical, aesthetic, and cultural concerns are skills which often do not entail building construction. The department prides itself on educating not only good architects, but also environmentally knowledgeable citizens.

Undergraduate Program

Undergraduates enroll in a four-year program leading to the Bachelor of Arts degree with a major in architecture.

The undergraduate program in architecture combines required courses in environmental design and architecture with opportunities for highly varied individual programs planned by the student with the assistance or guidance of an advisor. Through core courses the program offers a broad introduction to the discipline of architecture, and students can specialize in community design, applied building sciences, design methods, history and theory, or the social basis of design. In addition to offering a sound and engaged education, undergraduate studies can provide preprofessional competence for entry-level employment in architecture, for graduate work in architecture, or for further studies in a related field.

Accreditation. Most states require that an individual intending to become an architect hold an accredited degree. There are two types of degrees that are accredited by the National Architectural Accrediting Board (NAAB). These credits are required to graduate with an accredited degree. Depending upon previous preparation, students are required to complete a minimum of 32 to 48 credit units, including a comprehensive research methods course and a faculty team. Remaining course work will be determined by the nature of the proposed research. A research requirement makes no restriction as to the field of undergraduate preparation. However, the length of the required residence period, the number of required semester course units, and the specific list of required courses may vary depending on the undergraduate major, professional and related 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 physics through mechanics.

The basic course leading to the M.Arch. degree takes three academic years and requires the completion of at least 72 units during that period of residence. Persons who have a B.A. or B.S. degree with a major in architecture may receive up to one year of advanced standing. The Master of Architecture 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 in the department.

Special one-year M.Arch. programs are available to persons holding the five-year, professional undergraduate degree, Bachelor of Architecture, from an accredited school, or comparable five-year degrees from foreign universities and technical institutions.

Doctor of Philosophy Degree in Architecture.

The Doctor of Philosophy in Architecture program is open to exceptionally qualified persons who present outstanding academic records along with clear evidence of commitment and ability in architectural research and scholarship. Graduate Division requirements with respect to admission, the language requirement, candidacy, and the dissertation under Plan B apply (see Index). Applicants must hold a bachelor's degree from an accredited institution, but the department makes no restriction as to the discipline of the undergraduate preparation. Additional information is available from the architectural graduate secretary.

Master of Science Degree in Architecture.

This professional degree program was developed to offer the opportunity for advanced research in specialized areas within the architecture curriculum. An academic degree is appropriate for those who already hold a degree in architecture or related field that wish to study a particular subject. Applicants from related disciplines may be accepted into the program, provided they demonstrate experience, knowledge, and research ability. Remaining course work will be determined by the nature of the proposed research. A research requirement makes no restriction as to the field of undergraduate preparation.
Architecture

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. Three sections-3 to 4 to be graded on a pass/no pass basis. The Berkeley 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. Berkeley 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. 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 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

Architectural Design

Upper Division Courses

100A-100B. Fundamentals of Architectural Design. (5,5) Three hours of lecture and five hours of studio per week. Prerequisites: ED 11A-11B. Must be taken in sequence. Introductory courses in the design of buildings. Problems emphasize the major social, technological and environmental determinants. (F) Staff

100A. Seminar in Architectural Theory. (1-4) (F,SP) Staff

100B. Seminar in Architectural Criticism. (1-4) (F,SP) Staff

100C. Current Issues in Architecture. (1-4) (F,SP)

100D. Final Project Preparation Seminar: Thesis and Report. (3) Prerequisites: Graduate standing. Formerly 209A. This is a fall seminar for students who plan to work on final projects (theses and professional reports) during the spring. The seminar, including lectures by the instructor, is meant to train students in pre-thesis or professional project research and to help them in selecting their thesis or professional report topic. The course includes weekly exercises ranging from writing articles documenting, illustrating, and critiquing buildings to producing a thesis or professional report prospectus. (F)

100X. Special Topics: Architectural Design. (1-4) (F,SP) Staff

Social and Cultural Factors in Design

Upper Division Courses

110. Social and Cultural Factors in Design. (3) Forty hours of lecture and 20 hours discussion per semester. A survey of the bases of social functions and architectural design, with respect to individuals, groups, families, neighborhoods, and organizations. (SP) Cranz

111. Housing: An International Survey. (3) Three hours of lecture per week. Introduction to international housing from the Architectural and City Planning perspective. Housing issues (social, cultural, and policy) ranging from micro-scale (house) to macro-scale (city) presented with a comparison of housing situations in developed and developing countries. (SP) Staff

118AC. Cultures and Settings: Supporting Variations in Residential Design. (3) Three hours of lecture/discussion/student presentation/exercise per week. Residential communities that endure have a capacity to house multiple and evolving patterns of living. What aspects of residential design foster or inhibit cultural variations and change? This course has three parts: a theory of residential design from the perspective of professional practice and cultural practices; a comparative analysis of everyday patterns of inhabitation; and the design of environments that accommodate a range of cultural readings. Students are asked to draw plans, write, and conduct field surveys. This course satisfies the American cultures requirement. (F) Chow
C119. Office of the Future. (3) Three hours of lecture per week. Prerequisites: Upper division standing. Conventional office design will undoubtedly change, primarily in response to concerns about productivity and health. How can research, especially psychological research, help us improve the design of offices? What should offices look like 10-50 years from now? How will they be used? These are questions the course will try to answer. Also listed as Psychology C191 and Undergraduate Interdisciplinary Studies C137.

Graduate Courses

211. Theory and Methods in the Social and Cultural Basis of Design. (4) Course may be repeated for credit. Three hours of seminar per week plus individual advisement. Prerequisites: 110 or consent of instructor. Explores the function of various theories which explain and document the relationship between humans and the environment they build; outlines the research methods appropriate to each theory. (F,SP) Crazan

219. Seminar on Social and Cultural Bases in Design. Course may be repeated for credit as topic varies. Formerly 211 and 219A through 219G. Selected topics such as social policy and building form, environments for special populations, for birth and death, social forms and housing form, personal and societal values in design, participatory design, and urban parks. For current section offerings see departmental announcement.

219A. Design and Housing in the Developing World. (3) (SP)

219D. Social Aspects of Housing Design. (1-4)

219E. Social Form and Spatial Organization. (1-4) (F,SP)

219F. Urban Parks. (1-4)

219X. Special Topics: Social and Cultural Bases of Design. (1-4) Fifteen hours lecture/seminar per unit per semester. Prerequisites: 210 or consent of instructor.

Practice of Design

Upper Division Courses

120. Introduction to the Practice of Architecture. (3) Two hours of lecture and one hour of discussion per week. Architect, owner, developer, and contractor relations; contract documents; and the ethics of the profession. (F) Staff

125. Project Development: Analysis, Strategy, Financing. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 120A and senior standing. Formerly 135. Introduces the process of project development with a focus on techniques for determining the economic viability of a project; the influence of financing on design and development decisions. (SP) Comerio

128. Architectural Internship. (5) Twenty-four hours of lecture/seminar and 160 hours of internship per semester. Prerequisites: 120 and consent of instructor. An intensive and structured exposure to the professional practice of architecture using the resources of practicing architects offices as the "laboratory." (F,SP) Staff

129X. Special Topics in the Practice of Design. (1-4) Fifteen hours lecture/seminar per unit per semester. (F,SP)

Graduate Courses

229. Seminar on the Practice of Design. Course may be repeated for credit as topic varies. Prerequisites: Designated section of 129. Selected topics such as issues of project development and professional practice, construction law, materials and specifications, construction management, marketing and management, professional writing, issues in community development and public policy. For current section offerings see departmental announcement. Staff

229F. Introduction to Construction Law. (1-4) (F)

229G. On the Profession of Architecture. (1-4) (F)

229H. Problems and Opportunities in Architecture. (1-4) (F,SP)

229K. Special Topics in the Practice of Design. (1-4) (F,SP)

Design Theories and Methods

Upper Division Courses

130. Introduction to Design Theories and Methods. (3) Forty-five hours of lecture and 20 hours of discussion per semester. Formerly 130A. Comparison and discussion of the theories of environmental design, and development and testing of various methods, tools, and techniques available for environmental designers. Particular emphasis lies on the difficulties of environmental design and related fields. (SP) Staff

132. Introduction to Computer-Aided Design in Architecture. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: IDS 110 or equivalent or consent of instructor. This course introduces students to the principles of CAD, the theories and methods on which it is founded, and its principal applications in practice (generating, evaluating, modeling, drafting, and rendering design solutions). (F,SP) Staff

133. Computer Applications in Architecture. A student may take sequentially 2 or 3 modules in one semester. These courses (called "modules") teach how to use specific hardware/software tools. It is intended to build computing skills needed in other courses, such as design studios. The length and the number of modules depend on the content. Each module is a self-contained unit. Some have prerequisites, and some can be taken only in conjunction with another course, as noted. (F,SP) Staff

133A. Two-Dimensional Computing Techniques in Architecture. (2) Two hours of lecture per week. This course looks at the principal 2-Dimensional CAD techniques used by architects to create presentations, schematic drawings, and working documents. Emphasis will be placed on the generation of 2-D architectural graphics, the integration of those graphics with nongraphic data, and the uses of disparate graphic approaches. (F,SP)

133B. Three-Dimensional Computing Techniques in Architecture. (2) Two hours of lecture per week. This course introduces students to digital imaging and computer techniques used by architects to create computer models, rendered images, and animation. Emphasis will be placed on the generation of 3-D architectural graphics and their presentation. (F,SP)

133C. Visual Simulation. (2) Two hours of lecture per week. This course introduces students to digital imaging and computer techniques used by architects to create computer models, rendered images, and animation. Emphasis will be placed on the generation of 2-D architectural graphics, the integration of those graphics with nongraphic data, and the uses of disparate graphic approaches. (F,SP)

133D. Rendering and Animation. (1,2) Fifteen hours of lecture/seminar/laboratory per unit per semester. This course is a five-to-seven-week auxiliary course to 138, Advanced Computer-Aided Rendering and Animation. Students will learn how to operate current computer-aided equipment and software while being introduced to 3-D modeling and animation principles. Lectures, demonstrations, discussions, and critiques conducted in a studio atmosphere of the subjects specified in the syllabus. The equipment used will be Silicon Graphics workstations. Most of the work will take place at the computers. (F,SP)

133E. Computer Applications in the Design Studio. (1,2) Fifteen hours of lecture/seminar/laboratory per unit per semester. This module is taught as an adjunct to a specific design studio and is designed to facilitate the use of 2-D drawing and 3-D modeling CAD tools in the studio. (F,SP)

133X. Special Topics in Computer Applications. (1,2) One to two hours of lecture per week. Current topics in computing technology. Topics will vary by semester or offering. (F,SP)

134. Graphic Introduction to Computer Programming. (4) Three hours of lecture per week. This course presents the basic principles of computer programming and interactive computer graphics. It develops the skills for the presentation, manipulation, and graphic display of lines and text for use in computer-aided architectural design, teaching the programming language PASCAL, and user interfaces. (F) Kalay

135. Digital Design: Process and Methods of Modeling and Presentation. (3) Two hours of lecture, one hour of discussion, and three hours of laboratory per week. Prerequisites: Consent of instructor. This course studies the process of architectural design using three-dimensional computer modeling programs and two-dimensional computer graphics programs. The objective is to gain an understanding of an alternative design methodology which supports traditional architectural practices. The vehicle for this study will be the design of a simple building, exclusively created via a computer. The completed three-dimensional building design will be used to study two-dimensional forms of representation and creative expression. (F,SP) Staff

138. Advanced Computer-Aided Rendering and Animation. (1-4) Course may be repeated for credit. This is a computer class that will enable students to carry out self-determined architectural or other projects in consultation with the professor and the GSI. There will be discussions, demonstrations, viewing of historical and current animations, idea sessions, field trips, guest reviewers and lectures. For development beyond the original project will result from the interaction of the idea with the computer input and class discussions. Results may be either 2D or 3D, still or animated. Groups of two or more students may work on a project. The class will be conducted in the Silicon Graphics Industries lab. Reviews will take place around the workstation. (F,SP) Staff

139X. Special Topics: Design Theories and Methods. (1-4) Course may be repeated for credit as topic varies. Fifteen hours lecture/seminar per unit per semester. Prerequisites: 130. (F,SP)

Graduate Courses

230. Advanced Design Theories and Methods. (3) Forty-five hours of lecture/seminar per semester. Prerequisites: 130A or consent of instructor. Design and planning methods, their theoretical foundations and practical applications. (SP)

231. Research Methods for Design. (2) Thirty hours of lecture/seminar per semester. Methods of scientific research and the use of research in design. Required for doctoral students in the area of Design Theories and Methods. (F)

235. Seminar in Design Theories and Methods for Doctoral Students. (1) Course may be repeated for credit. Thirty hours of seminar/discussions per semester. Must be taken on a satisfactory/unsatisfactory basis. Required for doctoral students in this study area.

239. Seminar in Design Theories and Methods. Course may be repeated for credit as topic varies. Prerequisites: 130A or consent of instructor. (SP)

239A. Design and Computers. (1-4)

239C. Ethics of Design. (1-4)

239D. Logics of Design. (1-4)

239E. Models of Design. (1-4)

239F. Evaluation and Prediction in Design. (3) Forty-five hours of lecture/seminar per semester. Seven-week module course. This course investigates the nature of evaluation and prediction in design, and their relationship to the overall design process. It focuses on the three major constructs comprising evaluation and prediction: the definition of design goals, the methods used to predict the expected performance of design solutions, and the means that can be used to evaluate the correspondence of the predicted performance to the measured performance as specified by the goals. (F) Kalay

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
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

Architecture / 121
Building Environments

Upper Division Courses

140. Introduction to Energy and Environmental Management. (4) Fifty hours of lecture and 30 hours of discussion per semester. Prerequisites: Requisites: Physics or equivalent, or consent of instructor. Study of the thermal and lighting environments in buildings, with emphasis on quantitative design techniques. (F,SP)

149. Seminar on the Physical Environment in Buildings. Course may be repeated for credit as topic varies. Prerequisites: 140. Special topics such as climactic design, heating, ventilating, air-conditioning systems, lighting, and acoustics. For current semester offerings see departmental announcement. (F,SP)

149A. Acoustics. (1-4) (F,SP)

Building Environments

Graduate Courses

240A. Advanced Study of Energy and Environmental Issues in Design. (3) Twenty-five hours of lecture per semester. Prerequisites: 140 or consent of instructor. The first part of this course covers thermal and solar design, the second lighting design. (F,SP)

241. Research Methods in Building Sciences. (2) Course may be repeated for credit. Thirty hours of lecture/seminar per semester. Required for doctoral students in the area of environmental physics. (SP)

242. Building Energetics. (1) Fifteen hours lecture/seminar; offered first 5 weeks of semester. Prerequisites: 140 or consent of instructor. Preparation for advanced study in building science. Topics include: energy efficiency, solar heat transfer, air flow, psychrometrics, and thermal comfort. (SP)

243. Natural Cooling and Ventilation. (3) Forty-five hours lecture/seminar per semester. Prerequisites: 140, 242 or consent of instructor. Course focuses on passive cooling strategies, including solar cooling, natural ventilation, radiation, evaporation, and single-earth contact cooling and their treatment in architectural design. (F)

244. Mechanical Systems for Environmental Control. (2) Thirty hours lecture/seminar; offered last 10 weeks of semester. Prerequisites: 140, 242 or consent of instructor. Study of principles and practical aspects of heating, ventilating, and air-conditioning (HVAC) of buildings. Discussion of criteria for comfort, and methods of estimating energy flows in buildings and resulting heating and cooling loads. Various types of HVAC systems will be described. (SP)

244A. Pipes and Ducts: Mechanical Systems and Architectural Space. (2) Three hours of lecture for each week. Exploration of mechanical systems in terms of their impact on architectural design, energy performance, and thermal comfort. Topics cover residential and commercial applications, centralized HVAC and innovative task conditioning systems, architectural systems integration, research/demonstration projects and field evaluation methods. Field trips, hands-on exercises, and design analysis give students a direct opportunity to see how real systems affect architectural space in real buildings. (F,SP) Brager

244B. Pipes and Ducts: Mechanical Systems and Architectural Space. (1) Three hours of lecture for five weeks. Prerequisites: 244A. Exploration of mechanical systems in terms of their impact on architectural design, energy performance, and thermal comfort. Topics cover residential and commercial applications, centralized HVAC and innovative task conditioning systems, architectural systems integration, research/demonstration projects and field evaluation methods. Field trips, hands-on exercises, and design analysis give students a direct opportunity to see how real systems affect architectural space in real buildings. (F,SP) Brager

Graduate Courses

245. Daylighting Analysis Using Physical Models. (3) Three hours of seminar per week. Prerequisites: 140 or consent of instructor. Scale models as a vehicle for the investigation of daylight in architectural space including issues of photometric measurement, qualitative assessment, temporal variability, and presentation technique. (SP)

249. Seminar: Physical Environment in Buildings. Course may be repeated for credit as topic varies. Prerequisites: Requisites: 140. Selected topics such as climatic design, mechanical systems, natural lighting, artificial lighting, acoustics. For current session offerings see departmental announcement. (F,SP)

249C. Lighting Design. (1-4)

249D. Natural Lighting. (1-4)

249X. Special Topics in the Physical Environment in Buildings. (1-4) (F,SP)

Structures and Construction

Upper Division Courses

150. Introduction to Structures. (4) Forty-five hours of lecture and thirty hours of discussion per semester. Prerequisites: Physics 84A. Study of forces, materials, and structural significance in the design of buildings. Emphasis on understanding the structural behavior of real building systems. (F) Black

152. Introduction to Construction. (3) Forty hours of lecture and 20 hours of discussion per semester. Study of typical building subsystems, types of construction, choice of materials and details of design. (SP) Buntrock

153. Performance of Wood in Structures. (3) Three hours of lecture per week. The survey of wood properties and wood products of importance to building design and construction. Emphasis is placed on prevention of biodeterioration. Case studies will be presented to avoid wood failure in structures, showing proper usage of wood products. (F) Black

154. Design and Construction 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 structural concepts explored in a laboratory environment. (SP) Black

159. Seminar on Structures and Construction. Course may be repeated for credit as topic varies. Prerequisites: 150. Special topics such as building performance, production and materials. For current section offerings see departmental announcement. (F,SP)

159X. Special Topics: Structures and Construction. (1-4) (F,SP)

Graduate Courses

250. Structures and Space. (3) Forty-five hours of lecture/discussion and 30 hours of laboratory per semester. Prerequisites: 150. Detailed quantitative investigations into the structural behavior of building systems and the relationships of those systems to architectural space. Finite element methods of structural analysis and models employed in the laboratory. (F) Black

253. Architectural Design for Seismic Forces. (4) Sixty hours of lecture/seminar per semester. Prerequisites: Civil Engineering 128A-128B. Elements of seismic design concepts and construction problems of buildings with emphasis on experience gained from recorded earthquakes. Seismic risk concepts and design consideration based on studies of laterally stable building forms. Urban technology of earthquake hazard mitigation.

254. Structures, Construction and Space in Great Historical Buildings. (3) Forty-five hours of lecture/discussion and thirty hours of laboratory work per semester. Prerequisites: 150 and 170. Study into the relationships between architectural space, structural behavior, and construction systems/methods in buildings from the bronze age to the present. Jointly taught with History of Architecture. Finite element methods utilized for structural investigations. Offered even-numbered years. (F) Black

259. Seminar on Structures and Construction. Course may be repeated for credit as topic varies. Selected topics such as experimental structures, architectural preservation, construction management implementation, and geologic hazards to construction. For current section offerings see departmental announcement.

259X. Special Topics: Structures and Construction. (1-4) Prerequisites: 250 or 252 and consent of instructor. (F,SP)

The Building Process

Upper Division Courses

160. The Nature of Order. (3) Three hours of lecture per week. Lectures to determine the foundation of all architecture. The course lays the foundation of a way of seeing architecture which brings practical function and inner spirit together in one conception that finds its origin in the physical nature of matter.

Graduate Courses

260A. The Nature of Order, Graduate Seminar. (2) Two hours of seminar per week. Prerequisites: Required of graduate students taking 160. This seminar examines at an advanced level the concepts and theories presented in Architecture 160. Students will make regular presentations with criticism or commentary on Architecture 160 lecture topics.

260B. Advanced Theory of Order. (3) Forty-five hours seminar per semester. Prerequisites: 260A. Advanced topics in the theory of order. (SP)

260D. Patterns in Different Cultures. (3) Forty-five hours lecture/seminar per semester. Prerequisites: Consent of instructor. Housing patterns and other patterns in different cultures and subcultures. Emphasis on the problem of variation between cultures and subcultures and on the uniqueness of each culture.

262X. City Building—Formation of Urban Wholes. (3) Thirty hours of seminar per semester. Prerequisites: The formation of urban wholes, based on the main principles of, first, “wholeness in the structure of the city,” and, second, “city as a growing whole.”

263A. Building Construction: Elementary Construction Experience. (3-5) Course may be repeated for credit. One hundred-eight to 180 hours field work per semester. A laboratory course with on-site experience in building construction, with emphasis on problems of innovation and the relationship of architect to builder. Work includes projects in concrete, masonry, steel, wood, and tile.

265. Color. (5) Sixty hours of seminar/workshop each semester. Prerequisites: 160 is recommended but not required. The meaning and rules governing the use of color, with special reference to the use of color phenomena in the understanding of wholeness. Students will be expected to make a series of paintings and designs and colored objects.

269. Seminars in Building Process. Course may be repeated for credit. One hour of seminar per week per unit. Prerequisites: Consent of instructor. Current topics in building process. Topics vary by semester or offering.

269X. Building Process Atelier. (1-4)
History of Architecture

Upper Division Courses

170A-170B. An Historical Survey of Architecture and Urbanism. (4,4) Fifty-four hours of lecture and 15 hours of seminar/discussion per semester. The first part of this sequence studies the ancient and medieval periods; the second part studies the period since 1400; the aim is to look at architecture and urbanism in their social and historical context. (F,SP) Staff.

172. Great Cities. (3-4) Forty-five hours of lecture per semester; additional 15 hours of seminar for one additional unit. Prerequisites: 170A-170B. A study of the physical fabric of a great city and its changing character through time.

173A. Modern Architecture. (3) Forty-five hours of lecture per semester. Prerequisites: 170A-170B and consent of instructor.

174A. American Architecture. (3) Forty-five hours of lecture per semester. Prerequisites: 170A-170B and consent of instructor.

174B. Vernacular Architecture. (3) Forty-five hours of lecture per semester. Prerequisites: 170A-170B and consent of instructor.

C174B. Vernacular Architecture. (3) Three hours of lecture per week. Prerequisites: 170A-170B. This course will introduce you to a variety of North American vernacular building traditions, to help you understand that architectural styles are not academically trained as architects design and build; how buildings and landscapes are used, and what they mean to their builders and users. Topics to be explored include rural and urban house types, vernacular building systems, commercial architecture, the public landscape, and the vernacular landscapes of work and of religion, focusing on European, African, and Native American traditions that shaped the familiar and widespread folk architecture, as well as on the urban landscapes of 19th- and 20th-century immigrants. We will look at built environments as expressions of ethnic and racial identities, as social forces, and as conscious works of art. Also listed as American Studies C178B. This course satisfies the American cultures requirement. Upton

174C. San Francisco Architecture. (3) Forty-five hours of lecture/seminar per semester. Prerequisites: 170A-170B and consent of instructor.

175A. Pre-Columbian Architecture. (3) Forty-five hours of lecture per semester. Prerequisites: 170A-170B and consent of instructor.

175C. Japanese Architecture. (3) Forty-five hours of lecture per semester. Prerequisites: 170A-170B and consent of instructor.

175D. Islamic Architecture. (3) Course may be repeated for credit. Forty-five hours of lecture per semester. Prerequisites: 170A-170B and consent of instructor.

179. Proseminar in the History of Architecture. (1-4) Course may be repeated for credit. Fifteen hours of lecture/seminar per unit per semester. Prerequisites: 170A-170B and consent of instructor. Special topics in Architectural History. For current section offerings, see departmental announcement.

179AC. Architecture and Ethnicity: Califormia Sites of Memory. (3) Forty-five hours of lecture/seminar per semester. Prerequisites: Open to upper division undergraduate and graduate students. An historical and archaeological investigation of how spatial patterns are transmitted across cultures. This course satisfies the American cultures requirement. (F)

Graduate Courses

271. Methods of Historical Research and Criticism in Architecture. (4) Sixty hours of lecture/seminar per semester. Prerequisites: Doctoral candidate or consent of instructor. (SP)

279. Seminar in the History of Architecture. Course may be repeated for credit as topic varies. Prerequisites: 179 or consent of instructor.

279B. Asian Architecture. (1-4)

279C. California Architecture. (1-4)

279D. History of Housing. (1-4)

279F. Modern Architecture. (1-4)

279G. San Francisco Architecture. (1-4)

279H. Urban Design. (1-4)

279X. Special Topics: Architectural History. (1-4) (F,SP)

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 predissertation and prethesis research strategies, expose them to variety of inquiry methods including the value of scholarly research, the nature of evidence, critical reading as content analysis and writing, presenting and illustrating scholarship in the various disciplines of architecture. (F)

Special Studies Courses

Upper Division Courses

198. Special Group Study. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Studies developed to meet needs. (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 in the General Catalog. Studies developed to meet individual needs. (F,SP)

Graduate Courses

298. Special Group Study. (1-4) May be repeated for credit up to unit limitation. Sections 1-3 to be graded on a satisfactory/unsatisfactory basis. Sections 4-10 to be graded on a letter grade basis. Special group study topics on topics to be introduced by instructor or students. (F,SP)

299. Individual Study and Research for Master’s and Doctoral Students. (1-9) Course may be repeated for credit. 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 dissertation topic. (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 formalized opportunities for students to prepare themselves for the various examinations required of candidates for the Ph.D. This course may not be used for units or residence requirements for the doctoral degree. (F,SP)

Visual Studies

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 prerequisite to B. Projects in graphic form, color, and word-image relationships.

181. Introduction to Photography. (4) Thirty hours lecture and 75 hours studio per semester. Assignments testing standard materials, equipment, and processes for optimum performance resulting in a completed portfolio. Preference will be given to students in the College of Environmental Design. (F,SP)

182AC. Picturing Identity. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: Consent of instructor. This course uses photography to examine ways in which ideas of ethnicity are communicated and given visual form. Students will research and compare ways in which different ethnic groups have been represented in the past and at present in fine arts, advertising, and mass media. Students will begin by collecting existing examples of representations from mass media and then visually interpret that material by working in collage and written word and by using other presentation forms, including documentary photography, personal explorations of identity, and explorations of fine artists of color. This course satisfies the American cultures requirement. (F) Watts

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, graphic forms, and typography. For current offerings see the departmental announcement.

185AC. 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." The course aims to 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. This course satisfies the American cultures requirement. Staff

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 aims to 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: Photographic. Course may be repeated for credit as topic varies. Prerequisites: 181. Studio sections in Photography as an Art Form, Documentary Photography, Light and Motion Studies, Artistic Lighting Photography. For current section offerings see departmental publications.

186A. Documentary Photography. (1-4) Fifteen hours of lecture/seminar or sixty hours of studio per unit per term for eight weeks. (F,SP)

187. Selected Topics: Drawing. Course may be repeated for credit. Prerequisites: Environmental Design 11A-11B.

187A. Freehand Drawing. (1-4) (F,SP)

187X. Special Topics: Drawing. (1-4)

189. Seminar in Visual Studies. (1-3) Course may be repeated for credit. Fifteen hours lecture/seminar per unit per semester. Prerequisites: 180A-180B. For current section offerings see departmental publications.

197. Field Studies in Visual Studies. (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. Supervised experience relevant to specific areas of design in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. See General Catalog regarding requirement. See General Catalog regarding unit limitation toward the degree. (F,SP)

198. 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. Studies developed to meet needs. See General Catalog regarding unit limitation toward the degree. (F,SP)

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R&C requirement
AG suffix=course satisfies American cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

Architecture / 123
Art and History of Art
(College of Letters and Science)

Practice of Art

Department Office: 345 Kroebber Hall, (510) 642-2582
http://ls.berkeley.edu/dept/artpractice
Chair: Prof. Mary Lovelace O’Neal, M.F.A.

Professors
Anne L. Healy, B.A.
Mary L. O’Neal, M.F.A.
Richard B. Shaw, M.F.A.
Robert L. Hartman, M.A. (Emeritus)
Radu A. Kasten, M.A. (Emeritus)
James F. Melchert, M.F.A. (Emeritus)
George J. Vrulvagi, M.A. (Emeritus)
David W. Simpson, M.A. (Emeritus)
Peter H. Voulkos, M.F.A. (Emeritus)
Brian A. Wall (Emeritus)

Associate Professors
Katherine D. Sherwood, M.F.A.
Terrel C. Ballaine, M.F.A. (Emeritus)

Assistant Professor
Shawn Brixey, M.S.

Professor-in-Residence
Squeak Carnwath, 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 esthetic investigation.
2. To help students learn to think visually.
3. To help students understand the strategies that artists have devised to cope with problems in both traditional and non-traditional methods of art-making.
4. To help students develop a creative intelligence through practicing a visual arts discipline.

While the undergraduate major is largely made up of studio courses, it also requires at least three courses in art history and one in the analysis of art-works (Art 150). An art student should be familiar with ways in which visual ideas have been manipulated and developed in the past and how specific notions have affected the perception that human beings have of themselves and their circumstances.

Work by students is featured in the exhibitions of the Wurth Ryder Art Gallery, an adjunct educational facility that is open to the public.

Major Program

Prospective art majors should contact the Art Practice Department regarding their application to the major.

Transfer Students: If you are transferring to Berkeley with no previous college-level art courses, you are subject to the new art major. All new majors must complete Art 150, 12, 13, 14, and 15, seven upper division studio courses, Art 150, and three specified courses in history of art (see below).

Lower Division: Art 8, 12, 13, 14, and 15.

*For intended art majors: We strongly recommend that you complete Art 8 as a prerequisite to 12, 13, and 14.

Upper Division: Art 150, 117 or 118, and six additional upper division courses in Practice of Art.

*We strongly recommended that you complete Art 150 the first semester of the junior year.

History of Art: A minimum of three courses, one chosen from each of the following three course clusters:

A. Problems and Introductions: HA 10, HA 30, HA 31;
B. Twentieth-Century Art: HA 181, HA 182, HA 186, HA 190 (20th-century topics only);
C. One art history course of the student’s choosing.

With the consent of the major adviser, a student may be given credit toward the major for up to two art-related courses taken outside the department, e.g., Set Design (Dramatic Art), Photography (College of Environmental Design), etc.

Honors Program in the Practice of Art: Students with an overall GPA of 3.5 or higher who are in their senior year may, with the permission of a regular faculty member, enroll in the honors program.

This is an independent study course, taken for a minimum of one semester and a maximum of two semesters and comprising a minimum of three units and a maximum of six units. A final grade is given at the completion of the program. Honors courses count toward the art major as they are taken for a letter grade.

Graduate Program

The Department of Art offers a two-year program of study leading to the M.F.A. degree in Practice of Art.

The B.A. or B.F.A. in studio art or its equivalent is prerequisite to the M.F.A. degree.

For the M.F.A., the student must complete a minimum of four semesters of course work that includes six graduate seminars, one 20th-century art history course, one upper division course, and 24 units of studio and independent study. Students must produce a comprehensive body of creative work, to be exhibited in a final M.F.A. exhibition.

Further information about this program may be obtained from the Art Office, 345 Kroebber Hall.

Lower Division Courses

8. Introduction to Visual Thinking. (3) One hour of lecture and six hours of studio per week. Formerly 8A-8B. A first course in the language, processes, and media of visual art. Course work will be organized around weekly lectures and studio problems that will introduce students to the nature of art making and visual thinking. (F,SP)

12. The Language of Drawing. (3) Six hours of instructional studio and three hours of open studio per week. Prerequisites: 8A or 8B. A study of drawing as a tool for discovering and inventing. The student will learn to see and develop the visual and intellectual skills for 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 have to produce 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. (3) Course may be repeated for credit. Six hours of instructional studio and three hours open studio per week. Prerequisites: 12, 13, 14 or equivalents. Inquiry into concepts of order, process, and content as related to human experience. While faculty contact with students is highly individualized, the course involves group critiques and lectures as well as assigned field trips. (F,SP) Staff

117. Drawing and Composition. (3) Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 12, 13, 14 or equivalents. Inquiry into concepts of order, process, and content as related to human experience. While faculty contact with students is highly individualized, the course involves group critiques and lectures as well as assigned field trips. (F,SP) Staff

118. Figure Drawing. (3) Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 12, 13, 14 or equivalents. Emphasis on the human figure seen in the context of pictorial space, dark and light and color. Various media. Art 116 or 117 is required of all art majors. (F,SP) Staff

120. Approaches to Printmaking: Intaglio. (3) Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 12, 13, 14, and 15 or equivalents. An opportunity to discover and explore an art process with an etching press and a familiarity with such processes as etching, drypoint, aquatint, color, and monotype...
124. Advanced Projects in Printmaking. (3)
Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 12, 13, 14, and 15 or equivalents. In the course of making lithographs, you will be encouraged to find an esthetic direction of your own. Your instructor will also help you develop skill in using both stone and metal plates. (F,SP)

124. Advanced Projects in Printmaking. (3)
Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 10, 12, and 14, plus 6 units of either 120 and/or 122. Non-traditional projects in printmaking. (SP)

130. Approaches to Sculpture: Metal. (3)
Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 12, 13, 14, and 15 or equivalents. The projects will introduce you to a variety of ways in which you can use metal to make spatial structures that will speak to your esthetic imagination. Illustrated talks will acquaint you with the artists whose ideas and processes have changed the nature of metal sculpture in the 20th century. (F)

132. Approaches to Sculpture: Ceramics. (3)
Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 12, 13, 14, and 15 or equivalents. An opportunity to learn the many ways of shaping and giving form to 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. (F,SP)

133. Approaches to Sculpture: Mixed Media. (3)
Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 12, 13, 14, and 15 or equivalents. Further experience with three-dimensional form in real space. The term "mixed media" refers to combining two or more materials to make an image, often ones not normally associated with sculpture making. This will be made clear through both the projects and illustrated talks on such sculpture as found in many cultures. (F)

137. Advanced Projects in Ceramic Sculpture. (3)
Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 12, 13, 14, and 15 or equivalents. Students who are experienced in clay may enroll in this course to continue developing their ideas and their technical command of ceramic materials and processes. (F,SP)

138. Installations. (3)
Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 12, 13, 14, and 15 or equivalents. Installation and site-specific work, indoor and outdoor. Each student will select a site on campus and make a piece for that site. The choice of materials will depend on the exigencies of the site and of the student's interest. (SP)

141. Temporal Structures: Video and Performance Art. (3)
Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 12, 13, 14, and 15 or equivalents. Projects are aimed at understanding and interpreting ways in which time and change can become key elements of works of art. Tape and paper. Regular screenings of professional tapes will illustrate uses of the mediums and provide a historical context. (F)

142. New Genres. (3)
Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: 12, 13, 14, and 15 or equivalents. The course is intended to expose you to the nature and potential of such non-traditional tools for artmaking as performance, video, and audiotape. (F,SP)

150. Art Analysis: Theory and Criticism. (3)
Required of all art majors. Three hours of lecture per week. Prerequisites: 12, 13, 14, and 15 or equivalents and two courses for non-majors in theory or art history. (F,SP)

160. Special Topics in Visual Studies. (3)
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 courses in art history which may be outside of the normal curriculum or be of more restricted content than regular studio courses. An opportunity to investigate theories and mediums on an ad hoc basis when there is another course for the students to do so, providing there is no other course that deals with these concerns. Primarily intended for advanced undergraduates and graduates in Art Practice but open to others. For special topics, enrollment see listings outside of 238 Kroeber. (F,SP)

160A. Art, Technology and Culture. (2)
Two hours of seminar per week. This seminar is held in conjunction with the Art, Technology and Culture Colloquium, a lecture series that presents renowned artists, scientists and scholars from the field of new media. The course will focus on discussion and critique of contemporary issues in the emerging digital medium that arise from the presentations of colloquium speakers. Emphasis will be placed on exploring converging computer strategies and themes inherent in the research and creative work of these interdisciplinary artists, technologists, and theorists, and building conceptual tools for the artistic application. Students are required to participate in colloquium and seminar discussions, do background research on speakers and related topics, and produce critical papers/Net projects. The course is open to undergraduates and graduates from all departments. (F,SP) Packer H195A-H195B. Special Study for Honors Candidates in the Practice of Art. (3-3)
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)

199. Supervised Independent Study for Advanced Undergraduates. (1-3)
Course may be repeated for credit. Course does not satisfy major requirement for art. Hours to be arranged. Must be taken on a pass/no pass basis. (F,SP)

Graduate Courses

Only UC graduate students are allowed to take graduate courses in studio art.

200. Advanced Problems in Drawing. (3)
Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: Graduate standing and consent of instructor. (F,SP)

201. Workshop in Primary Research. (3)
Course may be repeated for credit. Six hours of instructional studio and three hours of open studio per week. Prerequisites: Consent of instructor. This course addresses the investigation of process as it pertains to each graduate student's particular venue. Students will be urged to put much less emphasis on their final product, while becoming more engaged in a broad range of experimentation with materials, concepts and methods analogous to their creative process. Visiting artists, field trips, and material-process demonstrations will be interspersed throughout individual research. This course is required for all first year graduate students. (F, Staff)

202. Advanced Workshop in Printmaking. (3)
Course may be repeated for credit. Nine hours of studio per week. Prerequisites: Graduate standing and consent of instructor. Exploration of individualized problems/ideas in etching, lithography and/or other printmaking processes under supervision of instructor. (In-
Major Program

The major provides an introduction to the history of the visual arts in western and Asian culture as well as the opportunity to do specialized study in areas of the student’s choice. Taking a multidisciplinary and fundamentally humanistic approach, the program provides majors with essential training in the perceptual, research, and critical skills required in many professions. Majors frequently go on to careers in the arts, law, or business as well as to graduate study in the history of art and careers in teaching, museum work, and conservation.

Undergraduate Curriculum. The major in history of art consists of no fewer than 12 courses, and must include the following:

1. Any three lower division lecture courses in the history of art;
2. One lower or upper division course in the practice of art;
3. Five upper division lecture courses in five of six fields presently taught in the department: Asian; Greek and Roman; Medieval; 15th and 16th centuries; 17th and 18th centuries; 19th and 20th centuries. One of these courses must be in Asian art unless the student has already taken a lower division course in this field;
4. Two additional upper division courses in the history of art, one of which must be a seminar;
5. One upper division course outside the department, related to the student’s main focus of study; this course must be approved in advance by a departmental undergraduate major adviser.

All courses must be taken for a letter grade.

Honors Program. Students with at least a 3.5 grade-point average both overall and in all upper division courses taken to fulfill the requirements of the major are eligible for admission into the Honors Program. Candidates for honors in the History of Art are required to complete satisfactorily, within their senior year, an honors thesis, consisting of at least two semesters of completing academic work under faculty supervision (usually a seminar, directed research, or independent study course in the first semester plus, in the second semester, an H195/196 seminar). Those who have completed the program will graduate with honors, high honors, or highest honors in the major depending upon their final GPAs in upper division courses taken to fulfill the major requirements. Applications, which require the signature of the project director and under- graduate major adviser, are available in the History of Art office.

Minor Program

Required: Five upper division courses in at least three of the six fields presently taught in the department: Asian; Greek and Roman; Medieval; 15th and 16th centuries; 17th and 18th centuries; 19th and 20th centuries. One course may be an upper division undergraduate course; the rest must be lecture courses. All courses must be taken for a letter grade. An overall GPA of 2.0 is required in all courses applied to the minor. A minimum of three courses must be graduate. The minor is not open to practice of art majors.

Recommended: R1B and two other lower division art history survey courses (11, 30, 31, 35, 62, 81) and one course in the practice of art, preferably drawing.

Graduate Study

The department offers a two-stage integrated masters and doctoral program in preparation for college teaching, writing, and specialized curatorial careers. Students are not admitted to work specifically for the M.A. degree, although it may be awarded to those working toward the Ph.D. after fulfillment of the requirements for Stage I of the M.A./Ph.D. program.

Preparation and Application for Admission

1. Undergraduate Training. Applicants must hold a Bachelor of Arts or its equivalent from an institution of acceptable standing. An undergraduate major in the history of art is not necessary. Students with high academic achievement in history, literature, practice of art, or similar humanistic disciplines are welcome. Those with little or no work in the history of art may have to complete some additional study to meet breadth requirements.

2. Post-M.A. Transfer Students. Applicants applying with an M.A. degree in history of art or a closely related field from another institution must submit their M.A. thesis or two substantial research papers with their application.

3. Statement of Purpose. Students should be as precise as possible in describing their intellectual background and interests in the field of art, their expectations for graduate study at Berkeley, and their academic and career goals.

4. Languages. Students are expected to be proficient in one or more of the appropriate foreign languages when they begin graduate study. The specific languages will vary according to the field of study (see Languages, below). Students are strongly urged to do everything possible to satisfy both language requirements before entering the program. The department is particularly recommended as a time to improve language proficiency.

5. Graduate Division Requirements. Applicants are encouraged to become familiar with Graduate Division regulations as described in the beginning sections of this catalog, specifically regarding GRE and TOEFL examinations, and minimum grade-point average.

Requirements for Completion of Stage I of the M.A./Ph.D. Program

1. Breadth. (a) Students of Western art: one upper division course or seminar in Asian art and in four of the following areas: Ancient; Medieval; Renaissance; 14th-15th centuries (1300); 16th century (1500) to present; (b) Students of Asian art: one upper division course or seminar in each of the three Asian areas (Japan, China, and India/Southeast Asia), and at least two upper division courses or seminars in one or two of the areas of Western art listed above in (a). These requirements may be satisfied by previous course work at the undergraduate level.

2. Course Work. Ten courses selected to fulfill breadth requirements above (if necessary); at least five must be graduate-level art history courses, including three graduate seminars taught by department faculty. One of the preceding courses can count as a seminar in connection with teaching (History of Art 300) and another to prepare the qualifying paper or M.A. thesis (History of Art 601). Additional courses may include upper division undergraduate courses, if the proseminar is designed especially for first-year graduate students (History of Art 200); additional graduate seminars inside or outside the department; and an individual study on selected topics (History of Art 299).

3. Languages. Two are required: (a) Students of Western art: German and French, Italian, Dutch, Latin, or Greek. In certain cases the graduate adviser may approve the substitution of another language for French or Italian. (b) Students of Asian art: one European language (normally French or German), and one major Asian language (normally Chinese, Japanese, Sanskrit, or Hindi), or two Asian languages (one list and one determined in consultation with the graduate adviser). (c) Students of ancient art: German; Greek and Latin. (N.B. German and either Greek or Latin are required to complete stage I. The third language must be mastered by the completion of the Ph.D.)

4. Qualifying Paper or M.A. Thesis. The qualifying paper is a perfected version of a seminar paper, or a paper evolving out of independent research, normally no longer than 20 pages including footnotes and bibliography. It should demonstrate scholarly competence in the investigation of a limited problem. The qualifying paper is revised and approved by three departmental faculty members. The paper is to serve as a thesis for the M.A. degree, it must be submitted in accordance with Graduate Division regulations and be approved by a committee of three readers, two of whom usually are members of the qualifying paper committee, and one of whom must be from another Berkeley department. Application for the M.A. degree must be obtained from the Graduate Division or Graduate Assistant, and must be filed by the end of the third week of instruction in whichever semester the degree is expected. All degrees are awarded in December.

5. Proceeding to Stage II. (a) Students enrolled in the M.A./Ph.D. program at Berkeley: The qualifying paper is submitted for discussion by the whole faculty as part of a general review of the student’s work so far. For this review the student submits a petition, in the form of a letter addressed to the graduate adviser, outlining work accomplished in Stage I and plans for Stage II, including field of concentration, and requesting permission to begin Stage II. Petitions are accepted four times a year. (b) Post-M.A. transfer students: Students must complete at least one year of course work, including at least two graduate seminars with department faculty. They also must be reviewed by the faculty before the end of the first year. For this review, the student submits a petition to begin Stage II, including field of concentration and requesting permission to begin Stage II. The basis for this review will be the M.A. thesis (or equivalent) and course and seminar work during the first semester at Berkeley. The faculty may require submission of a written seminar work, in which case the student will be notified in advance. Petitions are accepted four times a year.

6. Graduate Student Instructors (GSIs). Since teaching is considered an important part of graduate study, each student is strongly urged to do everything possible to satisfy the GSIs. Appointments are made in the spring semester for
the following year. Entering students are normally not eligible during their first year’s residence, unless they have already had teaching experience elsewhere. To qualify as a GSI, students in Western art must have satisfied both language requirements, and all students must have made any incompletes by the time teaching is to begin. All students are required to attend several orientation workshops. In addition, first-time international GSIs must pass an examination to demonstrate English language proficiency.

7. Length of Stage I. For students in Western art other than classical, good progress means two years, or two years and a summer; for Asian or classical art, three years. (Although it is not required, students should expect to spend summers studying languages, working on the qualifying paper, or travelling to study works of art.)

8. Length of Stage II. Good progress means one year to the qualifying examination, plus three or four additional years for research and completion of the dissertation. Stage II and Stage III is six to seven years (seven to eight years for students of Asian or Classical art).

9. Qualifying Examination. The examination is conducted by a five-member committee nominated by the student and advisers and appointed by the department. The Berkeley Divisions on behalf of the Graduate Council. This committee is normally the Colloquium Committee plus a chair from the department. The exam consists of one three-hour written part followed a few days later by an oral examination, and includes consideration of specific works of art, sources, and the state of scholarship in the field. The examination tests the student’s basic knowledge within a general field, detailed knowledge of special topics within it, and the ability to integrate studies in an appropriate outside field with work in the History of Art. When the qualifying examination is passed students are given a certificate of qualifications, and upon satisfactory performance in the Berkeley Spring Quarter may be appointed to a dissertation committee. At the Graduate Division, the student is formally advanced to candidacy. The only further requirement is the dissertation.

5. Dissertation. The dissertation is a book-length study of a major aspect of the history of art with the supervision of a dissertation committee. The dissertation committee is nominated by the graduate adviser following consultation with the student. It consists of three Academic Senate members from the Berkeley campus, one of whom must be from outside the department. Dissertations of more than 50,000 words must submit the first 10 chapters to the committee, together with an associated methodological report. Normally the committee must receive the entire dissertation at least three months before the filing deadline.

6. Dissertation Writing Colloquium (History of Art 296). In order to break down the isolation of dissertation writing, establish dialogue among advanced graduate students, produce an environment in which students can develop their ideas and improve mentoring between advisers and students, and all students in residence who have passed their qualifying exams and have written at least a first chapter of their dissertations, students will be enrolled in the colloquium. The colloquium will meet at regular intervals throughout the academic year, and produce two or three chapters. Enrollments in the colloquium are expected at least two chapters have been produced (normally two semesters), but students are encouraged to enroll and present chapters until the dissertation is completed. Colloquium members also will be encouraged to take part in campus symposia such as the Berkeley Symposium.

7. Annual Review of Ph.D. Candidates. All doctoral students at the dissertation stage must meet with a departmental committee of the dissertation committee. The committee is to review and evaluate progress on the dissertation and to map out a plan for the next year. Students who are away from campus may complete the evaluation process by mail.

8. Deposit of Chapters. Chapters of the dissertation will be submitted to the committee, together with a progress report and a table of contents. Normally three or four chapters should be submitted to the committee, together with appropriate illustrations, as they are written. Normally the committee will meet the entire dissertation at least three months before the filing deadline.

9. Final Examination. The final examination of the dissertation is open to the department and may be taken orally or in written form. The dissertation committee will normally consist of five members. It may consist of four members if one of the members is a member of the Berkeley faculty and the remaining members are outside the department.

10. Approval and Submission. Normally the committee must receive the entire dissertation at least three months before the filing deadline.

11. Deposit of Chapters. Chapters of the dissertation will be submitted to the committee, together with a progress report and a table of contents. Normally three or four chapters should be submitted to the committee, together with appropriate illustrations, as they are written. Normally the committee will meet the entire dissertation at least three months before the filing deadline.

12. Final Examination. The final examination of the dissertation is open to the department and may be taken orally or in written form. The dissertation committee will normally consist of five members. It may consist of four members if one of the members is a member of the Berkeley faculty and the remaining members are outside the department.

13. Approval and Submission. Normally the committee must receive the entire dissertation at least three months before the filing deadline.
broader visual traditions, historical contexts, and social/cultural issues. Wherever possible, newly discovered work will be illustrated and discussed. (F,SP) Stewart

62. Introduction to Italian Renaissance Art. (4) Four hours of lecture and one hour of discussion per week. Using a few selected examples drawn from Florence, Rome, Milan, and Venice, this course will introduce most types of art and architecture produced in the Italian Renaissance — from butrinty squares, churches, palaces and libraries, and their painted and sculptural decoration. Special attention will be paid to various approaches used in interpreting works of art.

81. Introduction to Modern Art (for Non-Majors). (4) Designed for students with no previous study of visual arts. Two hours of lecture and two hours of discussion per week. Selective survey of major developments in painting, sculpture, graphic arts, photography, architecture and design, primarily from about 1890 to about 1960. Emphasis on detailed analysis of examples in the Bay Area, on developing critical and writing skills.

Upper Division Courses

100. 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, Pausanias) but also modern approaches, from traditional style analysis and connisseurship through the "founders" of modern art history (Panofsky, Riegl) to more recent developments, e.g., psychoanalysis, feminism, social history, anthropology, semiotics, etc.

102. Individual Careers. (4) Course may be repeated for credit as topic varies. Three hours of lecture and one hour of discussion per week. An intensive consideration of a single artist’s career. Detailed descriptions of current and future offerings available in room 416 Doe Library.

104. Gender and Representation. (4) Course may be repeated for credit as topic varies. 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.

106. Economies of Art. (4) Course may be repeated for credit as topic varies. Three hours of lecture and one hour of discussion per week. An analysis of the effect of economic factors on the creation, content, reception, and value of works of art. Topics may include patronage, art market, display, marketing, consumerism, etc. 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. A consideration of the relationship between art and religion and the ideology of the city. Specific attention, wherever possible, will be paid to newly-discovered work.

110A. 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.

130B. Early Chinese Painting. Part II. (4) Three hours of lecture and one hour of discussion per week. Chinese art in the medieval period: Six Dynasties through Sung Dynasty (third - thirteenth centuries A.D.), especially Buddhist sculpture, ceramics, tomb figurines, and metawork and other "minor arts."

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 ca. 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).

134. The Arts of the Japanese Temple. (4) Three hours of lecture and one hour of discussion per week. Primarily the architecture and sculpture of Japanese Buddhist temples, 7th to 13th centuries.

135A. Early Japanese Painting. (4) Three hours of lecture and one hour of discussion per week. The three main topics within a careful survey are Buddhist painting; narrative scroll; and painting in the Zen milieu.

135B. Later Japanese Painting. (4) Three hours of lecture and one hour of discussion per week. There are three major themes: decorative screenpainting (in its architectural context); genre painting and ukiyo-e; and literati and literaturn painting (bunjin-ga). Levine and Eileen.

135A. 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 development of (pictorial) narrative, the evolution of style and iconography and problems of dating.

135B. The Art of India: 500-1530 A.D. (4) Three hours of lecture and one hour of discussion per week. A survey of Indian sculpture and architecture in India from the sixth to fourteenth centuries.

136C. Painting in India and Pakistan, 1100-1900. (4) Three hours of lecture and one hour of discussion per week. The class will follow the development and interaction of Indian and Buddhist/Hindu book illustration under the patronage primarily of Mughal and Rajput courts. Indianistic artistic systems and the role of individual painters will be considered. Also listed as South and Southeast Asian Studies C110. (F,SP)

137. The Art of Southeast Asia. (4) Three hours of lecture and one hour of discussion per week. 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 elements.

141. The Art of Ancient Greece. Three hours of lec- ture and one hour of discussion per week. In addition to close study of the major works, particular emphasis upon the cultural context and key issues such as narrative strategies, gender and the body, modes of address in sculpture and painting, and 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 330 to 30 B.C.

142. Art and the Body in Ancient Greece. Three hours of lecture and one hour of discussion per week. This course considers key issues concerning the body in ancient Greek culture from a visual perspective. Topics include the issue of nakedness in Greek life and art; Athenian and Spartan ideals of the body; Polykleitos’ Doryphoros and Praxiteles’ Knidian Aphrodite; the body as political metaphor; and the an- tisocial body.

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 Con- stantine the Great.

151. Art in Late Antiquity. (4) Four hours of lecture per week. Imperial art from Gallienus through the col- lapse of the western empire. Christian art from the beginning around 200 through the age of Justinian. Re- vivals in the seventh and eighth centuries. A look back from the court of Charlemagne and contemporary Con- stantineople.

154. Byzantine Art. (4) Three hours of lecture and one hour of discussion per week. Art and architecture of the Byzantine Empire, especially from the 8th to 14th century. Topics include the development of the icon; iconoclasm; programs of mosaic de- coration; imperial, monastic and private patronage; picto- rial innovation; Byzantine art and the Renaissance in Europe.

155. Romanesque Art. (4) Three hours of lecture and one hour of discussion per week. The visual arts in Eu- rope from about 1050 to 1150 A.D., especially sculptu- re in France and Spain. Arts related to the monas- teries and pilgrimages, and the new forms of discourse pertaining to sanctity, history, social order, the exotic, and the end of the time.

156A. Gothic Art in Northern Europe: 1150-1270. (4) Three hours of lecture and one hour of discussion per week. Gothic art and architecture from its origins in France about 1150. Emphasis on the related de- velopments of architecture, sculpture, and stained glass at the major cathedrals, the impact of the early universities and scientific study, and the political role of the visual arts in the early nation states.

156B. Gothic Art in Northern Europe: 1270-1400. (4) Three hours of lecture and one hour of discussion per week. The visual arts, both sacred and secular, public and private, especially in the courts of Valois France and Plantagenet England.

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 Flo- rentine Renaissance painting, sculpture, and architec- ture organized by genre. Particular emphasis on the relationship between art and religion and the ideology of Florentine republican and ducal absolutism. Is- sues 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 Ro- man Renaissance painting, sculpture, and architecture or- ganized by genre. Particular emphasis on the relation- ship 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 or- ganized by genre. Particular emphasis on the rela- relationship between art and religion and the ideology of the Venetian communes. Issues of gender, the status of
artists, and the function, audience, and patronage of art will also be considered.

166. van Eyck to Brueghel. (4) Three hours of lecture and one hour of discussion per week. The great age of Netherlandish art, from its roots in manuscript illumination and the early masters of panel painting through van Eyck, Van der Weyden, Bosch, Brueghel) up to the time of the iconoclasm of 1566. Focus on the relation of painting to the beholder; iconic vs. narrative images; rise of expression of social and economic ideals; and class and gender issues.

170. Southern Baroque Art. (4) Three hours of lecture and one hour of discussion per week. The major artists (among them Caravaggio, Bernini, Velazquez, and Titian) and the major concerns (including genre subjects such as history painting, landscape, low-life, and notions of illusion and illusionism) of seventeenth-century art in Italy, France, and Spain.

172. The Dutch Golden Age. (4) Three hours of lecture and one hour of discussion per week. The rise of a rich visual culture in 17th-century Holland that expressed the ideals, aspirations, and identity of the first bourgeois capitalist society. Rembrandt, Vermeer, and others in the context of contemporary aesthetic concerns (realism, optics) and social issues (domestic values, poverty and wealth, colonialism, national identity).

173. The Age of Rubens. (4) Three hours of lecture and one hour of discussion per week. The culture of early 17th-century Europe as it was known (and created) by Sir Peter Paul Rubens, painter, scholar, and diplomat. Begins in Flanders (Rubens) in Italy, Spain, France and England, examining politics, religion and visual culture in each place. Key issues include the concept of artistic tradition; art and politics; crafting social status; workshop practice.

176. European Art in the 18th Century. (4) Three hours of lecture and one hour of discussion per week. Topics from 18th-century European art, either focusing on the art of one nation, for example, France, Spain or England, or introducing the art of Europe as a whole.

178. American and British Art (1550-1800). (4) Three hours of lecture and one hour of discussion per week. Formerly 183A. This course considers architecture, painting, decorative arts, and city planning in England, the New World colonies, and Federal America. Focusing on production, patronage, and the social context of art, major monuments and major schools are addressed from multiple perspectives. Museum field trip.

180A. Nineteenth-Century Europe: Age of Revolutions. (4) Three hours of lecture and one hour of discussion per week. Topics in late 18th- and early 19th-century European art, either focusing on a pertinent theme, and/or nation (e.g. Romanticism and gender in France) or introducing the art of Europe as a whole during this tumultuous period of revolution and reaction.

180B. Nineteenth-Century Europe: Realism and Modernity. (4) Three hours of lecture and one hour of discussion per week. The arts in Europe in the mid-19th century, with reference to the capitalist class and its environs. May focus on Paris, or on Paris’s rivalry with other European centers.

180C. Nineteenth-Century Europe: The Invention of Avant-Gardes. (4) Three hours of lecture and one hour of discussion per week. The arts in the late 19th century. Impressionism and after. The nature of avant-garde culture and its relation to emerging consumer culture. May emphasize Paris, or the struggle for cultural mastery in Europe.

181. French Art of the 19th Century. (4) Three hours of lecture and one hour of discussion per week. Formerly 182. Introduction to French art from the Revolution to the First World War. Focus on art of the period. Lectures on art history, visual culture, and the role of art in society.

182. Histories of Photography. (4) Three hours of lecture and one hour of discussion per week. Formerly 188. Topics in 19th- and 20th-century histories of photography; for example, photography in relation to modernism, gender, pictorial genres, or consumerism.

183. Art and Colonialism. (4) Three hours of lecture and one hour of discussion per week. Consideration of the relationship between visual representation and conquest, colonialism, and imperialist strategies. Topics include the history of visual ethnographies, representations and constructions of “race,” exoticism, orientalism, and primitivism.

184. Art in Consumer Society. (4) Three hours of lecture and one hour of discussion per week. An introduction to modern art with particular emphasis on its relation to phenomena of mass society such as technology, the commodity, communication media, capitalism, fascism, etc.

185A. American Art (1900-Pre). (4) Three hours of lecture and one hour of discussion per week. Looking at major developments in architecture, decorative arts, photography, and painting from Romanticism to post-modernism, this course addresses art and its social context over the last two centuries in what is now the United States. Issues include patronage, audience, technology, and the education of the artist as well as style and cultural expression. Field trips.

185C. Contemporary American Art. (4) Three hours of lecture and one hour of discussion per week. In-depth study of American art from 1960 to the present, with particular attention to theoretical issues and the intersections of art with the culture at large. Previous course work in History of Art recommended.

186A. Art in the Early 20th Century. (4) Three hours of lecture and one hour of discussion per week. Prior to World War I. Focus on the influence of two major artistic and cultural events: the Armory Show and the Mexican Revolution.

186B. Art in the Mid-20th Century. (4) Three hours of lecture and one hour of discussion per week. Art between the world wars and in the later 1940s and 1950s. The focus may be on Europe or on Europe-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 to the present day. Emphasis includes conceptual, video, and performance art, as well as traditional media.

C189. The American Forest: Its Ecology, History, and Representation. (4) Three hours of lecture and one hour of discussion per week. An examination of the history of visual ethnographies, representations and the intersections of art with the culture at large. Previous course work in History of Art recommended. This course encourages students to integrate the arts into their intellectual pursuits and develop lifelong habits of involvement in and appreciation of the fine arts.

190F. 19th-20th Century Visual Art. (4) Three hours of lecture per week for three weeks for one-half unit. Two hours of lecture/screenings per week for six weeks for one unit. The focus of this course varies based on the exhibition openings, and performances being presented at the Berkeley Art Museum, Pacific Film Archive, and Cal Performances. The work of well-established artists is used to illustrate historical trends; emerging artists illustrate cutting-edge developments. This course encourages students to integrate the arts into their intellectual pursuits and develop lifelong habits of involvement in and appreciation of the fine arts.

192. Undergraduate Seminar: Problems in Research and Interpretation. Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Primarily for juniors and seniors in the major or consent of instructor. Concentration on specific problems in a particular area of art history. Assigned readings, discussion, and a substantial paper. For specific topics and enrollment, see listings outside 416 Doe Library.


193. Directed Research. (4) Prerequisites: Consent of instructor and departmental approval for advanced undergraduates wishing to continue research on topics already begun in a lecture or seminar or to pursue at a high level specialized 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 of fieldwork per week plus conferences. Must be taken on a pass/no-pass basis. Prerequisites: Approval of undergraduate advisor; 192H recommended. Study and practical professional experience, usually for no fewer than 10 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. Internships ordinarily must be arranged well in advance; for further information, inquire at 416 Doe Library.

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. For advanced undergraduates majoring in the arts and satisfying the requirement for a major field research program 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 produce a final paper for the course consisting of no fewer than 35 pages. Other restrictions apply; see faculty adviser. Also listed as Undergraduate Interdisciplinary Studies C196W, Women’s Studies C196W, Mass Communications C196W, Political Science C196W, History C196W, Political Economy of Industrial Soc C196W, and Sociology C196W.

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Individual conferences.
200. Graduate Proseminar in the Interpretation of Art Historical Materials. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Graduate standing and consent of instructor. An introduction to the fundamentals of art history, including traditional and methodological approaches, with a discussion of candidates for higher degrees. Offerings vary from year to year. Students should consult the department’s “Announcement of Classes” for offerings before the beginning of the semester.

200X. Special Topics: Short Course. (2) Course may be repeated for credit. Four hours of lecture/seminar per week. Must be taken on a satisfactory/unsatisfactory basis. A four-week long course permitting the instructor to present a topic of particular interest. Topics and instructors vary; consult department course description for details.

201. Museum Philosophy and Practice. (4) Three hours of seminar per week plus field trips and outside work. Prerequisites: Consent of instructor. Introduction to the historical, philosophical, and methodological problems of art museums including film and video for graduate and advanced undergraduate students in history of art, history of film, art practice, and related disciplines. Emphasis on conservation and curatorial skills. Visits to Bay Area museums, conservation center, and media workshop.

202. Seminar in Material Culture: The Interpretation of Objects. (2,4) 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 commodities or as cultural texts. Taught by two faculty members who have extensive experience as museum curators—one of American Art, the other of Asian Art, this class will combine theory with hands-on learning. (FSP) Berger, Lovell

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 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

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 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

236. Seminar in the Art of India. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

240. Seminar in Ancient Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

244. Seminar in Roman Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

254. Seminar in Early Medieval Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

256. Seminar in Byzantine Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

257. Seminar in Romanesque and Gothic Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

258. Seminar in Late Medieval Art in Northern Europe. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

260. Seminar in Italian Renaissance Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

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 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

265. Seminar in Northern Renaissance Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2.0 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 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

275. Seminar in 18th-Century Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2.0 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 2.0 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 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

286. 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 2.0 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

290. Directed Dissertation Research. (3-12) Course may be repeated for credit. Independent study. Must be taken on a satisfactory/unsatisfactory basis. Independent study open to qualified students directly engaged upon the doctoral dissertation.

299. Special Study for Graduate Students in the History of Art. (1-12) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for master’s degree. Individual study in consultation with the graduate adviser.

601. Individual Study for Master’s Students in the History of Art. (1-12) Course may be repeated for credit. 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 advisor, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. degree. (FSP)

Professional Courses

300. Teaching the History of Art. (1-5) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and concurrent appointment as a graduate student instructor. Weekly meetings with the instructor to discuss the methods and aims of the course, to plan the content and presentation of the material for the discussion sections, and to set standards and criteria for grading and commenting upon papers and exams. In addition, after visiting sections early in the semester, the instructor will discuss with each GSI individually his or her performance and make any necessary recommendations for improvement.

Asian American Studies

(College of Letters and Science)

Program Office: 556 Barrows Hall, (510) 643-0796
Chair: Jose David Saldivar, Ph.D.
Professors
Evelyn N. Glenn, Ph.D. Elahe H. Kim, Ph.D.
Ann K. Roberts, Ph.D. Sau-ling C. Wong, Ph.D.
Associate Professors
Richard Omi, Ph.D. L. Ling-chi Wang, M.A.
Assistant Professor
Katharya Um, Ph.D.
Lecturers
Anna Leong, M.A. Jeroen T. Takahashi, Ph.D.
Undergraduate Major Adviser: Mr. St. Germaine.

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 covered in the curriculum by developing an individual program of study supervised by a faculty member. Study may involve 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.

Prerequisites: Graduate standing and consent of the instructor.
Undergraduate Program

The Asian American Studies Program offers a unified and comprehensive undergraduate curriculum designed to make at least three major contributions. First, it prepares students for positions of service and leadership in Asian American communities. To do this, the program draws heavily on the resources and programs of the various schools and departments at Berkeley to include instruction which reflects the conditions of Asians and other Third World people living in America.

Major Requirements

Note: Some of the courses included in the major curriculum are pending approval. Please consult the online catalog or a departmental adviser for further information.

The major in Asian American studies consists of 12 courses for a total of 48 units.

Lower Division. Ethnic Studies 10A, 10B; Asian American Studies 20A, 20B.

Upper Division. Ethnic Studies 101A, 101B, and 103; completion of two elective courses, selected with the help of the student’s faculty adviser, from existing curriculum in history, community studies, and culture; Asian American Studies 195A and 195B; Asian American Studies 197 (4 units cumulative).

Honors. The Asian American Studies Program provides an option leading to the A.B. degree with honors. To be recommended for honors, students must have (1) completed at least 30 units and two semesters with grade-point averages of at least 3.3 for all work undertaken in the Asian American Studies Program, and (2) been approved specifically for honors by the Department of Ethnic Studies chair and the Asian American Studies co-ordinator upon recommendation by the faculty adviser for the major. Honors students must complete H195, the senior honors seminar for Asian American studies majors. To graduate with an A.B. with honors, students must obtain at least a 3.3 GPA for all course work undertaken at the University.

The Minor

Note: Some of the courses included in the minor curriculum are pending approval. Please consult the online catalog or a departmental adviser for further information.

Requirements. The minor in Asian American studies consists of five upper division courses for a total of 20 units: Ethnic Studies 101A or 101B; completion of four upper division Asian American elective courses (not including Asian American Studies 197).

Upper Division Courses

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 examines literary works by Asian American, African American, Chicano, and Native American writers in their political and social contexts, focusing on similarities and differences between the experiences of ethnic minorities. The emphasis is on an interpretative and sustained analytical writing. Satisfies 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 present. Topics include an analysis of the Asian American experience: historical, political, social and economic issues they confront. The diverse range of communities, both suburban and urban, will be surveyed and situated within a domestic and global context. (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.

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 to semester. Enrollment limited to 15 freshmen. (F,SP) Staff

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/failed basis. Prerequisites: Consent of instructor.

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 work per week per unit. Must be taken on a pass/failed basis. Prerequisites: Consent of instructor. (SP) Staff

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. Three hours of independent study per week per unit. Must be taken on a pass/failed basis. Prerequisites: Consent of instructor. Individual research on a topic which leads to the writing of a major paper. Regular meetings with faculty supervisor. (F,SP) Staff

Upper Division Courses

120. Comparative History of Asian American Experiences in America. (4) Three hours of seminar per week. Prerequisites: 20A or equivalent. Analysis of the similarities and dissimilarities of the Asian American experience in America; methods of comparative historical research. (SP)

121. Chinese American History. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 20A or equivalent. Chinese American history, 1848 to present. Topics include influences of traditional values, Eastern and Western patterns of immigration and settlement; labor history; 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 one hour of discussion per week. Prerequisites: 20A or equivalent, This course will be presented as a proseminar to give students an opportunity to participate in the dynamics of the study of Japanese American history. Topics to include immigration, anti-Japanese racism, labor, concentration camps, culture, art and literature, and personality and culture. (SP)

123. Korean American History. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 20A or equivalent. Koreans in America from 1870 to the present. Topics include immigration and settlement patterns; labor and socio-economic life; political activities; community organization; and issues related to the contemporary population inflow. (SP)

124. Filipino American History. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 20A or equivalent. Topics include consequences of the Spanish-American War on Filipino emigration; conditions in Hawaii and California and the need for Pilipino labor; community development; changing relations between the U.S. and the Philippines; effects of independence movement and World War II on Pilipino Americans; and contemporary issues. (F,SP)

125. Contemporary Issues of Southeast Asian Refugees in the U.S. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 20A or equivalent. This course will introduce students to the sociocultural, economic, and political issues facing Southeast Asian refugees in the U.S. While the course focus is on the Asian American experience, references will be made to the pre-migration experiences and histories of the Southeast Asian refugee groups. The processes and problems in the formulation of refugee programs and services in the U.S. also will be addressed in their implications for refugee resettlement and the refugee experience. Emphasis will be placed on comparative analyses of the Southeast Asian refugee communities.

126. Southeast Asian Migration and Community Formation. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 20A or equivalent. This course will examine Southeast Asian migration and resettlement in the U.S. in the context of the United States involvement in Vietnam, Laos, and Cambodia during the Vietnam War. It will also address the post-war “legacy” and their impact on the ethnic minorities and politics of the three countries as well as neighboring states in the region. Asylum politics and refugee camp experiences will be addressed in the discussion of the formation of policies and of the adaptation of Southeast Asian refugees. (SP)

127. South Asian American Historical and Contemporary Issues. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 20A or equivalent. Examines immigration and social history of South Asian Americans from the early 20th century to present. Development of South Asian American communities within the social, political and economic contexts of South Asia and the U.S. (SP)

130. Asian Americans and Foreign Policy. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 20A or consent of instructor. This course is an introduction to the political, economic, and cultural relations between the United States and Asia and their 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 international events that shaped the Asian American experience and influenced the emergence and development of Asian American communities. (SP)

131. Asian Diaspora(s) from an Asian American Perspective. (4) Three hours of lecture and one hour of discussion per week. Analyzes the global presence of an Asian group with a significant U.S. population:
permit them to focus on a single geographical area, making use of a wide range of disciplines.

**Prerequisite Courses in the Major**

Students petitioning to enter the group major must have completed the following:

1. One year (two semesters) of a language appropriate to the area of regional specialization (Area I—China; Area II—Japan; Area III—Southeast Asia; Area IV—The Indian Subcontinent).


**Additional Major Requirements**

Once accepted in the major, the student is expected to select an area focus (Area I—China; Area II—Japan; Area III—Southeast Asia; Area IV—The Indian Subcontinent) and a disciplinary focus within that area, and is required to complete the following course work:

1. One additional year of language appropriate to the area of regional specialization. After this second year, further study of the language at the upper division level is encouraged and will count toward the major unit requirement as indicated in the following sections. Note that, in the case of Malay/Indonesian, Tagalog, Vietnamese, Hindi-Urdu, Punjabi, Tamil, and Thai, all or part of the first two years’ work carries upper division credit. In this instance, the first two years’ work will satisfy the language requirement but will not count toward the major unit requirement.

2. Completion of a minimum of 36 units of upper division course work in at least two departments, including:
   a. Disciplinary Focus. At least 12 of the 36 units must be in one department (not a language department) and must include one course which relates to the theories, methods, and techniques of that discipline, but which is not exclusively an area studies course.
   b. History Requirement. One upper division course must be a course in Asian history of the area appropriate to the student’s regional focus.
   c. Optional Senior Thesis. Qualified students may complete a senior thesis approximately 50 pages in length under the supervision of the major advisor or other appropriate faculty member. Three units of upper division credit in Asian Studies 196 will be given for work on the thesis.

**Area I: China**

A. The student must complete one additional year of Chinese (Mandarin). Further study of the language is encouraged and will count toward the major unit requirement as indicated below.

B. The student must select one of the following disciplinary foci and complete at least 12 units of work from the courses listed there (see item 2 under “Additional Major Requirements” above).

**Anthropology**

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major advisor.

2. Anthropology 170, China (4); Anthropology 123D, Archaeology of East Asia (4).

**History**

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major advisor.

2. Two courses from among the following: History 116A-116B-116C, China (4,4,4); History 117, Social History of China (4).

**Economics**

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major advisor.


3. Two or three other courses chosen with the consent of the major advisor, to equal 12 upper division units in economics.

**Political Science**

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major advisor.

2. Two courses from among the following: Political Science 128, Chinese Foreign Policy (4,4); Political Science 129C, Communist and Post-Communist International Relations (4); Political Science 137A, Revolutionary Change (4); Political Science 137B, Revolutionary Movements (4); Political Science 140B, Comparative Communism (4); Political Science 143A-143B, Northeast Asian Politics (4,4); Political Science 144A, Rapid Growth in East Asia (4).

**Sociology**

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major advisor.

2. Sociology 172, Development and Modernization (4); and Sociology 183, Contemporary Chinese Society (4).

C. Additional units necessary to complete the unit requirement of the major may be selected from among the courses listed under other disciplinary foci above and from among the following:

- Asian Studies 147, Inside Revolutionary China (4); 148, China Reporting (4); 149, Media and Society in Contemporary China (4); 150, Topics in Asian Studies (when on China) (4); Comparative Literature 160, Chinese Literary Practice and the West (4); Geography 166, China and Central Asia (4); Legal Studies 161, Law in Chinese Society (4); Music 134A, Music of the East Asia Tradition (4); Philosophy 151, Early Chinese Thought (4); Philosophy 152, Later Chinese Thought (4); Philosophy 153, Chinese Philosophy (4).

D. Up to 16 units of the major requirement may be elected from the following language and literature courses offered by the Department of East Asian Languages:

- Chinese 100A-100B, Advanced Chinese (5,5); Chinese 101, Fourth-Year Readings: Literature (4); Chinese 102, Fourth-Year Readings: Social Sciences and History (4); Chinese 120, Ancient Chinese Prose (4); Chinese 122, Ancient Chinese Prose (4); Chinese 132, Readings in Early Medieval Literature (4); Chinese 134, Readings in Later Medieval Poetry (4); Chinese 136, Readings in Late Medieval Prose (4); Chinese 138, Readings in Chinese Drama (4); Chinese 140, Readings in Chinese Buddhist Texts (4); Chinese 155, Modern Chinese Literature (4); Chinese 157, Contemporary Chinese Literature (4); Chinese 181A-181B, Chinese Literature in Translation (4,4); Chinese 188, Chinese Popular Culture in 20th-Century China (4); Buddhism 181, Development of Buddhism in East and Inner Asia (4); Buddhism 182, Buddhism and Contemporary Society (4).

E. A minimum of one upper division course in Chinese history, which may overlap with the history disciplinary focus.

F. In exceptional cases, individual waivers of specific course requirements for valid academic reasons will be considered with the approval of the major advisor.

**Area II: Japan**

A. The student must complete one additional year of Japanese. Further study of the language is encouraged, and will count toward the major unit requirement as indicated below.

B. The student must select one of the following disciplinary foci and complete at least 12 units of work from the courses listed there (see item 2 under “Additional Major Requirements” above).

**Anthropology**

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major advisor.

2. Anthropology 171, Japan (4).

3. One of the following courses: Anthropology 123D, Archaeology of East Asia (4); Anthropology 149, Psychological Anthropology (4); Anthropology 151, Anthropology of Tourism (4).

**History**

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major advisor.

2. Two courses from among the following: History 118A-118B-118C, Japan (4,4,4); History 119, Topics in Japanese History (4).

**Political Science**

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major advisor.

2. Two courses from among the following: Political Science 143A-143B, Northeast Asian Politics (4,4); Political Science 144A, Rapid Growth in East Asia (4).

C. Additional units necessary to complete the unit requirement of the major may be selected from among the courses listed under other disciplinary foci above and from among the following:

- Asian Studies 150, Topics in Asian Studies (when on Japan) (4); Geography 168, Japan and Korea (4); History of Art 134, The Arts of the Japanese Temple (4); History of Art 135A, Japanese Painting to 1600 (4); 135B, Japanese Painting of the Muromaya and Tokugawa Periods (4); Music 134A, Music of the East Asia Tradition (4); Music 134B, Music of Japan (4).

D. Up to 16 units of the major requirement may be elected from the following language and literature courses offered by the Department of East Asian Languages:
Area III: Southeast Asia

A. The student must complete one additional year of Malay/Indonesian, Tagalog, Vietnamese, or Thai. In exceptional cases, Dutch, French, or Spanish may, with permission, fulfill part or all of the language requirement. Note that in the case of Dutch, Thai, Tagalog, Vietnamese, and Malay/Indonesian, all or part of the first two years’ work carries upper division credit. In these instances, the first two years’ work will satisfy the language requirement but will not count toward the major unit requirement.

B. The student must select one of the following disciplinary foci and complete at least 12 units of work from the courses listed there (see item 2 under “Additional Major Requirements” above).

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major adviser.

2. Anthropology 184, South Asia (4);

3. One course from among the following: Anthropology 147B, Comparative Gender Systems (4); Anthropology 148, Human Ecological Relationships (4).

Geography

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major adviser.

2. Geography 163, Southeast Asia (4);

3. One course from among the following: Geography 104, The City in the Third World (4); Geography 107, Geography of Religions (4).

History

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major adviser;

2. History 111A, Southeast Asia to the 18th Century (4); History 111B, Modern Southeast Asia (4);

C. Additional units necessary to complete the unit requirement may be selected from among the courses listed under the other disciplinary foci above and from the following:

- Asian Studies 150, Topics in Asian Studies (when on Southeast Asia) (4);
- History of Art 137, Art of Southeast Asia (4);
- Music 133A, Music of the Southeast Asia Tradition (4);
- Music 133B, Music and Theater in Southeast Asia (4);
- Southeast Asian Studies 122, Orality and Literacy in Insular Southeast Asia (3);
- Southeast Asian Studies 123, The Poetry of Indonesia and Malaysia in Translation (3);
- Southeast Asian Studies 124, The Shadow Play in Southeast Asia (3);
- Southeast Asian Studies 128, Introduction to Modern Indonesian and Malaysian Literature in Translation (3);
- South and Southeast Asian Studies 130, Articulations of the Female in Indonesia (4);
- A third year of Dutch, French, or Spanish, with permission, where appropriate.

4. A minimum of one upper division course in Japanese history, which may overlap with the history disciplinary focus.

F. In exceptional cases, individual waivers of specific course requirements for valid academic reasons will be considered with the approval of the major adviser.

Area IV: The Indian Subcontinent

A. The student must complete one additional year of Hindi, Punjabi or Tamil (second-year Hindi, Punjabi, or Tamil) while in the major. Further study of the language after the second year is encouraged and will count toward the major unit requirement as indicated below.

B. The student must select one of the following disciplinary foci and complete at least 12 units of work from the courses listed there (see item 2 under “Additional Major Requirements” above).

Anthropology

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major adviser;

2. Anthropology 184, South Asia (4);

3. One course from among the following: Anthropology 115, Introduction to Medical Anthropology (4); Anthropology 140, Tribal Societies (4); Anthropology 147B, Sexuality/Culture (4); Anthropology 187, Peoples and Cultures of the Himalayas (4).

History

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major adviser;

2. Two courses from among the following: History 100, Race, Gender and the Colonial Experience (4); History 114A, Medieval and Early Modern India to the Coming of the British (4); History 114B, Modern South Asia (4); History 153, British Empire and Commonwealth (4).

Sociology

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major adviser;

2. Two courses from among the following: Political Science 139B, Development Politics; The Public Economy of Development and Underdevelopment (4); Political Science 139C, Selected Issues of Development Politics (4); Political Science 145A-145B, South Asia Politics (4,4).

Political Science

1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major adviser;

2. Two courses from among the following: Political Science 139B, Development Politics; The Public Economy of Development and Underdevelopment (4); Political Science 139C, Selected Issues of Development Politics (4); Political Science 145A-145B, South Asia Politics (4,4).

Minor Program in Asian 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.

There are four minor program options in Asian Studies: Chinese Studies, Japanese Studies, Southeast Asian Studies, and Korean Studies. These programs give students an introduction to the study of one region of Asia through social science and humanities courses. Minimum requirements are five upper division courses with a C or better in each course. At least three of the courses must be completed at Berkeley; only one may overlap with those credited to the student’s major. There is no Asian language requirement for the minor.

Option I. Minor in Chinese Studies: Five upper division courses from among the following:

- Anthropology: 123D, Archaeology of East Asia (170, China)
- Asian Studies: 147, Inside Revolutionary China (148, China Reporting); 149, Media and Society in
Contemporary China; 150, Topics in Asian Studies (when topic is on China)

Buddhism; 181, Development of Buddhism in East and Inner Asia; 182, Buddhism and Contemporary Society


Geography: 166, The Geography of China

History: 116A, Early China; 116B, The Middle Period; 116C, Modern China; 117A, Social History of China

History of Art: 130A, Early Chinese Art, Part I; 130B, Early Chinese Art, Part II; 131A, Early Chinese Painting; 131B, Later Chinese Painting; 131C, Modern Chinese Painting

Legal Studies: 161, Law in Chinese Society

Music: 134A, Music of the East Asia Tradition

Philosophy: 151, Early Chinese Thought; 152, Later Chinese Thought; 153, Chinese Philosophy

Political Science: 128A-128B, Chinese Foreign Policy; 129C, Communist and Post-Communist International Relations; 140B, Comparative Communism; 143A-143B, Northeast Asian Politics; 144A, Rapid Growth in East Asia

Sociology: 183, Contemporary Chinese Society

Option II. Minor in Japanese Studies. Five upper division courses from among the following:

Anthropology: 123D, Archaeology of East Asia

Asian Studies: 150, Topics in Asian Studies (when topic is on Japan)

Buddhism: 181, Development of Buddhism in East and Inner Asia; 182, Buddhism and Contemporary Society

Geography: 168, Japan and Korea

History: 118A, Japanese History, Archaeological Period to 1800; 118B, Japanese History, 1800 to 1900; 118C, Late Nineteenth Century to the Present; 119, Topics in Japanese History


Music: 134A, Music of the East Asia Tradition; 134B, Music of Japan

Political Science: 143A-143B, Northeast Asian Politics; 144A, Rapid Growth in East Asia

Sociology: 183, Contemporary Chinese Society

Option III. Minor in Southeast Asian Studies. Five upper division courses from among the following:

Anthropology: 186, Southeast Asia: Cultures, States, and Capitalism in the Asian Pacific Rim

Asian Studies: 150, Topics in Asian Studies (when topic is on Southeast Asia)

Buddhism: 182, Buddhism and Contemporary Society

Geography: 163, Southeast Asia

History: 111A, Southeast Asia to the 18th Century; 111B, Modern Southeast Asia

History of Art: 137, The Art of Southeast Asia

Music: 133A, Music of the Southeast Asia Tradition

Southeast Asian Studies: 122, Orality and Literacy in Insular Southeast Asia (3); 123, The Poetry of Indonesia and Malaysia in Translation; 124, The Shadow Play in Southeast Asia; 128, Introduction to Modern Indonesian and Malaysian Literature in Translation.

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

G prefix=graduate course

8 prefix=r&c requirement

H1 prefix=course satisfies American cultures requirement

H2 prefix=course satisfies R&C requirement

H3 prefix=honors course

114. China Reporting: Assessing the First Draft of History. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. This course explores the influence of American reporting on the development of U.S.-China relations. Students examine the role journalists have played in shaping public opinion and influencing foreign policy from 1936, the date of Edgar Snow's classic Red Star Over China, to the 1990s. They also compare different accounts of such major historical events as the Great Leap Forward and the Cultural Revolution to consider the importance and the accuracy of commonly accepted stories. Journalists' reports as well as memoirs, television footage, and documentary films provide the texts for this scrutiny of the first draft of China's recent history. (F,SP) Wakeman

148. Sensitive Topics. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. This lecture and discussion course examines the crucial role played by the news media in the establishment, perpetuation, and decline of Communist authority in China. Students analyze the development and the impact of the mass media (newspapers and magazines, radio and television) and of the popular media (revolutionary operas, films, short stories, reportage, wall posters, cartoons, advertisements) from the period of the Communist and the Korean War through the period of the Cultural Revolution to the present. Readings focus on the changing role of the media in society, the relationship between news and propaganda, and the impact of new technology on information. (F,SP) Wakeman

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) Staff

160. Undergraduate Seminar in Asian Studies. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. A reading and research seminar for undergraduate students. Topics will vary by semester. (F,SP)

H191A-H191B. Senior Honors. (33) 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) Staff

196. Senior Thesis. (3) A maximum of 3 units of credit to be applied toward the major. May be repeated without credit toward the 36 unit major requirement. Individual study supervised by appropriate faculty advisor. Prerequisites: Consent of advisor. Open to seniors in the Group in Asian Studies. Individual conferences to be arranged with the major advisor or other appropriate faculty member for collection and analysis of research materials and preparation of the undergraduate thesis. (F,SP) Staff

197. Field 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: Consent of instructor required. Group discussion, research and reporting on selected topics. (F,SP) Staff

Upper Division Courses

147. Inside Revolutionary China: Studies in Memoir, Fiction, and Film. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. In this course students analyze events, policies, and institutions in China from the 1960s through the revealing reports provided in memoirs, profiles, fictional narratives, literary reportage, and feature films. Texts chronicle the personal experience of the revolution from the War of Resistance against Japan (1937-1945) through the post-Mao decade and the suppression of the 1989 democracy movement. (F,SP) Wakeman

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Astronomy

(College of Letters and Science)

Department Office: 601 Campbell Hall, (510) 642-6275
University Professor
Frank H. Shu, Ph.D., Harvard University. Star and planet formation, galaxy dynamics, solar system physics

Professors
Jonathan Arons, Ph.D., Harvard University. High-energy astrophysics, pulsars, binary stars planetary science (Physics)
Donald C. Backer, Ph.D., Cornell University. Neutron stars, galactic center interstellar medium
Gilibert Basri, Ph.D., University of Colorado, Boulder. Star formation and activity, brown dwarfs
Leo Blitz, Ph.D., Columbia University. Star formation, galactic structure and dynamics, radio astronomy
Marc Davis, Ph.D., Princeton University. Physical cosmology, large-scale structure (Physics)
Imke de Pater, Ph.D., University of Leiden. Solar system, radio and infrared astronomy (Earth and Planetary Science)
†Alexei Filippenko, Ph.D., California Institute of Technology. Supernovae, cosmology, black holes, active galaxies
James Graham, Ph.D., Imperial College, London. Interstellar medium, active galaxies, infrared astronomy, radio astronomy
Carr E. Heiles, Ph.D., Princeton University. Interstellar medium, magnetic fields
Raymond J. Jewell, Ph.D., California Institute of Technology. Planetary interiors and origins (Earth and Planetary Science)
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 and intergalactic medium (Physics)
Joseph I. Silk (Emeritus), Ph.D., Harvard University. Cosmology, galaxy formation, star formation
Hyron Spinrad, Ph.D., University of California, Berkeley. Origin and evolution of galaxies, comets
William J. de Poy (Emeritus), Ph.D., University of California, Berkeley. Star formation, interferometry (Electrical Engineering and Computer Science)
C. Stuart Bowyer (Emeritus), Ph.D., Catholic University of America. Ultraviolet astronomy from space
Ivan R. King (Emeritus), Ph.D., Harvard University. Structure of stellar systems, stellar populations
Leonard V. Kuhi, Ph.D. University of California, Berkeley. T Tau Stars, star formation
John P. Phillips (Emeritus), Ph.D., University of Chicago. Molecules in stellar atmospheres
Hans A. Dittmer, Ph.D., Stanford University. Star formation, accretion discs, planetesimal dynamics
Oswald Siegmund, Ph.D., Stanford University. Interstellar matter, accreting X-ray sources, radiation gas dynamics

Adjunct Professors
Albert Glassgold, Ph.D. Massachusetts Institute of Technology. Interstellar medium, astrochemistry
Richard I. Klein, Ph.D. Brandeis University. Star formation, accreting X-ray sources, radiation gas dynamics

Senior Lecturer
David D. Cudaback (Emeritus), Ph.D. Molecular astronomy

Graduate Courses

C200. The Pacific Rim. (4) Three hours of seminar per week. Prerequisites: Consent of instructor. The purpose of this course is to provide a reasonably comprehensive overview of what has become known as the “Pacific Rim.” The course will focus on economic growth, regional security, and democratization. Also listed as Political Science C240. (SP) Dittrich

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 Asian interests, research methods, and the courses they teach. It consists of presentations by faculty on their past, present, and future research. (F,SP) Staff

298. Directed Group Study. (2-6) Group meetings to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Group study of selected topics that vary from term to term. (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

The Major in Astrophysics

During the first two undergraduate years, students must, in addition to fulfilling certain specific requirements of the College and Letters and Science, pursue studies that will prepare them for future work in astronomy or in other careers that benefit from an education in a physical science, such as science teaching, or research in a physical science field. Specifically, the department requires that during the first two years, and in any case before declaring the major, students take courses that provide a thorough understanding of the following:

(1) Basic principles of physics: mechanics, properties of matter, electricity and magnetism, heat, wave motion, sound and light (Physics 7A, 7B, 7C);
(2) Basic mathematics: analytic geometry, differential and integral calculus, differential equations, and linear algebra (Math 1A-1B, followed by Math 53 and 54); and

(3) An introduction to astrophysics (Astronomy 7A-7B).

In addition, students are urged to take any of the foreign language courses that will enable them to gain a speaking knowledge of German, Russian, French, or Japanese.

The last two years, leading to the A.B. degree in astrophysics, are spent in more intensive work, primarily in the fields of astronomy, physics, and mathematics. The specific plan of study to be followed by each student is to be worked out in consultation with the departmental advisers for the major, and must include 30 units of upper division work in astronomy and allied fields. For students who are double majors in astronomy and another science, the upper division requirement is reduced to 24 units.

The major has been organized around two basic structures. All students are required to take at least one semester of undergraduate laboratory (Astronomy 120, 121, or 122). Focused structure, oriented toward students who are considering pursuing graduate study in astrophysics, has a strong emphasis on physics (particularly in electromagnetism and statistical physics). These students are required to take the senior-level course Astronomy C160A-C160B (cross-listed as Physics C160A-C160B) and one of the laboratory courses (Astronomy 120, 121, or 122). Many such students pursue a double major in astrophysics and physics. Astronomy 149 is also recommended, although it is not required. With the approval of a graduate adviser, outstanding students may take a graduate course in astronomy.

Broad structure has been designed for students who have chosen not to go to graduate school in astronomy. Such students include those who want to study astronomy simply for its intellectual and cultural interest, and those who want to use the major as a platform for later work or study in fields where a strong technical background in the quantitative understanding of complex physical systems is desirable. Students take Astronomy 149, 169, and one of the laboratory courses (Astronomy 120, 121, and 122).

Honors Program. For honors in astrophysics a student must fulfill the following additional requirements: (1) maintain a grade-point average of at least 3.5 in all courses in astronomy and related fields, and an overall grade-point average of at least 3.3 in the University; (2) carry out an individual research or study project, involving at least three units of H195. The student’s project is chosen in consultation with a departmental adviser, and the written report is judged by the student’s research supervisor and by a departmental adviser.

For more detailed or complete information about the astrophysics major, an undergraduate handbook is available through the undergraduate assistant in the department.

The Minor in Astrophysics

The minor program consists of two of (120, 121, or 122), 149, 160A, 160B, 169; and three upper division courses. Electives Courses 7A and 7B are recommended for the minor but not required.

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 is essential, however. In order to facilitate communicating with non-English-speaking scientists, entering students are urged to study at least one language of German, Russian, French, or Japanese as undergraduates.

In addition to the qualifying examination required by the University, the department requires students to pass a preliminary examination which tests 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 which are useful for the development of radio, infrared, and X-ray instruments, and for the precise measurement of images and spectra.
courses (12 of them in graduate courses) and the preliminary examination.

Lower Division Courses

3. Descriptive Cosmology. (2) Two hours of lecture per week. Prerequisites: 7A or consent of instructor. Non-mathematical description of research and results in modern extragalactic astronomy and cosmology. Staff

4. The Solar System and Beyond. (2) Two hours of lecture per week. Prerequisites: 10 or consent of instructor. Discussion of the history and evolution of the solar system, including results from recent space-probe exploration. Some facility in high school mathematics expected. Staff

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 and one hour 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 fundamental concepts in 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 an introduction to the formation of the solar system. The study of stars will treat determination of observables, properties and stellar structure, and evolution. The physics in this course includes mechanical and gravitational; kinetic theory of gases; properties of radiation and radiative energy transport; quantum mechanics of photons, atoms, and electrons; and magnetic fields. (F) Marcy

7B. Introduction to Astrophysics. (4) Students will receive 2 units of credit for 7B after taking 10; 6 units of credit for both 7A-7B after taking 10. Three hours of lecture and one hour of laboratory per week. Prerequisites: Physics 7A-7B (7B can be concurrent) or consent of the instructor. This is the second part of an overview of fundamental concepts in the way in which physics is applied to astronomy. This course covers the Milky Way galaxy, star formation and the interstellar medium, galaxies, black holes, quasars, dark matter, the expansion of the universe and its large-scale structure, and cosmology and the Big Bang. The physics in this course includes that used in 7A (mechanics and gravitation; kinetic theory of gases; properties of radiation and radiative energy transport; quantum mechanics of photons, atoms, and electrons; and magnetic fields) and adds the special and general theories of relativity. (SP) Marcy

9. Selected Topics in Astronomy. (2.3) Course may be repeated for credit. Two to three hours of lecture per week. Prerequisites: 7A-B, 10, or consent of instructor. By graduate student. This course will explore one of a variety of subjects in greater depth than in introductory courses. Possible topics include stars, galaxies, the solar system, the interstellar medium, relativity and cosmology, history of astronomy, observational astronomy, and life in the universe. (F,SP) Staff

10. Introduction to General Astronomy. (4) Students will receive no credit for 10 after taking 7A or 7B. 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 extra-solar planets, etc. Individual instructor's synopses available from the department. (F,SP) Filippenko, Davis (F), Basri (SP)

C12. The Planets. (3) Three hours of lecture per week. A tour of the planets and moons of the solar system, and an introduction to their internal structures, atmosphere, and space features. Processes that form planets and act continually to change them (e.g., earthquakes, volcanoes, giant impacts) are discussed; as are comets, asteroids, rings, and life. Information gained from recent spacecraft missions is highlighted. Intended for non-science majors. Also listed as Earth and Planetary Science C12.

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/no pass basis. Section 2 to be graded on a letter-grade basis. The Berkeley 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. Seminars are offered in all departmental campuses, and topics vary from department to department and semester to semester.

39. Seminar. (1.5) Two 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. A small-sized seminar using one intentional and one non-intentional topic in depth. Students are responsible for much of the presentation. (SP) Basri, Filippenko, Davis

99. Directed Study in Astronomy. (1-3) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: 7A, 10 and consent of instructor. Supervised observational studies or directed reading for lower division students. (F,SP) Staff

Upper Division Courses

100. Communicating Astronomy. (1-2) Course may be repeated for credit. Six hours of laboratory 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 students. The course combines lectures in science education and teaching methodology and pedagogy with six weeks of supervised teaching in local K-12 schools. The students will provide a probe of the extrema of physics. Also listed as Physics 112 (may be taken concurrently) and either Physics 110A-110B or Physics 137A-137B. Observational constraints on the properties and evolution of stars. Theory of stellar structure. Stellar atmospheres and stellar spectroscopy. Evolution of high and low mass stars; supernovae. Degeneracy of matter and structure of collapsed stars. Elements of gas dynamics, accretion onto compact objects. Dynamics and evolution of close binary systems, either stellar pulsation or formation. Also listed as Physics C160A. (F) Filippenko

C160B. Relativistic Astrophysics and Cosmology. (4) Four hours of lecture and one hour of discussion per week. Prerequisites: Senior standing in astronomy or physics or consent of instructor. Physics 112 (may be taken concurrently) and either Physics 110A-110B or Physics 137A-137B. A prior knowledge of astrophysics comparable to that found in Astronomy 7A-7B is useful but not required. Elements of general relativity, Physics of pulsars, cosmic rays, black holes. The cosmological distance scale, elementary cosmological models, properties of galaxies and quasars. The mass density and age of the universe. Evidence for dark matter and concepts of the early universe and of galaxy formation. Reflections on astrophysics as a probe of the extreme of physics. Also listed as Physics C160B. (SP) Holzapfel

169. The Origin of Galaxies and the Universe. (3) Three hours of lecture per week. Prerequisites: 7A-7B recommended but not required; Mathematics 53, 54, Physics 7A-7B-7C. Formerly 127C. This course covers the largest topics in astronomy: the study of galaxies and the universe as a whole. It includes the modern story of creation, beginning with the expansion of our Universe, its early hot-dense phase when the light elements were formed. A discussion of how and why galaxies and active galaxies including their formation and evolution. Quasars and their utility in illuminating the gas in the Universe at high redshift. The discovery of Dark Matter by its effect on the motions of galaxies and its gravitational lensing effect and its role in the formation of large-scale structure. (SP) Spinrad

H195. Special Study for Honors Candidates. (2-4) Individual project of research or study. (F,SP) Staff

199. Supervised Independent Study and Research. (2-4) Course may be repeated for credit. Independent study. Must be taken on a passed/not passed basis. Prerequisites: 127A-127B. Enrollments are regulated in the General Catalog. (F,SP) Staff

 prefix=course language=course for business majors
 prefix=course cross-listed course
 prefix=honor course
 R prefix=course satisfies R&F requirement
 AG suffix=course satisfies American cultures requirement
201. 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 201A. An introduction to the basic physical processes affecting 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. (F) Arons, Backer, Shu, Welch


203. Astrophysical Techniques. (3) Three hours of lecture per week and frequent laboratory work plus observations visits. Prerequisites: 201 and 290A, 290B must be taken concurrently. Introduction to the use of astronomical signals through telescope optics and into detectors; subsequent calibration, deconvolution of instrumental artifacts, and analysis. A broad wavelength approach is maintained with focus on shared fundamental concepts. Students "adopt a wavelength band" for assignments and presentations. Analysis and simulation of astronomical signals, noise, and errors. (SP) Backer, Basri, Blitz, Graham, Marcy, Welch

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, Graham, Shu, Welch

217. Stellar Atmospheres. (3) Three hours of lecture per week. Prerequisites: 201. Spectral characteristics of normal and peculiar stars. Interpretation via model atmosphere, line profiles, curve of growth, etc. Line and continuous opacity, line-blanketing, convection, non-LTE, extended atmospheres. Current problem areas. Basri, Marcy, Shu

218. Stellar Dynamics and Galactic Structure. (3) Three hours of lecture per week. Prerequisites: 201. A basic course. Structure and kinematics of the galaxy; stellar population concepts; dynamics of stellar systems with and without encounters. (F) Blitz, Davis, Graham, Spinrad

225. Extragalactic Astronomy and Cosmology. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 201. An introduction to the basic concepts of extragalactic astronomy. Classification and morphology of galaxies, the distance scale, galaxy dynamics and masses, the stellar population of galaxies, clusters of galaxies, galaxy evolution, and active galactic nuclei (including QSOs). Cosmological models and the early universe. (SP) Davis, Filipenko

249. Solar System Astrophysics. (3) Three hours of lecture per week. Prerequisites: 127 series or consent of instructor. The physical foundations of solar system astronomy. Planetary atmospheres and surfaces. Meteors, comets, and the interplanetary medium. Observational techniques and problems. (F) de Pater, Jeanloz, Marcy

249. Solar System Astrophysics. (3) Three hours of lecture per week. Prerequisites: 149, 169, C169A or consent of instructor. The physical foundations of solar system astronomy. Topics include the solar nebula and modern observations of disks, the formation of the planets, planetary interiors and surfaces, planetary atmospheres, meteoroids, and smaller bodies in the solar system. The physical processes at work are developed in some detail, and an evolutionary picture for each class of objects is expounded. Some discussion of other (potentially planetary) systems is also included. Also listed as Earth and Planetary Science C249.

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: 137A-137B, 112, 110A-110B. Equations of stellar structure, radiative transfer and convection, thermonuclear reactions and stellar energy generation; stellar models, degenerate configurations, evolutionary sequences, supernovae, neutron stars, black holes, nucleosynthesis. (F,SP) Arons, Filipenko, Marcy, Shu

254. High Energy Astrophysics. (3) Three hours of lecture per week. Prerequisites: 201 or consent of instructor. Basic physics of high energy radiation processes in 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) Arons, Boggs, Lin

255. Computational Methods in Theoretical Astrophysics. (3) Three hours of lecture per week. Prerequisites: 201, 202, or consent of instructor. A broad survey of state-of-the-art approaches to astrophysical self-gravitational gas dynamics with application to large scale simulation of coupled non-linear astrophysical flows. Finite-difference approaches for Lagrangian and Eulerian astrophysical hydrodynamics and coupled radiation-hydrodynamics. N-body gravitation techniques including direct N-body, P-M, F3M and hierarchical Tree. Particle gas dynamics methods such as Smooth Particle Hydrodynamics (SPH), Adaptive SPH and unification of SPH and Tree hierarchies (TREE-SPH). Advanced techniques such as higher order finite difference hydrodynamics with Adaptive Mesh Refinement (AMR). Application of these approaches in three broad areas: Cosmology: High Energy Astrophysics and the Interstellar Medium. (SP) Klein

285. Theoretical Astrophysics Seminar. (2) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. The study of theoretical astrophysics. Also listed as Physics C285. (F,SP)

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) Arons

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) Arons

292. Seminar. (1-2) 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 in any one section. (F,SP) Staff

296. 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. degree. Study of the doctoral degree. May not be used for unit or residence requirement for the doctoral degree. (F,SP) Staff

Professional Courses

300. Instruction 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; three 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: 459 Evans Hall, (510) 642-8285
http://www.bioeng.berkeley.edu
Chair: Thomas F. Budinger, M.D., Ph.D.

University Professor
Richard M. Karp (Chair of 39 Professor Emeritus), Ph.D. Harvard University. Analysis of algorithms

Professors
Stanley A. Berger, Ph.D. Brown University. Fluid mechanics Thomas F. Budinger (Chair of the Department), M.D., Ph.D. University of California, Berkeley. Biomedical imaging James Caseley (Associate Dean, Interdisciplinary Studies), Ph.D. University of California, Berkeley. Continuum mechanics
Theodore E. Cohn, Ph.D. University of Michigan. Vision science
Boris Reznikov, Ph.D. Massachusetts Institute of Technology. Heat, mass transfer, cryopreservation
S. Shankar Sastry, Ph.D. University of California, Berkeley. Robotics, control systems

Associate Professors
Kevin E. Healy, Ph.D. University of Pennsylvania. Biomechanics and tissue engineering
Tony M. Keaveny, Ph.D. Cornell University. Tissue engineering and biomechanics
Dorian Liepmann, Ph.D. University of California, San Diego. Fluid dynamics, Bio-MEMS
Lisa A. Pruitt, Ph.D. Brown University. Tissue biomechanics, biomaterial science

Assistant Professors
Adam Arkin, Ph.D. Massachusetts Institute of Technology. Computational biology
Teresa Head-Gordon, Ph.D. Carnegie-Mellon University. Theoretical chemistry
Luke Lee, Ph.D. University of California, Berkeley. Biomicroelectromechanical systems (Bio-MEMS), biomimetic devices
Song Li, Ph.D. University of California, San Diego. Bioengineering

Professor
Rajendra S. Bhatnagar, Ph.D. (University of California, San Francisco)

Associate Professors
Sarah J. Nelson, Dr. rer. Nat. (in residence), (University of California, San Francisco.)
David Rempel, Ph.D. (University of California, San Francisco.)

Assistant Professors
Steven E. Brenner, Ph.D.
Frank Tenfor, Ph.D. (in residence), (University of California, San Francisco.)

We believe that in the years ahead, biology and modern engineering will be seamlessly integrated to improve health and human productivity through major advances in medicine. We anticipate future breakthroughs ranging from the design of drugs customized to an individual’s genome to the perfection of artificial implantable organs. Aggressive and intelligent integration of engineering and the biological and medical sciences can hasten the realization of these and other innovations, leading to longer, healthier, and more productive lives.
We can now visualize structures inside the body with a level of clarity thought impossible only a decade ago. With the improved diagnosis that comes from these advances and those that will follow, we will add further discoveries in the area of treatment. Today, miniature devices can be manipulated through endoscopes, making it possible to perform such procedures with minimal inva-
sion and thus minimal trauma to the patient. In the future, we expect that the microfabrication of devices pioneered in engineering at Berkeley will further enable surgery and increase the function-
ality of the physically impaired in applications ranging from prosthetics to improving the func-
tion of major organs, such as the heart, kidneys, and liver. Other areas show similar promise: break-
throughs in human tissue research may enable us to replace damaged or diseased bone, cartilage, and other tissues with newly engineered materials. There is little doubt that these and other extraor-
dinary developments will occur over the next few decades. By merging the leadership and talents found in the College of Engineering, with the Biologi-
cal and biomedical sciences at the University of Cal-
ifornia, Berkeley, the biological and health sciences at the University of California, San Francisco (UCSF), and the assets at the Lawrence Berkeley National Laboratory (LBNL), the Department of Bio-
ingineering will be uniquely positioned to become a leader in this arena.

We believe that Berkeley and UCSF can lead the nation in advancing this new mode of medicine by educating a new type of engineer: a world-class bioengineer. In this spirit, we are dramatically in-
creasing our student enrolments, investing in new faculty, staff, and facilities, expanding our research program, and integrating the broad range of bio-
ingineering activities currently under way on our campuses. We foresee that, through the formal or-
ganizational integration of our two institutions, we will form a new entity—a joint University of Cal-
ifornia department—that can achieve far greater re-
sults than either campus could working alone.

The two-campus Department of Bioengineering is being created in phases. In Phase I, a Department of Bioengineering has been formed within Berke-
ley's College of Engineering, and a Department of Bio-
ingineering is being formed within the School of Medicine at UCSF. Phase II will see the formal es-
alishment of the joint intercampus structure.

Undergraduate Program

The Department of Bioengineering at UC Berkeley, established in 1998, unites faculty and students, as well as academic and research programs at the University of California, Berkeley and the University of California, San Francisco. The multidisciplinary undergraduate major is intended for academically strong students who excel in the physical sciences, mathematics, and biology. It offers students an op-
portunity to apply the physical sci-
dences and mathematics in an engineering ap-
proach to biological systems. The undergraduate curriculum is designed to ensure that students will be well grounded in the fundamental principles of cell biology and molecular biology. There are further opportu-
nities for specialization in advanced areas of both engineering and biology, including laboratory and clinical components on the two campuses.

Students can tailor their upper division programs to prepare specifically for graduate school; medical, dental or optometry school; or immediate em-
ployment upon graduation. We currently offer dental or optometry school; or immediate em-
plication preparation for graduate school; medical, Students can tailor their upper division programs to
engineering and biology, including laboratory and course credit for graduate school.

Curriculum and Degree Requirements

A minimum of 122 semester units is required for the bachelor’s degree in bioengineering, including:

- Approximately 64 units in the lower division (de-
scribed below) designed to provide a strong foun-
dation in the physical and biological sciences and mathematics, as well as an introduction to the var-
ious fields of engineering normally applied to biol-
y and medicine.
- Upper division study that combines advanced courses in engineering, physical and biological sci-
ces, and/or mathematics and statistics. Some courses have clinical content.
- At least 40 units of approved technical courses (mathematics, statistics, science, engineering), of which at least 16 units are upper division engi-
evering, mathematics, or physical sciences courses.
- Six courses of at least 3 units each in humanities and social studies, all selected from the college’s lists of approved courses:
  1. At least one of these must be a Reading and Composition course from the current approved college-
list (List E). The course in Reading and Composition must be taken at Berkeley, not at other schools, once the student starts at Berkeley.
  2. One course must be selected from the list of approved courses. The course must be chosen from the list of selected courses in litera-
ture and values.
  3. One course must have a substantial ethics con-
tent and be chosen from the approved ethics list.
  4. Two of these must be upper division courses.
  5. The Reading and Composition course and either the course in history or cultures or that in litera-
ture and values must be taken for a letter grade.
  6. A minimum of two courses, at least one of which is upper division, must be taken from a single de-
partment.

Lower Division

Upper Division

Eight bioengineering core courses; MCB 100 or 102; math/science elective; engineering elective; Bioengineering 153; biology elective; engineering design elective; and two-four courses in humanities or social studies from the college.

Graduate Study

Graduate Group Executive Committee: Thomas F. Budinger, M.D. Ph.D., Theodore E. Cohn, Ph.D. (Chair), C. Anthony Hunt, Ph.D., Sharmila Majumdar, Ph.D., Lynn Verhey, M.D.

The graduate degree (Ph.D.) in bioengineering is administed by the Joint UCSF/UCB Bioengi-
neering Graduate Group, which operates in co-
operation with the Department of Bioengineering. This program permits students to benefit from both the strong clinical and health sciences resources available on the San Francisco campus and the strong engineering and basic life sciences re-
sources available on the Berkeley campus.

The program is interdepartmental as well as in-
tercampus. It combines related interests and re-
sources from faculty of five of the seven engineering departments and from several non-engine-
ingineering departments at Berkeley with those of the faculty from all four professional schools (Dentistry, Medicine, Nursing, and Pharmacy) at San Fran-
sisco.

All students in the program are simultaneously en-
rolled in the Graduate Divisions of both the San Francisco and Berkeley campuses and are free to take advantage of courses and research opportu-
nities 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 admis-
sion. Students can obtain additional information and application materials for the Bio-
engineering Graduate Program, College of Engi-
neering, 464 Evans Hall, University of California, Berkeley; Berkeley, CA 94720-1762; (510) 642-
5860.

Lower Division Courses

24. Aspects of Bioengineering. (1) Course may be repeated for credit. One hour of seminar per week. Must be taken on a pass/fail/pass basis. The two-campus seminar is designed to be taken and to provide a glimpse of the breadth of bio-
ingineering research that is currently underway at Berkeley and UCSF. The goal is to help students gain a feeling for the breadth of interesting problems in bio-
ingineering and also the variety of ways that engi-
eering principles can be applied to biological and medical problems. A series of one-hour seminars will be presented by researchers, professors, and other students.

Upper Division Courses

100. Ethics in Science and Engineering. (2) One and one-half hours of lecture per week. The goal of this course is to present the historical con-
duct in the practice of engineering, in the conduct of re-
search, in publication, in private and public disclosures, and in managing professional and financial conflicts. The method is through historical didactic presentations, case studies, presentations of technical methods for problem solving in ethical matters, and classroom de-
bates on contemporary ethical issues. Faculty from re-
ligious studies, journalism, and law from the UC Berke-
ley campus will give guest lectures. (SP) Budinger

115. Cell Biology Laboratory for Engineers. (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: Molecular and Cell Biology 110 or 113. The structural and functional characteristics of musculoskeletal tissues (and tendon and bone, cartilage) are altered by cells in response to loading, injury, nu-
trition, and other factors. A contemporary under-
standing of the structural form, function and longevity includes knowledge of tissue ultrastructure, compo-
sition of matrix, and cell function. Students will be in-
troduced to cellular and molecular biology and bio-
chemistry techniques as applied to musculoskeletal tissues including histology, image analysis, protein quantification, gene analysis and expression, and cell culture. By applying these techniques to structural tis-
es in the laboratory, students can learn the reliabil-
ity and limitations of these tools. (Spring) D. Krempl

C117. Structural Aspects of Biomaterials. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A, Engineering 45, and Civil Engineering 130. This course covers the mechanical and structural aspects of biological materials including the re-
placement. Tissue structure and mechanical function are addressed. Natural and synthetic load-bearing bio-
materials for clinical and medical applications are re-
viewed. Biocompatibility of biomaterials, and the host re-
response to structural implants are examined. Quantitative treatment of biomechanical issues and constitutive relationships of tissues and biomaterials are considered. Material testing is provided for biomaterials applications including reconstructive surgery, orthopedic, dentistry, and cardiology. Mechanical design for

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

prefix=language course for business majors
prefix=xprefix=x-cross-listed course
prefix=prefix=honors course
R prefix=course satisfies R&C requirement
AC suffix=course satisfies American cultures requirement
B prefix=language course for business majors
C prefix=x-x-cross-listed course
H prefix=prefix=honors course

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C118. Biological Performance of Materials. (3)
Three hours of lecture per week. Prerequisites: Engineering 45 and Biology 1A-1B (may be taken concurrently). Introduction to the problems associated with the selection and function of biomedical materials. Structural properties of biomaterials and their interaction with biological systems will be addressed. Applications of the concepts developed include blood-materials compatibility, biomimetic materials, and hard and soft tissue-material interactions, drug delivery, tissue engineering and biotechnology. Also listed as Materials Science and Engineering C118. (F,SP) Healy

121. 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. Concepts of scale and fabrication of biomaterials and their interaction with biological systems will be addressed. Applications of the concepts developed include blood-materials compatibility, biomimetic materials, microfluidics, and three-dimensional tissue engineering and biotechnology. Also listed as Materials Science and Engineering C118. (F,SP) Healy

C125. Introduction to Robotics. (4)
Three hours of lecture and one hour of discussion per week. Prerequisites: Electrical Engineering 120 or equivalent, and consent of instructor. An introduction to the kinematics, dynamics, control, sensing, and programming of robots. The course will cover forward, inverse kinematics of serial chain manipulators. The manipulator Jacobian, force relations, and control-position, and force control. Trajectory generation, collision avoidance, automatic planning of fine and gross motion strategies; robot programming languages. Proximity, tactile, and force sensing, stability, and fidelity in teleoperation. Biological analogies and medical applications of robotics. Also listed as Electrical Engineering C125. (F,SP) Sastry, Tendick

C153. Principles of Bioengineering. (4)
Three hours of lecture and one hour of discussion per week. Prerequisites: Chemical Engineering 117 or equivalent, and consent of instructor. 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 cover degradation schemes of polymers and long-term performance issues. The class will include polymer applications in both engineering and medicine. Also listed as Mechanical Engineering C223. (F) Pruitt

290. Advanced Topics in Bioengineering. (1-3)
Course may be repeated for credit. One hour of lecture per week. Prerequisites: Consent of instructor. This course will cover 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)

290C. Advanced Topics in Micromachines and Robotics. (1-3) (F,SP)

290D. Advanced Topics in Computational Biomechanics. (1-3) (F,SP)

290E. Advanced Topics in Neural and Sensory Systems Bioengineering. (1-3) (F,SP)

290F. Advanced Topics in Biomedical Imaging and Signal Processing. (1-3) (F,SP)

290G. Advanced Topics in Radiological Biomechanics. (1-3) (F,SP)

290H. Advanced Topics in Biomedical Systems Engineering. (1-3) (F,SP)

290I. Advanced Topics in Special Topics in Bioengineering. (1-3) (F,SP)

299. Individual Study or Research. (1-12)
Course may be repeated for credit. Must be taken on a pass/no pass basis. Supervised independent study. (F,SP) Staff

Graduate Courses

213. Fluid Mechanics of Biological Systems. (3)
Three hours of lecture per week. Prerequisites: Mechanical Engineering 106. Formerly Mechanical Engineering 213. Investigation of fluid mechanical aspects of various physiological systems including circulatory, pulmonary, and renal systems. Motion in the large and small blood vessels. Pulsatile and peristaltic flow. Analysis of prosthetic devices. Fluid flow related to biological systems in bioprocessing application. Instrumentation for fluid flow measurements in biological systems. (F,SP) Berger, Liepmann

C223. Polymer Engineering. (3)
Three hours of lecture and one hour of discussion per week. Prerequisites: Civil Engineering 130, 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 both engineering and medicine. Also listed as Mechanical Engineering C223. (F) Pruitt

211. Principles of Biomechanics. (4)
Three hours of lecture and one hour of discussion per week. Prerequisites: Physics 81A and 81B, or consent of instructor. General introduction to cell structure and function, cellular and molecular processes, and the programming of robots. The course will cover forward, inverse kinematics of serial chain manipulators. The manipulator Jacobian, force relations, and control-position, and force control. Trajectory generation, collision avoidance, automatic planning of fine and gross motion strategies; robot programming languages. Proximity, tactile, and force sensing, stability, and fidelity in teleoperation. Biological analogies and medical applications of robotics. Also listed as Electrical Engineering C125. (F,SP) Sastry, Tendick

C153. Principles of Bioengineering. (4)
Three hours of lecture and one hour of discussion per week. Prerequisites: Electrical Engineering 120 or equivalent, and consent of instructor. 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 cover degradation schemes of polymers and long-term performance issues. The class will include polymer applications in both engineering and medicine. Also listed as Mechanical Engineering C223. (F) Pruitt

290. Advanced Topics in Bioengineering. (1-3)
Course may be repeated for credit. One hour of lecture per week. Prerequisites: Consent of instructor. This course will cover 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)

290C. Advanced Topics in Micromachines and Robotics. (1-3) (F,SP)

290D. Advanced Topics in Computational Biomechanics. (1-3) (F,SP)

290E. Advanced Topics in Neural and Sensory Systems Bioengineering. (1-3) (F,SP)

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Graduate Courses

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290. Advanced Topics in Bioengineering. (1-3)
Course may be repeated for credit. One hour of lecture per week. Prerequisites: Consent of instructor. This course will cover 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)

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290H. Advanced Topics in Biomedical Systems Engineering. (1-3) (F,SP)

290I. Advanced Topics in Special Topics in Bioengineering. (1-3) (F,SP)

299. Individual Study or Research. (1-12)
Course may be repeated for credit. Must be taken on a pass/no pass basis. Supervised independent study. (F,SP) Staff
are listed in this catalog among the offerings of the Department of Molecular and Cell Biology and the Department of Chemistry, among other possibilities. Further information is available from the group office.

Biostatistics
(College of Letters and Science and School of Public Health)

Group Major in Biostatistics
The Group in Biostatistics offers two graduate programs: M.A. and Ph.D. These programs are appropriate for students who have either a strong mathematical and statistical background with a focus in the biomedical sciences, or degrees in the appropriate for students who have either a strong background in mathematics, statistics, and the subject matter areas will have opportunity to fulfill some of these prerequisites during the first year of graduate study.

Research Facilities
Graduate students in the group have direct access to a variety of specialized computer facilities as well as the services of the campus computing facilities. Research activity of the faculty currently includes biostatistical computing, statistical issues in AIDS research, clinical trials, environmental health and epidermiology, Projects in research areas provide opportunities for both practical experience and individual research. Cooperation with other departments allows unusually broad and effective training in both theoretical and applied directions.

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. Such flexibility allows students in consultation with the graduate adviser to arrange an individualized program. See Public Health and Statistics for course listings.

Buddhist Studies
(College of Letters and Science)

Group Office: 7223 Dwisnelle Hall, (510) 642-4219
Chair: Padmabhan S. Jain, Ph.D.

Professors
†Robert P. Goldman, Ph.D. University of Pennsylvania. (South and Southeast Asian Studies)
†Padmabhan S. Jain, Ph.D. University of London. (South and Southeast Asian Studies)
Eleanor Rosch, Ph.D. University of California, Berkeley. (Psychology)
Kwang-Loi Shun, Ph.D. Stanford University. (Philosophy)
Joanna Williams, Ph.D. Harvard University. (Art)
Lewis R. Lancaster (Emeritus), Ph.D. University of Wisconsin. (East Asian Languages and Cultures)

Graduate Advisers: Mr. Brillinger, Mr. Chen, Mr. Jewell, Mr. Selvin, Mr. Tarter, Mr. van der Laan.

Group Major in Biostatistics

Many issues in the health, medical, and biological sciences are addressed by collecting and exploiting relevant data. The development and application of techniques to better understand such data is the fundamental concern of the Group in Biostatistics. The program offers training in theory of statistics and biostatistics, the computer implementation of analytic methods, and opportunities to use this knowledge in the context of biological research. The curriculum is taught primarily by members of the Department of Statistics (College of Letters and Science) and the Division of Biostatistics (School of Public Health) and provides a wide range of ideas and approaches to the analysis of data.

Graduate Programs and Degrees
The Group in Biostatistics offers two graduate programs: M.A. and Ph.D. These programs are appropriate for students who have either a strong background in mathematics, statistics, and the subject matter areas will have opportunity to fulfill some of these prerequisites during the first year of graduate study.

Preparation for Graduate Study
Minimum entrance requirements consist of two full-year courses in calculus and a one-year course in statistics or biostatistics. Entering students who are not adequately prepared in mathematics, statistics, and the subject matter areas will have opportunity to fulfill some of these prerequisites during the first year of graduate study.

Business Administration
(Walter A. Haas School of Business)

Office: SSAS Student Services Building #1900
Dean: Laura D’Andrea Tyson (BankAmerica Dean), Ph.D.
Associate Deans:
Benjamin E. Herermalin, Ph.D. (Academic Affairs)
Andrew W. Shogan, Ph.D. (Instruction)
Jay S. Stowsky, Ph.D. (School Affairs and Initiatives)

Directors:
David C. Mowery, Ph.D. (PhD Program)
Diane Dimetti, M.B.A. (Evening M.B.A Program)
David H. Dei, M.B.A. (Executive M.B.A Program)
Dan Hinémeister, M.Sc. (Undergraduate Program)

Professors
Severn Borenstein (Ewold T. Grether Chair in Business Administration and Public Policy), Ph.D. Massachusetts Institute of Technology. Industrial organization and government regulation, law and economics, and macroeconomics.
Robert E. Cole (Lorne and Joan Mitchell Chair in Leadership and Communication II), Ph.D. University of Illinois. Work organization, industrial relations, organizational change, Japan.
Robert H. Edelstein (Chair in Real Estate Development), Ph.D. Harvard University. Real estate finance and institutions.
John H. Freeman (Leo B. and Florence Helzel Chair in Entrepreneurship and Innovation), Ph.D. University of North Carolina. Organizational theory and entrepreneurship.
Paul G. Hirtle, Ph.D. University of Wisconsin. Economic development, industrial organization, health economics.
Rashi G. Hilsenrath, Ph.D. Stanford University. Marketing strategies and decision making.
Nils H. Hakanson (Sven-Olaf Nilsson Professor of Finance and Accounting), Ph.D. C.P.A. University of California at Los Angeles. Investment theory, financial markets, accounting.
Benjamin E. Herermalin (Wills III Chair in Banking and Finance), Ph.D. Massachusetts Institute of Technology. Theory of contracts, mechanism design, and international trade.
Don S. Hochoody, Ph.D. University of Pennsylvania. Operations research, computer systems, algorithms.
Dwight M. Jaffe (Wills III Chair in Banking and Finance), Ph.D. Massachusetts Institute of Technology. Housing finance, mortgage lending, financial futures and options, thrift industry.
Haynie E. Leland (Arno A. Rayner Chair in Finance and Management), Ph.D. Harvard University. Portfolio strategies and organizational decision making.
Richard Lyons, Ph.D. Massachusetts Institute of Technology. International financial management, international economics.
Thomas A. Marshak, Ph.D. Stanford University. Economics mechanisms design, theoretical computer science, and international trade.
David C. Mowery (Wills T. Herrill Chair in Business), Ph.D. Stanford University. Economics and policy of technological change, business history.
Tord K. Petersen, Ph.D. University of Wisconsin. Career systems, labor, and human resource management.
John M. Quigley, Ph.D. Harvard University. Microeconomics, public finance.
Karlene A. Roberts, Ph.D. University of California, Berkeley. Organizational communication, high-reliability systems.
Andrew K. Rose (Bernstein Chair in International Trade), Ph.D. Massachusetts Institute of Technology. International finance, macroeconomic policy.
Kenneth T. Rosen (Califonia Real Estate Chair), Ph.D. Massachusetts Institute of Technology. Real estate, housing, mortgaging.
Mark E. Rieck (Paul H. Stephens Chair in Applied Investment Analysis), Ph.D. University of California at Los Angeles. Options and portfolio insurance.
Ate Segiev, Ph.D. University of Rochester. Database design, distributed processing, MIS.
Gupta Shankar, Ph.D. University of Toronto. Operations research, stochastic modeling.
Carl Shapiro (Transamerica Chair in Business Strategy), Ph.D. Massachusetts Institute of Technology. Competitive strategy, innovation and intellectual property, antitrust and regulation.
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Pablo T. Spiller, (Joe Shoong Chair in International Business), Ph.D. University of Chicago. Political economy, industrial organization, and public policy, regulation in developing countries

Barry M. Stigler (John Mitchell Chair in Leadership and Communication), Ph.D. Northwestern University. Decision making, behavior, leadership

David J. Teece (Mitsubishi Bank Chair in International Business and Finance), Ph.D. University of Pennsylvania. Strategic management, industry evolution, innovation, internationalization

Brett M. Trueman (Donald H. and Ruth F. Seasholes Chair in Marketing and Public Policy), Ph.D. University of California, Berkeley. Information management systems

David Vogel (Graduate Chair of Business Ethics), Ph.D. Princeton University. Business-government relations, social responsibility, ethics, and global business

James A. Wilcox (Kruttschnitt Family Chair in Financial Institutions), Ph.D. University of California, Berkeley. Finance, interest rates, forecasting

Oliver E. Williamson (Edgar F. Kaiser Chair in Business Administration), Ph.D. Carnegie-Mellon University. Economics of organizations, property rights, business strategy

Russell L. Ackoff (Emeritus) (M. H. Franco Wong, Ph.D. University of Pennsylvania. Management, business ethics, behavior

K. Roland A. Artle (Emeritus) (Howard A. Shelanski, Ph.D. University of Pennsylvania. Management, strategy, behavior, and decision making

Richard H. Holton (Emeritus) (Vinod K. Aggarwal, Ph.D. University of California, Berkeley. Industrial organization, regulation and antitrust, regulation

Mark B. Garman (Emeritus) (George Strauss, Ph.D. Massachusetts Institute of Technology, Industrial relations, negotiations

Laura D. Tyson (Emeritus) (Jonathan B. Berk, Ph.D. Yale University. Theoretical and empirical issues in finance, size-related anomalies

Robert A. Meyer (Emeritus) (Barry M. Staw, Ph.D. University of California, Berkeley. Corporate affairs, social responsibility

John T. Wheeler (Emeritus) (Paul A. Tiffany, Ph.D. University of California, Berkeley. Competitive strategy, business and public policy

Assistant Professors

Jonathan B. Berk, Ph.D. University of California, Berkeley. Information management systems

David Vogel, (Emeritus) (Bergeron Chair of Business Ethics), Ph.D. Princeton University. Business-government relations, social responsibility, ethics, and global business

Michael L. Gertich, Ph.D. University of California, Berkeley. International business, strategic advertising, market research

David A. Alhadeff, (Emeritus) (Mark S. Seasholes, Ph.D. Harvard University. International business, advertising, market research, telecommunications, antitrust

Hector R. Anton, (Emeritus) (Milo W. Smith, Ph.D. University of Virginia. Accounting

Janet L. Yellen, (Emeritus) (L. Melvin Redish, Ph.D. University of Michigan. Economics of population aging, demographic models and labor force participation

Richard M. Thaler, (Emeritus) (Vinod K. Aggarwal, Ph.D. University of California, Berkeley. Behavioral and experimental economics

Vinod K. Aggarwal, (Emeritus) (John T. Wheeler, Ph.D. University of California, Berkeley. Corporate affairs, social responsibility

Trudy L. Kehret-Ward, (Emeritus) (Trudy L. Kehret-Ward, Ph.D. University of Washington. Business ethics, behavior, management, and organizational behavior

Affiliated Professors

Vinod K. Aggarwal, Ph.D. (Political Science)
Joseph V. Farrell, Ph.D. (Political Science)
Richard J. Gilbert, Ph.D. (Economics)
Robert P. Merges, Ph.D. (Law)
Avi Nevov, Ph.D. (Law)
Howard A. Shelanski, Ph.D. (Law)
Stephen M. Shames, Ph.D. (Public Health)

Senior Lecturers

Homa Bahrami, Ph.D. (University of Aston, UK)
Oren E. Eltenberg, M.B.A. (University of Minnesota)
Cristina G. Barros, Ph.D. (University of Minnesota, Minneapolis)
Armin Kehr, Ph.D. (George Ambrosius Chair in International Management, University of California, Berkeley)

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Jurtz L. Kehr, Ph.D. (George Ambrosius Chair in International Management, University of California, Berkeley)

Undergraduate Program

The highly competitive, two-year Haas Undergraduate Program accepts applications from both transfer and continuing UC Berkeley applicants. The program’s goal is to provide students with the knowledge and technical skills necessary to understand the modern business world, to prepare for subsequent graduate work, and to 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 on 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 classroom 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 web site at http://www.berkeley.edu/undergrad. The web site 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:

100—Business Communication

110—Microeconomic Analysis for Business Decisions

115—Macroeconomic Analysis for Business Decision Making

120—Introduction to Financial Accounting

125—Managerial Accounting

150—Organizational Behavior

160—Marketing

170—Social and Political Environment of Business

Beyond these required core courses and other courses outside the Haas School needed to fulfill the degree requirements, business majors must take additional classes from the following nine business disciplines: accounting, business and public policy, economics, finance, public policy, management, marketing, microeconomics, public policy, and public sector management.
The Haas School of Business offers curricula leading to the Master of Business Administration degree and the Ph.D. degree. The Haas School offers four M.B.A. programs: a full-time program for full-time students and an evening program for fully employed students (Evening M.B.A.) that takes three years to complete on a part-time basis.

The M.B.A. Program

The Haas School offers a strong general management program that prepares its graduates to understand the economic, social, political, and technological forces driving global competition and to become effective leaders of modern organizations. The school is increasingly well-known nationally and internationally for its focus on international business, innovation and entrepreneurship, and the management of technology. Unusually flexible in its range of courses and electives for second-year students, the full-time M.B.A. program emphasizes cooperative work in teams and small groups. With approximately 30 percent international students (evenly divided between Europe, Asia, and South America) and more than 30 percent women (31 percent entering in 2000), the program reflects the diverse global environment in which its graduates will pursue their careers. The diverse language 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-sponsored five concurrent-degree programs:

- M.B.A./J.D. with Boalt Hall or Hastings College of the Law
- M.B.A./M.P.H. in health services management with the School of Public Health
- M.B.A./M.A. in Asian studies with the Group in Asian Studies
- M.B.A./M.F.E. in Financial Engineering
- M.B.A./M.I.A.S. in International and Area Studies

In addition, two joint curriculum programs are offered:

- The Management of Technology Joint Program with the College of Engineering leading to a certificate in the management of technology.
- The Real Estate Development Program with the Department of City and Regional Planning and the Center for Real Estate and Urban Economics.

Curriculum. Students in the full-time program must complete 55 semester units to graduate: 29 units of core required courses and 26 units of electives. Core courses may be replaced by electives by passing a waiver exam. There is also a two-year residency requirement.

Haas students may apply 6 units of credit toward their degree from courses outside the department, such as law courses, but only 2 units of credit may be applied toward a degree. The requirement may be taken only if the school determines that the student is not familiar with the related material.

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Haas students may apply 6 units of credit toward their degree from courses outside the department, such as law courses, but only 2 units of credit may be applied toward a degree. The requirement may be taken only if the school determines that the student is not familiar with the related material.

The Ph.D. Program

The Ph.D. program of the Walter A. Haas School of Business is an advanced and scholarly course of study in the functioning of business and its interrelations with the environment. The Ph.D. program emphasizes cooperative work in teams and small groups. With approximately 30 percent international students (evenly divided between Europe, Asia, and South America) and more than 30 percent women (31 percent entering in 2000), the program reflects the diverse global environment in which its graduates will pursue their careers. The diverse language 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-sponsored five concurrent-degree programs:

- M.B.A./J.D. with Boalt Hall or Hastings College of the Law
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Haas students may apply 6 units of credit toward their degree from courses outside the department, such as law courses, but only 2 units of credit may be applied toward a degree. The requirement may be taken only if the school determines that the student is not familiar with the related material.

The teaching and research skills provided by the Ph.D. program have become virtually mandatory for positions in colleges and universities. These skills are also of increasing importance for a small but expanding number of jobs in business and government. These opportunities are likely to be found in consulting, research, and technical advisory firms, with some Ph.D.'s in business administration starting their own companies. While a few may take positions as administrators in large companies, the Ph.D. program is not the best way to prepare for such posts. Those who want a professional degree to prepare for management and responsible administrative positions will find the M.B.A. degree the appropriate course of study.
Compared to the Ph.D. programs at most other universities, the Berkeley plan is strongly discipline and research oriented. Emphasis is placed on preparing students to evaluate existing knowledge and to advance the work in their fields through the application of theory from the social sciences, mathematics, or statistics. The importance of quantitave skills in a variety of fields by study within business administration, but all students must attain sufficient proficiency in and keep pace with an increasingly mathematical literature.

Instruction in the program may be separated into three general periods. The first encompasses formal courses in basic and advanced subjects. The time devoted to these studies, typically two years, depends largely upon a student's prior preparation.

In the second period, directed study, students work closely with faculty at Haas to prepare for research in their selected fields.

In the last period, individual research, students work on their dissertations. Together, periods two and three usually require two to three years to complete.

Preparation for the Ph.D. Program. Admission to the Ph.D. program is open to students with an accredited bachelor's degree or higher, from any field. No preference in admission is given to any previous field of study or to applicants who have had some graduate training. Applicants should possess strong written and oral communications and have a basic understanding of differential calculus.

Ph.D. applications will be evaluated on the basis of evidence of a high level of scholarly ability in both quantitative and qualitative skills, the motivation to complete a strenuous academic program, and a clear statement of career objectives that are consistent with the Ph.D. degree.

Applications for the Ph.D. program may be obtained by writing to the Ph.D. Program Office, Haas School of Business, College of Business Administration, University of California, Berkeley; F655 Faculty Wing #1900, Berkeley, CA 94720-1900; Web site: http://haas.berkeley.edu/Phd.

Lower Division Courses

10. The Corporation and the International Business Environment. (3) Three hours of lecture and one hour of discussion per week. This course provides an introduction to the study of the modern business enterprise. The course 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. 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 Berkeley Seminar Program has been designed to introduce students to the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and from semester to semester. (F,SP)

39AC. Philanthropy: A Cross-Cultural Perspective. (3) Three hours of lecture per week. This class will compare and contrast the variety of gift giving and sharing traditions that make up American philanthropy. Both the cultural antecedents and their expression in this country will be explored from five ethnic and racial groups: Native American, European American, African American, Hispanic, and Asian American. The goal is to gain a greater understanding of the many dimensions of philanthropy as it is practiced in the United States today. This course satisfies the American cultures requirement. (F,SP) Van Loon

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 twelve hours of group study per week. Must be taken on a passed/no passed basis. Organized group study on a subject under the supervision of 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. Theory and practice of effective communication in a business environment. Students practice what they learn with oral presentations and written assignments that model real-life business situations. (F,SP)

110. Microeconomic Analysis for Business Decisions. (3) Students will receive no credit for 110 or 101A. Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 100A or 101A. (F,SP)

111. Macroeconomic Analysis for Business Decisions. (3) Students will receive no credit for 111 after taking Economics 100B or 101B. Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 1, Mathematics 1A or 16A, Statistics 20, or equivalents. Economic analysis applicable to the problems of business enterprises with emphasis on the determination of the level of prices, outputs, and inputs; effects of the state of the competitive environment on business and government policies. (F,SP)

121. Advanced Microeconomic Analysis for Business Decisions. (3) Students will receive no credit for 121 after taking Economics 100B or 101B. Three hours of lecture and one hour of discussion per week. Prerequisites: 110. Analysis of the operation of the market system with emphasis on the factors responsible for economic instability; analysis of public and business policies which are necessary as a result of business fluctuations. (F,SP)

124. Cost Accounting. (3) Three hours of lecture and two hours of discussion per week. Prerequisites: 123. Three to twelve hours of group study per week. Prerequisites: 110 or equivalents. Three hours of lecture and one and one-half hours of discussion per week. (F,SP)

135. Financial Management. (3) Three hours of lecture and two hours of discussion per week. Prerequisites: 123. Three to twelve hours of group study per week. Prerequisites: 110 or equivalents. Three hours of lecture and two hours of discussion per week. (F,SP)

139. Special Topics in Finance. (2-3) Course may be repeated for credit. Two to three hours of lectures per week. Prerequisites: 120 and 123. A variety of topics in accounting with emphasis on current problems and research. (F,SP)

140. Introduction to Management Science. (4) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: 120. Formerly 120B. The uses of accounting systems as their outputs in the process of management of an enterprise. Classification of costs and revenue on several bases for various uses; budgeting and standard cost accounting; analyses of relevant costs and other data for decision making. (F,SP)

124. Cost Accounting. (3) Two hours of lecture and two hours of discussion per week. Prerequisites: 120. Formerly 120B. The uses of accounting systems as their outputs in the process of management of an enterprise. Classification of costs and revenue on several bases for various uses; budgeting and standard cost accounting; analyses of relevant costs and other data for decision making. (F,SP)

125. Auditing. (4) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: 120 and 123 recommended. Concepts and problems in the field of professional verification of financial and related information, including ethical, legal and other professional issues, historical developments, and current concerns. (F,SP)

128A. Federal Income Taxation I. (3) Four hours of lecture and one and one-half hours of discussion per week. Prerequisites: 120 and 121 recommended. Determination of individual and corporate tax liability; income and long-term capital gains; income and long-term capital losses. (F,SP)

128B. Federal Income Taxation II. (3) Four hours of lecture and one and one-half hours of discussion per week. Prerequisites: 128A and 129 recommended. Determination of individual and corporate tax liability; income and long-term capital gains; income and long-term capital losses. (SP)

129. Special Topics in Accounting. (2-3) Course may be repeated for credit. Two to three hours of lectures per week. Prerequisites: 120 and 123. A variety of topics in accounting with emphasis on current problems and research. (F,SP)

130. Financial Management. (4) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: 120. Formerly 120B. Advanced accounting problems. (Required for those specializing in accounting.) (F,SP)

123. Managerial Accounting. (3) Two hours of lecture and two hours of discussion per week. Prerequisites: 120. Formerly 120B. The uses of accounting systems as their outputs in the process of management of an enterprise. Classification of costs and revenue on several bases for various uses; budgeting and standard cost accounting; analyses of relevant costs and other data for decision making. (F,SP)

131. Money and Capital Markets. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 111 and 130. Organizational behavior, and management of financial institutions. Markets for financial assets and the structure of yields, influence of Federal Reserve System and monetary policy on financial assets and institutions. (F,SP)

132. Investments. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 130. Sources of and demand for investment capital, operations of security markets, determination of investment policy, and procedures for analysis of securities. (F,SP)

134. Corporate Finance. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 120. This course will cover the principles and practice of business finance. It will focus on project evaluation, capital structure, and corporate governance. Firms' policies toward debt, equity, and dividends are explored. The incentives and conflicts facing managers and owners are also discussed. (F,SP)

139. Special Topics in Finance. (2-3) Course may be repeated for credit. Two to three hours of lectures per week. Prerequisites: 130. A variety of topics in finance with emphasis on current problems and research. (F,SP)

140. Introduction to Management Science. (4) Three hours of lecture and one hour of discussion per week.
147. Fundamentals of E-Business. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Computer Science 3 or equivalent. A survey course concerned with the importance of computers in organizations, including small groups, universities, firms, government, and society at large. Topics include history of development of computers, characteristics of scientific versus business problems, information storage and retrieval, compilers, problem-oriented languages, simulation models, current developments in computer systems. (F,SP)

148. Planning and Design of E-Business Systems. (4) Three hours of lecture and one- and one-half hours of discussion per week. Prerequisites: Computer Science 3 or equivalent. Study of principles and procedures of management information systems (MIS) planning, design, and analysis in various organizations. Topics include important strategic and implementation strategies of business systems. "Real-world" projects encompassing all phases of systems analysis, feasibility study, systems design, development, prototyping, testing, documentation, and evaluation. Both technical and managerial issues will be emphasized. (F,SP)

149. Special Topics in Manufacturing and Information Technology. (2-3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Computer Science 3 or equivalent. A variety of topics in manufacturing and information technology with emphasis on current problems and research. (F,SP)

150. Introduction to Organizational Behavior. (3) Three hours of lecture per week. A general descriptive and analytical study of organizations from the behavioral science point of view. Problems of motivation, leadership, morale, social structure, groups, communications, hierarchy, and control in complex organizations. The interaction among technology, environment, and human behavior are considered. Alternate theoretical models are discussed. (F,SP)

151. Management of Human Resources. (3) Three hours of lecture per week. Prerequisites: 150. The design of systems of rewards, assessment, and manpower development. The interaction of selection, placement, training, personnel evaluation, and career ladders within an on-going 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: 150. The purpose of this course is to understand the theoretical 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 of all levels. 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 use in actual negotiations (e.g., simulations, cases). (F,SP) Staff

154. Industrial Relations. (3) Students will receive no credit for 154 after taking Economics 151. Three hours of lecture per week. An analysis of manual, white collar, and professional employee relations. Background and functioning of employers and employee organizations. Functioning of labor markets and wage and income security issues. Questions of public policy in labor economics and industrial relations. (F,SP)

159. Special Topics in Organizational Behavior. (2-3) Course may be repeated for credit. Two to three hours of lecture per week. Prerequisites: 150. A variety of topics in organizational behavior and industrial relations with emphasis on current problems and research. (F,SP)

160. Marketing. (3) Three hours of lecture per week. The evolution of markets and marketing; market structure; marketing concept and efficient public and private regulation; the development of marketing programs including decisions involving products, price, promotion distribution. (F,SP)

161. Introduction to Marketing Research. (3) Three hours of lecture per week. Prerequisites: 160. This course is an introduction to product management in marketing consumer and industrial goods and services. The course will cover analysis of marketing information, development of product strategy, programming strategy, and implementation. (F,SP)

165. Advertising. (3) Three hours of lecture per week. Prerequisites: 160. Basic concepts and functions of advertising and the economic consumer motivation; problems in utilizing advertising and measuring its effectiveness. (F,SP)

166. Retailing. (3) Three hours of lecture per week. Prerequisites: 160. History and development of retail management types; geographical structure of retail trade; assortment of goods and services; store management; government regulations. (F,SP)

169. Special Topics in Marketing. (2-3) Course may be repeated for credit. Two to three hours of lecture per week. Prerequisites: 160. A variety of topics in marketing with emphasis on current problems and research. (F,SP)

170. Social and Political Environment of Business. (3) Three hours of lecture or two hours of lecture and one hour of discussion per week. Prerequisites: Senior standing. Study and analysis of American business in a changing social and political environment. Interaction between business and other institutions. Role of business in the development of social values, goals, and national priorities. The expanding role of the corporation in dealing with social problems and issues. (F,SP)

172. Business in Its Historical Environment. (3) Three hours of lecture per week. This course will examine selected aspects of the history of American business. Included will be discussions of the evolution of the large corporation, the development of modern management, changing relationships among business, government, and labor. Also listed as American Studies C172. (F,SP)

175. Legal Aspects of Management. (3) Three hours of lecture per week. 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 the legal problems pertaining to contracts and related topics, business association, and the impact of law on economic enterprise. (F,SP)

176. Legal Aspects of Real Estate. (3) Three hours of lecture per week. Prerequisites: 175. A variety of topics in business and public policy with emphasis on current problems and research. (F,SP)

180. Introduction to Real Estate and Urban Land Economics. (3) Three hours of lecture per week. Prerequisites: Economics 10A or 14 equivalents. 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)

181. Valuation of Real Property. (3) Three hours of lecture per week. Prerequisites: 180 or equivalent. Critical examination of appraisal concepts and methods; the nature of public and private land use; land use valuation; the implementation of public policies affecting urban development. (F)

183. The Financial Management of Real Estate Resources. (3) Three hours of lecture per week. Prerequisites: 180. Real estate debt and equity financing; mortgage market structure; effects of credit on demand; equity investment criteria; public policies in real estate finance and urban development. (SP)

187. International Trade. (3) Three hours of lecture per week. Prerequisites: 110 or equivalent. This course will develop models for understanding the economic causes and effects of international trade, will investigate the effects of economic policies that inhibit trade, and will examine the political economy of trade. By interpreting the findings of the latest theoretical and empirical research in international economics, this course helps students learn how to explore the current political debates in the U.S. and elsewhere regarding the benefits and costs of international trade. (F,SP) Staff
200C-200D. Communicating as a Manager. (1;1) One hour of lecture and two hours of discussion for five weeks. Credit and grade to be awarded on completion of sequence. Prerequisites: Consent of instructor. A critical evaluation of the first semester module is a workshop in the fundamentals of public speaking with a focus on persuasion and advocacy. The spring semester module, strategic business interactions, is concerned with the development of interpersonal skills important to managing organizations. (F,SP)

200Q. Quantitative Methods. (1.5) Three hours of lecture and one hour of optional discussion per week for seven weeks. Prerequisites: Graduate standing. Formerly 200. The objective of the 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)

201A. Economic Analysis for Business Decisions I. (3) Three hours of lecture and one hour of optional discussion per week. Economic analysis applicable to the problems of business and operation of the market system; the determination of prices, inputs, and outputs; effect of the state of the competitive environment on business policies. (F,SP)

201B. Macroeconomics in the Global Economy. (3) Three hours of lecture and one hour of optional discussion per week. Prerequisites: 201A or equivalent. This course will cover the determination of: long run productivity and growth; short run economic fluctuations (in both closed and open economies); exchange rates and the balance of payments; the natural rate of unemployment; and the causes and consequences of inflation. Examples drawn from a variety of countries are used to illustrate theoretical concepts. (SP)

202A. Financial Accounting. (2) Two hours of lecture and one hour of optional discussion per week. A study of accounting measurements for general purpose financial statements, and the effects of the course is to provide a working knowledge and a clear understanding of the contents of published financial statements. (F)

202B. Managerial Accounting. (2) Three hours of lecture and one hour of optional discussion per week for 10 weeks. Prerequisites: 202A or equivalent. 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)

203. Introduction to Finance. (3) Three hours of lecture and one hour of optional discussion per week. This course will examine the wide menu of available assets, the institutional structure of U.S. and international financial markets, and the market 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 the principles governing corporate financial arrangements and contracting. (F)

204. Introduction to Operations Management. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: 200. This course will provide students with an understanding of the basic issues involved in managing a manufacturing-based business and to introduce the tools that are available to deal with these issues. In this context, students will also learn pertinent fundamental concepts in management science that are applicable to other functional areas. (SP)

205. Organizational Behavior. (3) Three hours of lecture per week. 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 function will be examined from multiple theoretical perspectives. Implications for the management of organizations will be debated through examples, cases, and exercises. (F,SP)

206. Marketing Organization and Management. (3) Three hours of lecture per week. Prerequisites: 201A or equivalent. Topics include an overview of the marketing system and the marketing concept, buyer behavior, market research, segmentation and marketing decision making, marketing structures, and evaluation of marketing performance in the economy and society. (F,SP)

207A. Managing Business Ethics in the Global Economy. (1) Three hours of lecture for five weeks. This course provides students with an opportunity to critically analyze and discuss a wide range of ethical issues that confront individual managers and corporations in the United States and other countries. Its objectives are to make students sensitive to the ethical dimensions of both domestic and global business activity and to provide them with a framework for making management decisions in a more responsible manner. (F,SP)

207B. Business and Public Policy. (2) Three hours of lecture for ten weeks. Introduction to political economy, the role of government in a mixed economy, business-government relations, the public policy process, regulation of business, corporate political activity and corporate governance. Compares United States corporate governance systems, public policies and political system to those of Western Europe and Japan. (F,SP)

208. Information Technology Management. (1) Three hours of lecture for five weeks. An intensive overview of key issues that general managers deal with concerning the management of information technology. Topics include decisions regarding technology evaluation, selection and investment, managing technology development and deployment, and “big picture” issues like business reengineering through technology, linking technology to business strategy, etc. (SP)

209. Professional Skills. (1) One hour of lecture per week for seven weeks plus twelve hours of lecture for the eighth week. Must be taken on a pass/fail basis. Prerequisites: Graduate standing. Advanced classes in various computer applications, including EXCEL and PowerPoint with multimedia, online databases, including NEXIS, LEXIS, Dow Jones News Retrieval, and business skills, including interviewing and effective business presentations. (F)

211. Market Failures and Bounds of the Firm. (3) Three hours of lecture per week. Prerequisites: 200, 201A-201B, 204 or equivalents. Efficiency in resource allocation; failure of free markets for mar- kets, decreasing cost phenomena; public goods and public bads (environmental problems); behavior of firms under regulatory constraints. (F)

212. Managerial Decisions in Regulated Industries. (3) Three hours of lecture per week. Prerequisites: 201A or equivalent. Introduction to administrative law and the regulatory process. Economic principles of ad- ministrative regulation of pricing, investment, and ser- vice quality. Analysis of critical problems in regulated industries, including transportation, communications, energy, and financial sectors, with emphasis on emerging competition in these industries. Potential reg- ulatory reforms with alternatives to regulation. (F,SP)

213. Statistical and Econometric Methods for Business. (3) Three hours of lecture per week. Prerequisites: 200, 201A-201B, 204 or equivalents. The theory and use of statistical and econometric methods with special emphasis on practical applications. Topics in- clude regression analysis; special problems in applied regression analysis; simultaneous equations estimation; elements of multi-variate analysis. (F)

214. Forecasting Methods for Business. (3) Three hours of lecture per week. Prerequisites: 200, 201A-201B, 204 or equivalents. The course will focus on a variety of currently used forecasting techniques. These include econometric techniques and purely extrap- olation (time series) methods as well as combinations of more than one procedure. The emphasis is on data analysis; the student will learn a “forecasting process” which can be applied to all types of forecasting prob- lems. To facilitate the “learning by doing” aspect of the course, several computer-oriented problem sets and a forecasting project are required. (F,SP)

215. Management in the Public and Not-for-Profit Sectors. (2,3) Forty-five hours of work per unit per term. Prerequisites: 201A and 201B or equivalents. Planning-programming-budgeting systems and benefit- cost analysis for resource allocation and planning in the public sector. Use of pricing in public enterprise. Ef- ficiency when profit criteria are absent. Applications in natural resources, medical services, transportation, and education. (F,SP)

217. Seminar in Applied Economics. (3) Three hours of lecture per week. Topics will vary with the in- terest of the instructor. A description of the topics and objectives of the seminar will be available to prospective students each year. (F,SP)

220. Corporate Financial Reporting. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 200A or consent of instructor. Formerly 220. This course examines the principles of financial accounting and the issues involved in deter- mining corporate financial reporting policies. It provides an in-depth knowledge of how financial statements are prepared but emphasizes the evaluation of accounting reports from a managerial perspective. Cases sup- plement lecture, discussion, and problem solving. (F,SP)

222. Financial Information Analysis. (3) Three hours of lecture per week. Prerequisites: 200A or con- sent of instructor. Issues of accounting information evaluation with special emphasis on the use of finan- cial statements by decision makers external to the firm. The implications of recent research in finance and ac- counting for external reporting issues will be explored. Emphasis will be placed on models that describe the user’s decision context. (F,SP)

223A. Doctoral Seminar in Accounting I. (3) Stu- dents will receive no credit for 223A after taking 23BA. Three hours of seminar per week. Prerequisites: 200A or equivalent, and Economics 201A-201B. 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)

223B. Doctoral Seminar in Accounting II. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: 200A or equivalent, and Economics 201A-201B. A critical evaluation of recent accounting literature involving empirical research. (F,SP)

223C. Doctoral Seminar in Accounting III. (3) Three hours of seminar per week. Prerequisites: 200A or equivalent, and Economics 201A-201B. Exploration of issues related to the internal accounting systems of large corporations. The first part of the course focuses on the theory of mechanism design, while the second part ap- plies this theory to a variety of managerial accounting issues. (SP)

224. Advanced Managerial Accounting. (2,3) Forty-five hours of work per unit per term. Prerequisites: 200A and 200B or equivalents. This course includes the theory of management accounting, its application
in modern organizations, and related problem areas in-
251. Human Resources Management. (3) Three hours of lecture per week. Prerequisites: 205 or consent of instructor. A study of the problems and techniques associated with managing the personnel function. Topics include the processes of recruitment, selection, training, retention, and evaluation of people within organizations. The role of the staff manager with respect to the planning, design, and allocation of tasks and people is considered, with emphasis on the implications of research for management problems and policies. (F)

252. Negotiations and Conflict Resolution. (3) Three hours of lecture per week. A study of the negotiations process, including negotiations among buyers and sellers, managers and subordinates, company units, companies and organizational agencies, and management and labor. Both two-party and multi-party relations are covered. Course work includes reading, lectures, discussion of case material, and simulations of real negotiations. Emphasis on the role of third parties in resolving disputes. (F)

253. Public Policy and the Management of Human Resources. (3) Three hours of lecture per week. Prerequisites: 205 and 207, or consent of instructor. This course will examine current government regulation of personnel and employment practice issues, including hiring and firing, discipline and termination, harassment, employee rights and responsibilities, unionization, affirmative action, equal pay and comparable worth, employment at will, and union relations. Discussion of case studies will focus on corporate and bureaucratic management and implementation in light of the legal rights and responsibilities of employers and employees. (F,SP)

254A. Research in Micro-Organizational Behavior. (3) Three hours of seminar per week. Prerequisites: Ph.D. student or consent of instructor. Review of the research literature of micro-organizational behavior, including its social psychological and psychological foundations. Topics include: job design, work attitudes, organizational commitment, organizational culture, control and participation in organizations, creativity, personality, socialization leadership, industrial organizational psychology. (SP)

254B. Research in Macro-Organizational Behavior. (3) Three hours of seminar per week. Prerequisites: Ph.D. student or consent of instructor. Review of the research literature of macro-organizational behavior, including its political and social-economic foundations. Topics include: bureaucracy, authority, power and politics, organizational decision making, organizational ecology, resource dependency and transaction costs. (F)

254C. Research in Industrial Relations and Labor. (3) Three hours of seminar per week. Prerequisites: Ph.D. student or consent of instructor. Review of the research literature of industrial relations and labor, including its economic and institutional foundations. Topics include: unionism, wages, productivity, turnover, collective bargaining, strikes and arbitration, government regulation, internal labor markets, and implicit contracts. (F)

254D. Special Research Topics in OB/IR. (3) Three hours of seminar per week. Prerequisites: Ph.D. student or consent of instructor. Review of special research topics in organizational behavior and industrial relations not ordinarily covered in 254 A, B, or C. Possible topics include: history of organizational research; human resource management research; comparative management across national and industrial boundaries. (Course offered alternate years.) (F,SP)

255. Employment and Pay Policy. (3) Three hours of lecture per week. Employment discrimination, and unemployment. Analyses of wage and salary administration and labor market behavior of occupational groups; production and clerical workers, managerial and professional workers. Problems of wage and income policies of the firm, union, and the national economy. (F)

257. Power and Politics in Organizations. (3) Three hours of lecture per week. Prerequisites: 205 or consent of instructor. This course addresses how organizations distribute values and how managers can learn where these resources are concentrated and where they are scarce. Topics include communication skills, control issues, rewards and penalties, and politics within the organization. (F,SP)

258. Creativity in Business. (3) Three hours of lecture per week. Prerequisites: 205 or consent of instructor. This course examines the concept of creativity, bringing to light its nature in individuals, groups, and organizations. The course uses reading materials, cases, classroom, and home exercises to help students understand and be able to use creativity in their own working lives. (F,SP)

259. Special Topics in Organizational Behavior and Industrial Relations. (2-3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 205 or consent of instructor. Formerly 259A. Analysis of research concerning organizational behavior and industrial relations not ordinarily covered in 254 A, B, or C. Topics include the processes of recruitment, selection, training, retention, and evaluation of people within organizations. The role of the staff manager with respect to the planning, design, and allocation of tasks and people is considered, with emphasis on the implications of research for management problems and policies. (F)

260. Consumer Behavior. (2) Two hours of lecture per week. Prerequisites: 206 or equivalent. Examines concepts and theories from behavioral science useful for the understanding and prediction of marketplace behavior and demand analysis. Emphasizes applications to the development of marketing policy planning and strategy and to various decision areas within marketing. (F)

261. Marketing Research: Techniques and Data Analysis. (3) Three hours of lecture per week. Prerequisites: 200 or comparable statistical course. This course develops the skills necessary to plan and implement an effective market research study. Topics include research design, psychological measurement, survey methods, experimental, statistical analysis of marketing data, and effective reporting of technical material to management. Students select a client and prepare a market research study during the course. Course intended for students with substantive interests in marketing. (F)

262A. Product Management. (3) Three hours of lecture per week. Prerequisites: 206A and 206, or equivalent. Focus of this course is on developing student skills to formulate and critique complete marketing programs including product, price, distribution and promotion policies. There is a heavy use of case analysis. Course is primarily designed for those who will take a limited number of advanced marketing courses and wish an integrated approach. (F)

262B. Internet Strategy. (3) Three hours of lecture per week. Prerequisites: 206. The objective of this course is to examine the potential of the Internet for firms’ strategies in marketing goods and services. We will introduce a framework to analyze the Internet’s impact on the communication between firms and consumers and among consumers themselves. This is a workable transition method in evaluating opportunities that arise from the Internet and the Internet. (F,SP)

263. Management of New Products. (2) Two hours of lecture per week. Prerequisites: 206B, 206, or equivalent. Students will learn the methods of new product development and introduction, product portfolio management, and pricing tactics in a variety of settings for both new and mature products. (SP)

264. High Technology Marketing Management. (3) Three hours of lecture per week. Prerequisites: 206 or equivalent. High-technology goods and services which is subject to technological change at a pace significantly faster than for 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)

265. Advertising Management. (2) Two hours of lecture per week. Prerequisites: 206, or equivalent; 260 is recommended. A specialized course in advertising, focusing on management and marketing issues. Topics include: pre-setting, setting, creative decisions, media decisions, budgeting, and examination of theories, models, and other research methods appropriate to these decision areas. Other topics include economic issues of advertising by nonprofit organizations. (SP)

266. Channels of Distribution. (2) Two hours of lecture per week. Prerequisites: 206B, 206, or equivalent. The success of any 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 the channel can be identified and managed. This is accomplished, first, 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. (F,SP)

267. Global Marketing Strategy. (2) Two hours of lecture per week. Prerequisites: 206 or equivalent. This course will cover a wide variety of topics related to the management of international business. Topics include frameworks for developing international marketing strategy; sources and sustainability of competitive advantage; international market structure; marketing and market entry strategy; and integrative marketing strategy with other functional strategies. (F,SP)

268. Seminar in Marketing Management. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 206 or equivalent. Advanced special topics in marketing. Intended particularly for MBA students. Topics will vary from year to year. (F,SP)

269A. Seminar in Marketing: Buyer Behavior. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Advanced topics seminars intended principally for Ph.D. students but open to advanced MBA students. (F,SP)

269B. Seminar in Marketing: Choice Modeling. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Advanced topics seminars intended principally for Ph.D. students but open to advanced MBA students. (F,SP)

270. Seminar in Marketing: Marketing Strategy. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Advanced topics seminars intended principally for Ph.D. students but open to advanced MBA students. (F,SP)

272A-272B. Comparative and International Business and Public Policy. (2-3) Two or three hours of lecture per week. Prerequisites: 207 or equivalent; consent of instructor. This course examines the methods and strategies by which business enterprises and associations attempt to influence public policies, primarily in the United States, with some emphasis on Europe, Latin America, and Japan. It is based upon the impact of the conference, communication and how they affect, at the local, national, and international levels, the public policy process, the business enterprise sys-
279A. Institutions, Interest Groups and Public Policy. (3) Three hours of seminar per week. Prerequisites: Ph.D. student or consent of instructor. Surveys research on decision-making among management institutions, emphasizing a systematic framework for evaluating questions of public policy formation. Explores the new institutionalism in political science, applies the methods of rational choice theory to political problems, and links relevant theoretical and empirical literatures in economics and political science. Considers implications of public choice for 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. Comprehensive introduction to historical development of contemporary capitalism. Class will (1) compare the "classics" in political economy and alternative explanations of markets, politics, class, and culture in industrial development; (2) provide an overview of the history of the United States 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. The course has two main 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 innovation in firm strategy and performance. (F,SP)

280. Real Estate and Urban Land Economics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Intensive review of literature in the theory of land use, urban growth, and real estate market behavior; property rights and competitive analysis; governmental policies affecting real estate market behavior; and effects of government policy and industry structure on economic efficiency. (SP)

281. 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: 280 and consent of instructor. Topics vary each semester. Topic areas include advanced techniques for real estate financial analysis and structuring and evaluation; the securitization of real estate debt and equity; issues in international real estate; cyclical behavior of real estate market prices; and real estate asset allocation. (F,SP).

282. Seminar in Urban Economic Resource Policy. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. The interaction of the urban and non-urban sectors in urban development; modeling 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. (SP)

283. Real Estate Financing. (3) Three hours of lecture and one hour of optional discussion per week. Prerequisites: 280 and background in the basics of finance, micro-economics, macro-economics, statistics, and quantitative analysis. Students will be introduced 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 the complexities of real estate financial market circumstances and real estate evaluation. (SP)

284. Seminar in Real Estate Investment Analysis. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Analysis of selected problems and special studies; cases in residential and non-residential investment; real estate development and redevelopment, real estate taxation, mortgage market development, equity investment, valuation, and zoning. (SP)

285. International Finance. (3) Three hours of lecture per week. Prerequisites: 281B. This course introduces students to the fundamentals of the international financial system, emphasizing the methods of rational choice theory to political problems, and links relevant theoretical and empirical literatures in economics and political science. Considers implications of public choice for corporate strategy and business-government relations. (SP)

287. Theory and Institutions of International Trade. (3) Three hours of lecture per week. Prerequisites: 201A. The course focuses on determinants of global trade flows, patterns of international competition, and governmental policies affecting international trade. Topics include: tariff and nontariff barriers to trade, industrial policies in declining and emerging industries, strategic trade policy, United States trade law, bilateral and multilateral approaches to trade liberalization, and current issues in international finance. (F,SP)

289A. Doctoral Seminar in Real Estate. (4) Course may be repeated for credit with consent of instructor. Three hours of seminar per week. Prerequisites: Ph.D. equivalents of micro and macro economics, finance/accounting, statistics, and doctoral real estate seminar, covering topics related to real estate investment, finance, and market 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

290A. Managing the New Product Development Process. (3) Three hours of lecture per week. Prerequisites: Graduate standing. An operationally focused course designed to introduce students to new product development skills required for successful product development. Through readings, case studies, guest speakers, applied projects, and student research, students discover the basic tools used in nongovernmental problem solving and structure used in new product development management. Course covers processes: idea generation, product definition, product development, testing and refinement, manufacturing ramp-up and product launch. (F,SP)

290B. Intelligent Manufacturing Systems. (3) Three hours of lecture per week. Prerequisites: Graduate standing. This course will study CAD/CAM, rapid prototyping, metal products, semiconductors, electronic packaging, biotechnology, and robotics technologies and includes a hands-on laboratory using CAD and manufacturing techniques. Economic and social drivers, organizational structure, product lifecycle, and future trends are also covered. (F,SP)

290C. International Trade and Competition in High Technology. (2) Two hours of lecture per week. Prerequisites: Graduate standing. This course will study the role of international trade and competition in high technology industries. It will emphasize the interaction between business strategies and the economic and political factors that shape the development and diffusion of new technologies. (F,SP)

292D. Strategic Computing and Communications Technology. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering, business administration, information management and systems, or consent of instructor. Factors strongly impacting the success of new computing and communications products and services (based on underlying technologies such as electronics and software) in commercial applications. Technology trends and limits, economics, standardization, intellectual property, government policy, and industrial organizational. Strategies to manage the design and marketing of successful products and services. Also listed as Electrical Engineering C201 and Information Systems C224. (SP) Messerschmitt, Varian

290E. Introduction to Management of Technology. (3) Three hours of lecture per week. This course gives students an overview of management of technology. It includes the full chain of innovative activities beginning with R&D and extending through production and marketing. Why do many R&D firms fail? What are the technologies? What are the success factors at each stage of innovation? The course introduces students to Haas and College of Engineering faculty working in the relevant areas and student projects at leading high tech firms. (F,SP) Staff

290K. Design as Strategic Management Issue. (2) Two hours of lecture per week. Prerequisites: Graduate standing. This course presents case studies of projects that required intervention to avert catastrophic failure. Students will discuss case studies and review management problems of major corporate projects. They will develop strategic plans to alleviate problems and learn how to manage a large project to a successful completion. (F,SP)

290Q. Quality Improvement: Strategy, Processes, and Customers. (3) Three hours of lecture per week. Formerly 256. This course is intended to provide a strong introduction to students on contemporary issues concerning product and service quality. A major premise is that quality competition has moved rapidly to the foreground as a major arena for competitive struggles, and firms that fail to recognize its importance and develop effective organizational responses will fall by the wayside. (SP)

291A. Speaking As A Leader. (2) One hour of lecture and two hours of discussion per week. Prerequisites: Graduate standing. Leaders must be capable of inspiring commitment in their constituents rather than merely demanding compliance. This course will teach future leaders the elements that are required to inspire successful leaders. This includes consistent 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)

291B. Topics in Managerial Communications. (1-3) Course may be repeated for credit. One to three hours of lecture per week. This course will provide the student with specialized knowledge in some area of managerial communication. Topics include multimedia business presentations, personal leadership development.
292A. Research and Theory in Business: Economics and Management Science. (3) Course is required for doctoral candidates in accounting, finance, and management science. Three hours of lecture per week. Prerequisites: Ph.D. student or consent of instructor. Previous work in statistics and probability theory. The focus is upon defining a research problem, designing and employing specialized techniques to solve the problem. Topics will include concepts of causality, analysis of variance, experimental design, survey research, and multivariate analytical techniques. (F)

292C. Research and Theory in Business: Applied Econometric Methods. (2) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: Ph.D. student or consent of instructor. This course will review, critique, and apply the more specialized statistical and theoretical techniques found in current journal articles in the fields of Accounting, Economic Analysis and Policy, Finance, and Business and Public Policy. It will be a workshop in format with emphasis on empirical research problems faced by enrolled students and the alternate methodologies for dealing with these problems. Course content will vary from year to year. (F)

292D. Research and Theory in Business: Applied Behavioral Science Methods. (2) Course may be repeated for credit. Course is required for first-year students in Business and Public Policy, Organizational Behavior and Industrial Relations, and Marketing. Two hours of lecture per week. Prerequisites: Ph.D. student or consent of instructor. This course will review, critique, and apply statistical techniques found in the behavioral science literature. It will also give students firsthand experience in applying statistical techniques to problems. Course content will vary from year to year. Term paper will be a pass at the statistical work in a student’s dissertation proposal. (SP)

293. Individually Supervised Study for Graduate Students. (1-5) Course may be repeated for credit. Prerequisites: Graduate standing. 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)

294. Selected Topics for MBA Students. (1) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Ph.D. student or consent of instructor. This is a course 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 it will place a special focus on the venture capital process, including how they are formed and managed, accessing the public markets, mergers, and strategic alliances. (SP) Staff

295C. Special Topics in Entrepreneurship. (1-3) One to three hours of lecture per week. Sections 1-10 to be graded on a letter-grade basis. Sections 11-15 to be graded either pass/no pass or satisfactorily/unsatisfactorily basis. Prerequisites: All core courses or equivalents. Courses of this kind will cover issues in entrepreneurship that either appeal to a specialized interest by type of firm being studied (ranging from computer software) or in the aspect of the entrepreneurial process being considered (e.g., new venture funding). The courses typically will be designed to take advantage of the access of students to the community and the expertise of knowledgeable and experienced members of the business community. (F,SP)

295D. New Venture Finance. (2) Three hours of lecture for ten weeks. Prerequisites: 295A or consent of instructor. This is a course 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 it will place a special focus on the venture capital process, including how they are formed and managed, accessing the public markets, mergers, and strategic alliances. (SP) Staff

296. Special Topics in Business Administration. (5-3) Course may be repeated for credit. One-half to three hours of lecture per week. Prerequisites: 201A and 201B (fall) and 7B and 10B (spring) will be offered in Progress. Credit and grade to be awarded on completion of sequence. All other sections are offered on a letter-grade or pass/fail basis. Prerequisites: 242. Advanced study in various fields of business administration. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

296A. Research Seminar in Business Administration. (2-4) Two hours of seminar per week. Prerequisites: 295B and consent of instructor. A series of seminars at which current research on business administration topics is presented. (F,SP) Staff

299D. New Venture Finance. (2) Three hours of lecture per week. Prerequisites: 295A or consent of instructor. This is a course 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 it will place a special focus on the venture capital process, including how they are formed and managed, accessing the public markets, mergers, and strategic alliances. (SP) Staff

299E. Global Strategy and Multinational Enterprise. (3) Three hours of lecture per week. Prerequisites: All core courses. Formerly 299. Identifies the management challenges facing international firms. Attention to business strategies, organizational design, and coordination of research, development, and production activities. Implications for industrial policy and global governance. (F,SP)

299F. Strategic Planning: Perspectives and Decisions. (3) Three hours of lecture per week. Prerequisites: All core courses. Formerly 299. Identifies the management challenges facing international firms. Focus 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, pharmaceuticals, and biotech. The course builds on 205 and Public Health 223A. (F,SP) Staff

601. Individual Study for Master’s Students. (1-5) Course may be repeated for credit. Sections must be taken for a minimum of 16 units. Must be taken on a satisfactory/unsatisfactory basis. Prior to enrollment, students must obtain the permission of a major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the vari-
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 Exam (subject to approval) if they are able to understand, speak, read and write the language. (F,SP)

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 may be on pronunciation, mastering consonant mutations, using several tenses (present, perfect, imperfect, past), and the acquisition of basic vocabulary and idioms. Simple written materials based on traditional Welsh stories will supplement classroom oral-aural work. (F) Klair, Rejhn

70. The World of the Celts. (4) Three hours of lecture per week. An overview of the history of Celtic-speaking peoples from the Iron Age European times, including linguistic/archaeological evidence for the emergence of the Celtic language group in 1st 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. Prerequisites: 15 or 5 and 75. The second semester of Modern Irish. 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 will 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 76 or consent of instructor. Formerly 6B. Continuation of Celtic Studies 16, emphasizing progress in conversation, grammar, and idiom. Using tenses and structures, students will learn how to ask and answer many types of questions and will learn conjugated prepositions and idiomatic uses of prepositions. Future and conditional tenses, irregular and simple relativives will be introduced. Level-appropriate written materials will supplement class work, and students will begin learning about Welsh culture as they learn the language. (SP) Klair, Rejhn

99. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a pass/not passed 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 discussion per week. This course will teach students to speak, read, and write modern literary Breton. We will follow the curriculum established by the only good introductory Breton text in English, which I will supplement with exercises and readings from current Breton publications and contemporary literature. Students will have covered most of the grammar of Breton by the end of the course. Sweetser

102B. Advanced Breton. (4) Three hours of lecture and one optional hour of discussion per week. Prerequisites: 102A. 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. Sweetser

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 capability of reading and to translate (with the aid of dictionary or grammar) any edited text in Old Irish or Middle Irish. 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 to students who have already taken the basic grammar course in Old and Middle Irish (105A) further opportunity to work with important texts written in the period A.D. 700-1200 and to refine the language as well as their grasp of the vernacular tradition as a whole. Texts will include both prose and poetry, and major genres such as epic, legend, and genealogy. Staff

106C. Readings in Modern Welsh. (4) Three hours of lecture and one hour of laboratory per week. Prerequisites: 105B or equivalent or consent of instructor. The emphasis in this course is on reading Welsh literary prose and poetry, and on furthering oral skills (pronunciation, dictum, idiom, oral presentation). There will be a gradual review and augmentation, and the main part of the course will be spent in reading aloud (in Welsh) and translation of plays and poetry chosen from the modern Welsh corpus. Klar

118A-118B. Medieval Irish Literature. (4:4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. A selective study of major surviving works of medieval Irish poetry and prose, with special attention to the relationship between what we would call "literature" and the history and political development of the Celtic peoples, especially Irish, Welsh, Scottish Gaelic and Breton. The course will be coordinated with 105A-105B for those who wish to do some of the readings in the original language. Mella, Holland

119B. Welsh and Arthurian Literature of the Middle Ages. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Formerly 126A-126B. A selective study of key themes in modern Irish literature. Texts will include novels, short stories, poetry, and history and will concentrate on translations of 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

125. Irish Literature in Translation. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Formerly 125A-125B. A selective study of key themes in modern Irish literature. Texts will include novels, short stories, poetry, and history and will concentrate on translations of works originally written in Irish. All work will be read in English, but the course will be coordinated with 75 or 115A-115B for those who wish to do some of the reading in Irish. (F,SP) Staff

126. Welsh Literature in Translation. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Formerly 126A-126B. A selective study of key themes in modern Welsh literature. Texts will include novels, short stories, poetry, and history and will concentrate on translations of works originally written in Welsh. All work will be read in English, but the course will be coordinated with 76 or 116A-116B for those who wish to do some of the reading in Welsh. (F,SP) Staff

128. Medieval Celtic Culture. (4) Three hours of lecture per week. A study of medieval Celtic culture, its society, language, and the daily life of the Celts after their Christianization. All works will be read in English translation. Rejohn

129. Modern Celtic Cultures and Folklore. (4) Course may be repeated for credit under consent of instructor. 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 Celtic "nations without states" from 1500 to the present; an examination of the role of minority cultures and minority languages in larger political cultural entities. These topics will vary each term. Staff

138. Irish Literature. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Gaelic literature 700-1800 (in translation). Study of the prose saga-cycles, satire, classical lyric poetry, and bardic poetry, developing the mythological and traditional background of modern Irish literature. (F,SP) 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,SP) 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. This course continues the Celtic Studies 16-86 sequence. Advanced grammatical instruction and vocabulary building (especially idioms) is emphasized. Students read materials such as newspapers, catalogues, and popular novels. Regular language laboratory attendance is required. (F,SP) Staff

144B. Modern Welsh Level 4. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 144A or consent of instructor. This course continues the Celtic Studies 16-86-144A sequence. Emphasis continues on the mastering the fine details of Welsh grammar (including idioms and accent reduction), and in comprehension of assigned texts. Welsh literature 700-1800 (in translation). Klar, Rejohn

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 Irish designed for students who have completed two semesters of formal instruction. Continues stress on vocabulary building and reading of texts with intensive conversation drills to achieve 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,SP) Keefe

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 Irish literature will be a major focus of the curriculum, but will also be accompanied by advanced grammatical instruction and conversational practice. (F,SP) 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 accompany lectures on important themes in medieval Welsh literature. (F,SP) Klar, Rejohn

146B. Medieval Welsh Language and Literature. (4) Three hours of lecture per week. Prerequisites: 106A or consent of instructor. A selection of medieval Welsh prose and poetry is read in Middle Welsh in conjunct- tion with lectures on key themes in medieval Welsh literature and tradition. (F,SP) Klar, Rejohn

161. Celtic Linguistics. (4) Three hours of lecture and one hour of laboratory per week. Prerequisites: Prior acquaintance with at least one Celtic language, proficiency in Latin, and consent of instructor. Formerly 145. Topics in the linguistics of the Celtic languages. Likely subject matters include synchronic structure of a Celtic language or languages, historical reconstruction of the Celtic language family, phonology and paleography of older Celtic texts, sociolinguistics of the modern Celtic languages, linguistic characteristics of Celtic poetry, and oral traditional literature. (F,SP) Staff

C168. Celtic Mythology and Oral Tradition. (4) Three hours of lecture per week. The course will introduce students to the pre-Christian beliefs of the Celts and Indo-European worlds, to the historical narratives in which such beliefs are embedded, and to the methodology of investigating ancient and medieval belief systems. Also listed as Religious Studies C169. Staff

169. Advanced Readings in Celtic Languages. (4) Course may be repeated for credit with consent of instructor. Three hours of seminar per week. Prerequisites: Successful completion of Celtic Studies 169A or equivalent or consent of instructor. This course will focus on advanced readings in Celtic languages. Klar

170. Topics in Celtic Studies. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly 169A-169B. Topics in this course will be offerings on areas of Celtic language and culture which are not covered in other Celtic studies courses. Topics might include (but would not be limited to) the Celtic romantic tradition, the Celt in films, Celtic art, nationalist politics in Celtic regions, and current trends in Celtic research. (F,SP) Klar

171. Celtic Romanticism. (4) Three hours of lecture per week. From the Classical age to the 21st century, Celts have fascinated people. This course explores the different ways in which Celtic peoples have been perceived by outsiders, and the ways in which Celts have presented themselves to the world. The recurring themes of freedom and independence, as well as the warrior and druid types, are stressed. The course also explores the ways in which the Romantic idealizations of Celts have been appropriated by modern nationalist political movements and by European imperialist ventures. All readings in English. (F,SP) Staff

H195A-H195B. Honors Course. (3:3) Independent study. Prerequisites: Open only to honors seniors in the group major in Celtic Studies. 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. Successful completion of the course will normally, but not necessarily, mean the awarding of honors. (F,SP) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. Group conferences. Must be taken on a pass/no pass basis. Prerequisites: 60 units and in good academic standing. Directed group study on special topics approved by Celtic Studies. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a pass/no pass basis. Prerequisites: 60 units and in good academic standing. Directed individual study on special topics approved by Celtic Studies. (F,SP) Staff

Chemical Engineering
(College of Chemistry)

Department Office: 201 Gilman Hall, (510) 642-2291
Undergraduate Majors Office: 420 Latimer Hall, (510) 642-3452
Chair: Arup K. Chakraborty, Ph.D. Professors
Nilsen B. Salsara, Ph.D. Renosolar Polytechnic Institute. Microstructured polymer materials, light and neuron scattering
Aleksei S. Bell, S.C. Massachusetts Institute of Technology. Heterogeneous catalysis, reaction engineering
Harvey W. Blanch, Ph.D. University of New South Wales. Biochemical engineering, enzyme technology
Elton J. Cairns, Ph.D. University of California, Berkeley. Electrochemistry, energy conversion, thermodynamics
Nitash P. Balsara, Ph.D. Rensselaer Polytechnic Institute. Physical chemistry, semiconductor science
David B. Graves (Vice Chair) Ph.D. University of Minnesota. Mass and neutron chemistry
Enrico Di Marco, Ph.D. Stanford University. Transport in catalysts, catalyst design, reaction engineering
C. Justin King, S.C. Massachusetts Institute of Technology. Separation processes
Sung J. Müller, Ph.D. Massachusetts Institute of Technology. Fluid mechanics, polymer rheology, transport phenomena
John W. Sedlacek, Ph.D. University of California, Berkeley. Surface and colloid chemistry
Jeffrey A. Reimer, Ph.D. California Institute of Technology. Physical chemistry, semiconductor science
Chemical Engineering Minor

A minor in chemical engineering will be awarded to students who have successfully completed five upper division chemical engineering courses as follows: 140, 141, and 150A plus any two courses selected from 142, 150B, 162, 170, 170E, 171, 176, 178, 179, and 181. Students who have completed core courses in both Chemical and Petroleum Engineering at Berkeley that are essentially equivalent to 141 and 150A can substitute other courses from the above list. At least three of the five courses taken for the minor must be numbered 100 or above. Two courses taken for the minor must be taken for a letter grade. Students must achieve at least a 2.0 grade-point average in the courses taken for the minor.

Chemical Engineering Major

The College of Chemistry offers a major in chemical engineering leading to the B.S. degree. The program equips the student for professional work in development, design, and operation of chemical processes and their processes of equipment. Students with high scholastic attainment are well prepared to enter graduate programs. The curriculum is accredited by the Engineering Board of Accreditation for Engineering and Technology.

The requirements for the B.S. degree are: A total of 128 semester units; Mathematics 1A, 1B, 53, 54; Physics 7A, 7B, 7C; Chemistry 4A, 4B, 104A, 104B, 140, 141, 142, 150A, 150B, 152, 154, 157, 160, 162, 185; Engineering 45, 77N; and Electrical Engineering and Computer Sciences 100. Additional technical courses are required to complete one of six interdisciplinary options within the chemical engineering program. Students must satisfy the Subject A, the American History and Institutions, and the Arts and Humanities breadth requirements. Nineteen units in English composition, humanities, and social sciences are required to fulfill the breadth requirement. See the Announcement of the College of Chemistry for additional information about the Chemical Engineering Program.

Undergraduate Research. Students are encouraged to take individual undergraduate research in collaboration with one of their faculty during their junior or senior year.

Double Major Programs with the College of Engineering. Two double major curricula involving the Colleges of Engineering and Chemistry are offered. These are: (1) Chemical Engineering/Materials Science and Engineering and (2) Chemical Engineering/Computer Science. These curricula include the core courses in both departments. Details on these curricula can be found in the Announcements of the College of Chemistry and the College of Engineering.

Intercollegiate Transfers. Transfer applicants are expected to complete, at a minimum, courses equivalent to Chemistry 1A-1B, Mathematics 1A-1B, Physics 7A, and Chemical Engineering 100. Experiments and laboratory work involving the fundamental principles of equipment and measurement technology for microelectronic and microelectromechanical fabrication and manufacturing. The experiments involve investigations of high vacuum systems, plasma-assisted etching and film deposition, high temperature silicon oxidation, photolithography, spin coating, chemical-mechanical polishing, and electroplating. Chemical Engineering C123, Materials Science and Engineering C133, and Electrical Engineering C133. (SP)

140. Introduction to Chemical Process Analysis. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 1B with a grade of C- or better; Mathematics 1B; Physics 7B, which may be taken concurrently; and Engineering 77N. Computer Science 9A or 61A, or an acceptable computer programing transfer course for science or engineering students. Material and energy balances applied to chemical process systems. Determination of thermodynamic properties needed for such calculations. Sources of data. Calculation procedures. (F)

141. Chemical Engineering Thermodynamics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 140 with grade of C- or higher. Thermodynamic behavior of pure substances and mixtures. Properties of solutions, phase equilibria. Thermodynamic cycles. Chemical equilibria for homogeneous and heterogeneous systems. (F)

142. Chemical Kinetics and Reaction Engineering. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 141. Analysis and prediction of rates of chemical conversion in flow and nonflow processes involving homogeneous and heterogeneous systems. (SP)

150A. Transport Processes. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 140 with grade of C- or higher. Principles of heat and mass transfer with application to chemical processes. Diffusion. Conective heat and mass transfer, transfer in boundary layers, analogies. Interphase transfer. Heat- and mass-transfer coefficients; correlations. (SP)

150B. Transport Processes. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 150A with grade of C- or higher. Principles of fluid mechanics and heat transfer with application to chemical processes. Flow in ducts, around submerged objects, and in porous media. Flow measurements. Heat conduction and radiation; heat-transfer coefficients. (SP)

150C. Transport Processes. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 150A with grade of C- or higher. Principles of heat and mass transfer with application to chemical processes. Diffusion. Conective heat and mass transfer, transfer in boundary layers, analogies. Interphase transfer. Heat- and mass-transfer coefficients; correlations. (SP)

152. Separation Processes. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 140 with grade of C- or higher. Principles of fluid mechanics and heat transfer with application to chemical processes. Flow in ducts, around submerged objects, and in porous media. Flow measurements. Heat conduction and radiation; heat-transfer coefficients. (SP)

154. Chemical Engineering Laboratory. (3) One hour of lecture and eight hours of laboratory per week. Prerequisites: 142, 152B; 152, which may be taken concurrently; 185 or demonstration of competence by exam. Experiments in physical measurements, fluid mechanics, heat and mass transfer, kinetics, and separations processes. Emphasis on investigation of basic relationships important in engineering. Experimental design, analysis of results, and preparation of engineering reports are stressed. (F,SP)

157. Transport Processes Laboratory. (3) One hour of lecture and five hours of laboratory. Prerequisites: 150A and 150B, which may be taken concurrently. Physical properties of materials of fluid mechanics, heat, and mass transfer experiments illustrate the application of chemical engineering principles. (SP)
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ciples to modern technologies such as microelectronics processing, biotechnology, and materials processing. (F,SP)

160. Chemical Process Design. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 150B or Civil Engineering 105 or equivalent or consent of instructor. This course will focus on the application of biotechnology and chemical engineering to environmental problems. The course will focus on the application of the basic principles of chemical engineering to the environment. In particular, the class will look at homogeneous and heterogeneous systems. The laboratory part of the course will introduce students to microbial growth, physiology, and genetics and how these can be manipulated to remediate toxic contaminants. In the final part of the course, students will use the microbiology and chemical engineering skills together to solve some very important environmental problems. Case studies from the literature will be used to demonstrate these principles. Heavy emphasis will be placed on the laboratory. (SP)

170L. Biochemical Engineering Laboratory. (3) Six hours of laboratory and one hour of lecture per week. Prerequisites: 170 or 170E (either of which may be taken concurrently). Laboratory techniques for cultivation of microorganisms in batch and continuous reactions. Enzymatic conversion processes. Recovery of biological products. (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)

175. Principles of Electrochemical Processes. (3) Three hours of lecture per week. Prerequisites: 141 or 150B. Principles and application of electrochemical equilibria, kinetics, and transport processes. Technical electrolys and electrochemical energy conversion. (F)

178. Polymer Science and Technology. (3) Three hours of lecture per week; in five of the weeks, one hour of lecture will be replaced with a three-hour laboratory. Prerequisites: 150A or equivalent fluid mechanics; one semester of organic chemistry and physics recommended. Introduction to physical and chemical behavior of organic polymers. Properties of solutions, melts, glasses, elastomers, and crystals. Engineering applications, emphasizing processing technology. Experiments in polymerization and characterization. (F)

179. Process Technology of Solid-State Materials Devices. (3) Three hours of lecture per week. Prerequisites: Engineering 45; one course in electronic circuits recommended; senior standing. Chemical processing and solid-state materials. Crystal growth and purification. Thin film technology. Application of chemical processing to the manufacture of semiconductors and solid-state devices. (SP)

181. Processing of Advanced Polymeric Materials. (3) Three hours of lecture per week. Prerequisites: 150A-150B or equivalents; 178 or equivalent recommended. Study of polymer rheology and polymer processing operations, including extrusion, calendaring, fiber, and film formation, compression and injection molding, and mixing. Process analysis utilizes an understanding of rheology, fluid mechanics, and heat transfer to determine operating characteristics and the development of material structure and properties. (F,SP)

185. Technical Communication for Chemical Engineers. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 140; Satisfactory completion of UC Subject A requirement; Satisfaction of Chemical Engineering English composition requirement and satisfactory language skills of instructor. Development of technical writing and oral presentation skills in formats commonly used by chemical engineers. (F,SP)

H194. Research for Advanced Undergraduates. (2-3) Course may be repeated for credit. Individual conferences. Prerequisites: Honors and senior standing; a minimum GPA of 3.4 overall at Berkeley. Original research under direction of one of the members of the staff. (F,SP)

195. Special Topics. (2-3) 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: Senior standing and consent of instructor. Special laboratory focusing on special direction of one of the members of the staff. (F,SP)

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 pass/not passed basis. Prerequisites: Completion of 60 units of undergraduate engineering and permission of instructor. Supervised research on a specific topic. Enrollment is restricted; see Introduction to Courses and Curricula section in the General Catalog. Gradate 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. Mathematical formulation and solution of problems drawn from the fields of heat and mass transfer, fluid mechanics, thermodynamics, and reaction kinetics employing ordinary and partial differential equations, variational calculus, and Fourier methods. (F)

232. Computational Methods in Chemical Engineering. (3) Three hours of lecture per week. Prerequisites: 230. Open to senior honor students. Introduction to modern computational methods for treatment of problems in the study of analytic solutions. Application of numerical techniques to chemical engineering calculations with emphasis on computer methods. (F)

240. Thermodynamics for Chemical Product and Process Design. (3) Three hours of lecture per week. Prerequisites: Math 53 and 54 or equivalent; open to seniors with consent of instructor. First and second laws of thermodynamics, thermodynamic calculus. Criteria for thermodynamic equilibrium. Thermodynamic properties of pure materials and their relation to molecular constitution. Mixtures. Phase equilibria, chemical reaction equilibria. Thermodynamics of systems under stress, or in electric, magnetic, or potential fields. (F)

244. Kinetics and Reaction Engineering. (3) Three hours of lecture per week. Prerequisites: 142 and 230 or equivalent; open to seniors with consent of instructor. Microscopic processes in chemical reactors: kinetics, catalysis, and reaction kinetics. Interaction of mass and heat transfer in chemical processes. Performance of systems with chemical reactors. (F)

245. Catalysis. (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 in catalysis, activity patterns in catalysis; surface chemistry, catalytic mechanisms and modern 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; electrochemistry and in galvanic cells. Changing mass transfer in ionic media. Criteria of scale-up. (F)

248. Applied Surface and Colloid Chemistry. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Principles of surface and colloid chemistry with current applications; surface thermodynamics, wetting, adsorption from solution, dispersion systems, association colloids, interacting electrical double layers and colloid stability, kinetics of coagulation, and electrokinetics. (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. Design of systems for cultivation of microorganisms and for the separation and purification of biological products. (F,SP)

251. Mass Transfer and Separations. (3) Three hours of lecture per week. Prerequisites: 250, or equivalent. Frames of reference in diffusion, concentrations, and velocity fields in mixtures; fluid mechanics. Diffusion coefficients, multi-component diffusion and heat transfer. Mass transfer at a phase boundary. High rates of mass transfer; mass transfer and chemical reaction. Comparison, evaluation and selection of methods for enhancing separating mixtures. Approaches for selectivity and capacity, reducing energy consumption, and adapting process configurations to separations needs. (F)

256. Advanced Transport Phenomena. (3) Three hours of lecture per week. Prerequisites: 230. Formulation and rigorous analysis of the laws governing the transport of momentum, heat, and mass, with special emphasis on chemical engineering applications. Detailed investigation of laminar flow systems complemented by treatments of turbulent flow systems and hydrodynamic stability. (SP)

259. Special Topics in Chemical Engineering. Prerequisites: Open to properly qualified graduate students. Current and advanced study in chemical engineering, primarily for advanced graduate students. (F,SP)

259B. Electrochemical, Hydrodynamic, and Interfacial Phenomena. (2) Course may be repeated for credit. Prerequisites: Open to properly qualified graduate students. (F,SP)

295C. Applied Molecular Theory for Chemical Engineers. (3) Prerequisites: Graduate standing in Chemical Engineering or consent of instructor. An introduction to quantum and statistical mechanical theories and computational techniques, with the specific purpose of applying these approaches to problems of interest to Chemical Engineers. Elements of Hartree-Fock molecular orbital theory, density functional theory, equilibrium ensemble theory, nonequilibrium statistical mechanics, transition state theory, and molecular simulations are developed and then applied to a wide range of problems. (F,SP)

295D. Development of Biopharmaceuticals. (2) Prerequisites: Graduate standing or consent of instructor. This course will emphasize the fundamental principles that underlie several new technologies within biochemical engineering. Topics to be covered include protein engineering, enzyme and microbe immobilization, metabolic engineering, cellular processes, biosensors, and mathematical models. State-of-the-art de-
developments in these areas will be examined through review of the current literature. (SP)

295E. New Concepts in Heterogeneous Catalysis and Reaction Engineering. (2) Prerequisites: Open to properly qualified chemical engineering and chemistry graduate students. This course surveys new concepts and methods in heterogeneous catalysis and chemical reaction engineering through detailed reviews and discussions of topics from the recent literature. The course covers new inorganic synthesis and spectroscopic characterization methods applied to heterogeneous catalysts, experimental, and theoretical techniques of studies of chemical reactions at surfaces, and modern descriptions of diffusive and hydrodynamic processes within porous solids and chemical reactors. (F.SP)

295O. Chemical Engineering Management. (3) Prerequisites: Graduate standing or consent of instructor. Students will participate in solving open-ended technical and business problems facing management in an industrial organization. Emphasis will be on problem synthesis, creative and strategic thinking, and communication skills. Objectives of the course are to provide an understanding of (1) what is expected of a new engineer in industry, (2) of the viewpoint of management, and (3) of the skills needed for success. (F.SP)

C295R. Applied Spectroscopy. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering, physical 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, the course will survey the various spectrosopic techniques associated with the electromagnetic spectrum, from gamma rays to radio waves. Special emphasis is placed on applications to research problems in applied physical sciences. Graduate researchers interested in systematic in situ process characterization, analysis, or discovery are best served by this course as it is listed as Applied Science and Technology C295R.

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 kinetic and dynamical influences including diffusion; dynamics of growth and etching; surface reaction models; a survey of modern surface microscopies including electron diffraction, auger electron spectroscopy, photoelectron spectroscopy, vibrational spectroscopy, scanning tunneling microscopy, and mass spectrometry.

296. Special Study for Graduate Students in Chemical Engineering. (1-6) Course may be repeated for credit. Individual conferences. Sections 1-4 and 11-25 to be graded on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Special laboratory, research, and directed toward different topics. (F,SP)

298. Seminar in Chemical Engineering. (1) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Open to properly qualified graduate students in chemical engineering. Lectures, reports, and discussions on current research in chemical engineering. Sections are operated independently and directed toward different topics. (F.SP)

299. Research in Chemical Engineering. (1-12) Course may be repeated for credit. Individual conference. Course does not satisfy unit or residence requirements for doctoral degree. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Ph.D. program. Individual study in consultation with the major field advisor for qualified students to prepare them for the examinations required of candidates for the Ph.D. (F.SP)

Professional Courses

300. Professional Preparation: Supervised Teaching of Chemical Engineering. (2) Course may be repeated for credit. Individual conferences and participation in teaching activities. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing, appointment as Graduate Student Instructor, or consent of instructor. Discussion, problem review and development, guidance of large scale laboratory experiments, course development, supervised practice teaching. (F.SP)

Chemistry (College of) (College of Chemistry)


The College of Chemistry comprises two departments, the Department of Chemical Engineering and the Department of Chemistry. Both disciplines have an impact on major world problems. Finding new sources of energy, recovering and utilizing dwindling mineral resources, developing new drugs and food supplies, understanding and protecting the environment, and synthesizing new products biochemically all depend centrally upon chemistry and chemical engineering. Students entering these fields will spend their careers in the middle of the action on these and other highly important areas of research.

Both departments in the College of Chemistry rank nationally and internationally among the most prominent in their fields and both are renowned for their breadth of activity in a diverse range of sub-disciplines and applications. At the same time, with only two departments, the college is a relatively small and comfortable place in which to work. Faculty members have many demands on their time, but students are given close and satisfying contacts with them while in the college.

The college offers programs leading to the B.S., M.S., and Ph.D. degrees in both chemistry and chemical engineering. The B.S. degree in chemistry is intended for students who are primarily interested in careers as professional chemists or wish a thorough grounding in chemistry in preparation for professional or graduate school in chemistry and other disciplines. The B.S. degree in chemical engineering is intended as preparation for a career in chemical engineering and related disciplines. Chemical engineering majors specialize in one of six interdisciplinary areas: Process chemistry, chemical theory, applied physics, biotechnology, chemical processing, environmental technology, or materials science. Also, two B.S. degree double major programs (Chemical Engineering and Materials Science and Engineering, and Chemical Engineering and Nuclear Engineering) are available.

The College of Letters and Science offers a chemistry major leading to a B.A. degree through a curriculum with a greater proportion of courses in the humanities and social sciences than is included in the B.S. chemistry program. It is intended for students interested in careers in teaching, medicine, or other sciences in which a basic understanding of chemical principles is necessary.

Advanced undergraduate and graduate students have opportunities to conduct research in synthetic and structural chemistry of organic and inorganic compounds, chemistry of natural products, theoretical chemistry, nuclear chemistry, physical chemistry, biophysical chemistry, solid-state and surface chemistry, catalysis, polymer science and engineering, photochemistry, bioanalytical chemistry, and food processing and biochemical engineering.

Recommended high school preparation for chemistry or chemical engineering should include chemistry (2 years), physics (1 year); mathematics (4 years, including trigonometry, intermediate algebra, and analytic geometry); and a foreign language (2 years, preferably German, Russian, or French).

For a more specific description of the programs for the various degrees, as well as options for specialization, see the Announcement of the College of Chemistry.

Organizational Units

Chemical Engineering

Department Office: 201 Gilman Hall #1462, 642-2291 Chair: Arup K. Chakraborty, Ph.D.

Chemistry

Department Office: 419 Latimer Hall #1462, 642-5882 Chair: Judith P. Klinman, Ph.D. (College of Chemistry)

University Professor

Yuan T. Lee (Emeritus), Ph.D. University of California, Berkeley. Physical chemistry

Professors

Paul A. Alivisatos, Ph.D. University of California, Berkeley. Physical chemistry

Richard A. Andersen, Ph.D. University of Wyoming. Inorganic and organometallic chemistry

John Arnold, Ph.D. University of California, San Diego. Inorganic and organometallic chemistry

Paul A. Bartlett, Ph.D. Harvard University. Organic chemistry

Robert G. Bergman, Ph.D. University of Wisconsin. Organometallic chemistry

Carlos J. Bustamante, Ph.D. University of California, Berkeley. Biophysical chemistry

Joseph Cerney, Ph.D. University of California, Berkeley. Nuclear chemistry

Arup K. Chakraborty, Ph.D. University of Delaware. Chemical engineering

David Chandler, Ph.D. Harvard University. Theoretical chemistry

Jonathan A. Elliman (Vice Chair), Ph.D. Harvard University. Organic chemistry

Graham R. Fleming, Ph.D. University of London. Physical chemistry

Jean M. J. Fréchet, Ph.D. State University of New York. Physical chemistry

Charles B. Harris, Ph.D. Massachusetts Institute of Technology. Physical, chemical, and analytic chemistry

Robert A. Harris, Ph.D. University of Chicago. Theoretical chemistry

Martin Head-Gordon, Ph.D. Carnegie-Mellon University. Theoretical chemistry

Clayton H. Heathcock, Ph.D. University of Colorado. Organic chemistry

Sun-Ho Kim, Ph.D. University of Pittsburgh. Physical, chemical, and analytic chemistry

Jack F. Kirsch, Ph.D. Rockefeller University. Enzymology, biophysical chemistry, molecular and cell biology

Judith P. Klinman (Chair), Ph.D. University of Pennsylvania. Biochemistry, nucleic acids, biophysical chemistry: molecular and cell biology

William A. Lester, Jr., Ph.D. Catholic University of America. Theoretical chemistry

Marcin M. Majda, Ph.D. Southern Illinois University. Electrochemistry

Michael A. Marletta, Ph.D. University of California, San Francisco. Bio-organic chemistry

Richard A. Mathies, Ph.D. Cornell University. Biophysical, physical and inorganic chemistry

William H. Miller, Ph.D. Harvard University. Theoretical chemistry

Luciano G. Moretto, Ph.D. University of Pavia. Nuclear chemistry

Daniel M. Neumark, Ph.D. University of California, Berkeley. Physical chemistry

Heino Nitsche, Ph.D. Free Universität Berlin. Nuclear chemistry

Norman E. Phillips, Ph.D. University of Chicago. Physical chemistry

Department Office: 419 Latimer Hall #1462, 642-5882 Chair: Judith P. Klinman, Ph.D. (College of Chemistry)
Chemistry Major in the College of Chemistry

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, 7C; Chemistry 4A, 4B, 104A, 104B, 112A, 112B, 120A, 120B, 125, and a choice of 105, 108, 115, or both 143 and 146. In addition to these specified courses, the B.S. chemistry major consists of 11 units of advanced study in chemistry and related fields, including at least one lecture course in chemistry. All courses permit the student to emphasize chemistry in areas of personal interest or to specialize in some related field, such as physics, biology, geology, mathematics, materials sciences, or medicine; or to complete premedical requirements. In addition to these 11 units of advanced scientific courses, a portion of the 15 units of breadth electives (see below) can be used for coherent programs in interdisciplinary areas.

The following requirements must also be satisfied:
- Subject A: American History and Institutions; American Cultures; second-semester foreign language course or equivalent; and a program of 15 units in English composition (English 1A and 1B or equivalent), humanities, and social sciences to fulfill the breadth requirement. See the Announcement of the College of Chemistry for additional information about the chemistry program.

Undergraduate Research. Students are encouraged to take 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, Physics 7A (calculus-based mechanics and wave motion), and English 1A-1B before transfer. In addition, completion of additional chemistry, mathematics, and physical sciences-based physics is encouraged. Please note that course work taken the summer before enrollment is not considered in the selection of applicants.

Chemistry Major in the College of Letters and Science

Major Requirements
- Mathematics: 1A, 1B, and 53 is strongly recommended.
- Physics: 7A, 7B, 7C.

Chemistry: 1A, 1B, and 5 (or 4A, 4B); 104A, 104B, 112A, 112B, 120A, 120B, and 125, and a choice of one of the following: 105, 108, 125.

Honors at Graduation. Upper division students may be admitted to the honors program (Chemistry H194) if they have an overall Berkeley grade-point average of at least 3.4. To be eligible to receive honors in chemistry, candidates for the B.A. degree must (1) earn a grade-point average of at least 3.5 in upper division courses in the major and at least 3.3 overall at Berkeley; and (92) complete at least 3 units of Chemistry H194 or another advanced chemistry course as approved by the department.

Field Major in Physical Sciences

Students interested in this major should see Physical Sciences for the description of the major program.

Chemistry Minor in the College of Chemistry

A minor in chemistry will be awarded to students who have successfully completed one year of organic chemistry (3A-3B or 112A-112B or equivalent), one year of physical chemistry taken at Berkeley (120A-120B or 130A-130B), and two additional upper division chemistry courses taken at Berkeley with the exception of courses numbered 190-199. All of the courses taken for the minor must be taken for a letter grade. Students must achieve at least a 2.0 grade point average in the courses taken at another institution and accepted by the College of Chemistry as equivalent to 3A, 3B, 112A, or 112B. For minors to be awarded, students must submit a notification of completion of the minor at 420 Latimer Hall.

Note: Consult with your college or school for information on rules regarding overlap of courses between majors and minors.

California Teaching Credential

For information concerning the California Teaching credential (Single or Multiple Subject), see the Announcement of the School of Education.

Graduate Programs

Students interested in graduate study are invited to write to the chair of the Department of Chemistry, University of California, Berkeley, 419 Latimer Hall #1460, Berkeley, CA 94720-1460.

Laboratory Fees

The college of Chemistry charges a laboratory fee for each of the following laboratory courses: Chemistry 1A, 1B, 3A, 3B, 4A, 4B, 5, 105, 108, 112A, 112B, 115, 125, and 146.

Lower Division Courses

1A. General Chemistry. Students will receive no credit for 1A after taking 4A. Three hours of lecture and four hours of laboratory per week. Prerequisites: High school chemistry. Required for chemistry, chemical engineering, and biology. (SP)

1B. General Chemistry. Three units of lecture and four hours of laboratory per week. Prerequisites: For nonmajors, 1A or a score of 4 or 5 on the Chemistry AP test. For Chem and Chem Eng. majors, 1A with a grade of C- or higher or a score of 5 on the Chemistry AP test. Chemical bonding, molecular structure, introduction to chemical kinetics, qualitative analysis and descriptive chemistry, introduction to organic chemistry. Special topics: Research topics in modern chemistry and biochemistry. (SP)

3A. Chemical Structure and Reactivity. Courses 3A and 4B will restrict credit if completed before 1B. Two hours of lecture, one hour of discussion, and four hours of laboratory per week. Prerequisites: For nonmajors, 1A or a score of 3.4, or 5 on the Chemistry AP test. For Chem and Chem Eng. majors, 1A with a grade of C- or higher or a score of 4 or 5 on the Chemistry AP test. Introduction to chemical structures, bonding, chemical reactivity, and organic chemistry, aldehydes, ketones, carboxylic acids and amines, electron deficient compounds, amino acids, peptides, carbohydrates, benzene chemistry, 3rd row elements, transition metals, electrochemistry. Wherever possible, examples will be drawn from biological chemistry. (F,SP)

3B. Chemical Structure and Reactivity. Three units of lecture and four hours of laboratory per week. Prerequisites: 3A with a grade of C- or higher. Carboxylic acids and amines, electron deficient compounds, amino acids, peptides, carbohydrates, benzene chemistry, 3rd row elements, transition metals, electrochemistry. Wherever possible, examples will be drawn from biological chemistry. (F,SP)

4A-4B. General Chemistry and Quantitative Analysis. Courses 1A, 1B, 3A, and 3B will restrict credit if completed prior to 4A-4B. Three hours of lecture and five hours of laboratory per week. Prerequisites:
5. Quantitative Analysis. (3) Courses 4A and 4B will restrict credit if completed prior to 5. Two hours of lecture and four hours of laboratory per week. Prerequisites: 1A or 5; scores 670-700 require instructor approval. 4A-4B covers the principles of general chemistry with a more quantitative emphasis than 1A-1B and with considerably more depth. Laboratory emphases include qualitative and quantitative organic synthesis projects. (F,SP)

4A-4B covers the principles of general chemistry with a more quantitative emphasis than 1A-1B and with considerably more depth. Laboratory emphases include qualitative and quantitative organic synthesis projects. (F,SP)

10. Chemical Attractions. (For nonscience majors. Three hours of lecture and one hour of discussion per week. The principles of chemistry permeate everything in the world around us. From the protection of sunscreens and the seductiveness of perfumes to the processes of DNA fingerprinting and art restoration, foods and pharmaceuticals we ingest, chemistry is a crucifer player in improving the quality of our lives. This course will introduce the nonscience major to chemical concepts, properties of various "themes" such as perfumes and chemical communication, pesticides and the environment, diet and exercise, drugs and blood chemistry, art restoration, criminology, and plastics. In lieu of traditional problem sets and laboratories common in chemistry courses, students will prepare critiques of science as it is presented in the media, participate in solving a mock crime, and stage debates about the benefits of chemistry. The course will culminate with project groups whereby students pursue a question or "theme" of their own interest. (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 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. Freshmen seminars are offered in all campus departments, and topics may vary from department to department and semester to semester. Enrollment limited to 15 freshmen. (F,SP)

49. Supplementary Work in Lower Division Chemistry. (1-4) Course may be repeated for credit. Meeting times and procedures may vary depending on the number of students and the availability of facilities. Students may register for one-, two-, or four-unit, with partial credit for courses below lower division. (F,SP)

98. Issues in Chemistry. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Must be taken on a pass/credit basis. Prerequisites: For Chemistry majors. Introduces entering freshmen to resources of the College of Chemistry and the programs of study that they may follow. Includes lectures by senior faculty, introduction to College computer facilities, the opportunity to meet faculty advisers and upperclassmen, and exposure to chemistry in an informal atmosphere, and discussion of College and campus resources. (F,SP)

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 pass/credit basis. Prerequisites: A score of 3, 4, or 5 on the Chemistry portion of the SAT (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 section and from year to year. Representative examples: atmospheric ozone, nuclear waste, solar energy, water, agrichemicals. Students will search information sources, invite expert specialists to speak, prepare oral and written reports. (F,SP)

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 pass/credit basis. Topics vary with instructor. Enrollment restrictions apply. (F,SP)

Upper Division Courses

100. Communicating Chemistry. (1) Course may be repeated for credit. Three hours of lecture per week. Formerly 20. For undergraduate and graduate students interested in improving their ability to communicate their scientific knowledge to teaching chemistry in elementary or secondary schools, and to non-science majors. Lectures and laboratory sessions will include 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 scientific knowledge and receive mentoring on how to improve their presentations. Approximately three hours per week, including time spent in school classrooms. (F,SP)

104A-104B. Advanced Inorganic Chemistry. (3,3) Three hours of lecture per week. Prerequisites: 1B or 4B, or 3A. The chemistry of metals and nonmetals including the application of physical chemical principles. (F,SP)

105. Instrumental Methods of Analysis. (2) Two hours of lecture and eight hours of laboratory per week. Prerequisites: 4B or 5; 104A (may be taken concurrently). Principles and applications of spectroscopic, chromatographic, and electrochemical methods including atomic spectroscopy, mass spectrometry, gas chromatography, spectrophotometric methods, voltammetric techniques. Discussion of instrument design and capabilities. Hands-on laboratory work emphasizing independent projects involving real-life samples. (F,SP)

106. Inorganic Synthesis and Reactions. (2) Two hours of lecture and eight hours of laboratory per week. Prerequisites: 4B or 5; 104A with grade of C- or higher; and 104B (may be taken concurrently). Preparation of inorganic compounds using 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) Courses 3A-3B will restrict credit if completed prior to 112A-112B. Three hours of lecture and five hours of laboratory per week. Prerequisites: 112A: 1B or 4B with grade of C- or higher; 112B: 120A or 130A. Two hours of lecture and one hour of discussion per week. Prerequisites: 130A or consent of instructor. The weekly one-hour discussion is for problem solving and the application of calculus in chemical equilibrium. Molecu- lar structure, intermolecular forces and interactions, biomolecular spectroscopy, high-resolution structure determinations. (SP)

135. Introductory Biochemistry for Chemistry Majors. (2) Two hours of lecture per week. Prerequisites: 3B or 112B, 120A or 130A. One-semester introduction to biochemistry, aimed toward chemistry majors. (F) Kirsch, Klinman

143. Nuclear Chemistry. (2) Two hours of lecture per week. Prerequisites: Physics 7C or equivalent. Radioactivity, fission, nuclear models and reactions, nuclear 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: 143. Formerly C144. Experimental investigations of the inter-relation between chemical and 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)

192. Individual Study for Advanced Undergraduates. (1-3) Course may be repeated for credit. Individual conferences. Prerequisites: Consent of instructor and adviser. All properly qualified students who wish to pursue original research under the direction of one of the members of the staff may do so if their proposed project is acceptable to 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. Prerequisite: Consent of instructor. Prerequisites: 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. Prerequisites: Consent of instructor. Special topics will be offered...
from time to time. Examples are: photochemical air pollution, computers in chemistry. (F,SP)

196. Special Laboratory Study. (2-4) Course may be repeated for credit. Laboratory. Prerequisites: Consent of instructor or graduate standing. Special laboratory work for advanced undergraduates. (F,SP)

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Nonlaboratory study only. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations listed in the General Catalog. (F,SP)

Graduate Courses

203. Chemical Applications of Group Theory. (3) Three hours of lecture per week. Prerequisites: Background in linear and group theory, quantum mechanics, and quantum chemistry. (F,SP)

208. Structure Analysis by X-Ray Diffraction. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. (3;3;3)

204A-204C. Advanced Topics in Inorganic Chemistry. (3;3;3) Three hours of lecture per week. Prerequisites: 204A or consent of instructor. Three hours of laboratory per week. Prerequisites: 204A and 204C. 204A emphasizes bonding in inorganic materials as molecular species and in crystal lattices. (F)

207. Inorganic Chemistry. (3) Three hours of lecture per week. Prerequisites: 204A or consent of instructor. Three hours of laboratory per week. Prerequisites: 204B and 204C. 204A emphasizes bonding in inorganic materials as molecular species and in crystal lattices. (F)

208. Structure Analysis by X-Ray Diffraction. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. (3;3;3)

209. Physical Chemistry. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Three hours of laboratory per week. Prerequisites: 209A or consent of instructor. (3;3;3)

210A. Physical Organic Chemistry. (3) Three hours of lecture per week. Prerequisites: 112A or consent of instructor. Bonding theory, kinetics and equilibria, reaction mechanisms. (F)

210B. Physical Organic Chemistry. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor or graduate standing. Three hours of lecture per week. Prerequisites: 210A and consent of instructor. Physical organic chemistry with application to specific topics (e.g., polymer chemistry). (SP)

211A. Synthetic Organic Chemistry. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. (3;3;3)

212. Bioorganic Chemistry. (3) Three hours of lecture per week. Prerequisites: 112A-112B or consent of instructor. Topics of current interest in biological chemistry, including structure and chemistry of nucleic acids and proteins, biological recognition, catalysis, protein folding, protein engineering, drug design and signal transduction. Extensive use will be made of "case histories" from the recent literature. (SP)

213A-213B. Introduction to Organic Research. (1-1) Three hours of lecture per week. Prerequisites: 213A: Three hours of lecture per week. Prerequisites: 213A or consent of instructor. Three hours of lecture per week. Prerequisites: 213A or consent of instructor. Introduction to organic research with emphasis on NMR spectroscopy. Required for graduate students in the synthetic program. Fall semester laboratory provides basic practical skills needed to operate NMR spectrometers. Spring semester lecture provides a basic theoretical treatment of the skills learned in the fall. (F,SP)

220A. Thermodynamics and Statistical Mechanics. (3) Three hours of lecture per week. Prerequisites: 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: 120B and 122 or equivalent. Introduction, one dimensional problems, 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, scattering theory. Molecular and many-body quantum mechanics. (SP)

222A. Chemical Kinetics. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. (3;3;3)

222B. Chemical Dynamics. (3) Three hours of lecture per week. Prerequisites: 222A and 222A. Planar mechanical scattering theory of elastic, inelastic, and reactive collisions. Electronically non-adiabatic processes. Coherence and scattering resonances. Semi-classical and quantum mechanical collision. Generalized statistical models for chemical reactions. (SP)

230. Protein Chemistry, Enzymology, and Bioorganic Chemistry. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. The topics covered will be chosen from the following: protein structure, denaturation, and folding; RNA catalysis; protein-protein and nucleic acid interactions; protein engineering; drug design and development; catalytic antibodies. Intended for graduate students in chemistry, biochemistry, and molecular biology. Also listed as Molecular and Cell Biology C214. (SP)

231A-231C. Advanced Biophysical Chemistry. (3;3;3) Three hours of lecture per week. Prerequisites: 231A: Graduate standing or consent of instructor. Three hours of lecture per week. Prerequisites: 231A or consent of instructor. Three hours of lecture per week. Prerequisites: 231B and 231C. Quan-

243. Advanced Nuclear Structure and Reactions. (3) Three hours of lecture per week. Prerequisites: 143 or equivalent and introductory quantum mechanics. Selected topics on nuclear structure and nuclear reactions. (F)

255. Advanced Analytical Chemistry I. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Formerly 250. State-of-the-art techniques in modern analytical chemistry will be presented in areas including mass spectrometry, electrochemistry, and separations. Prerequisites: Ph.D. emphasis will be on instrumentation, methods, detection, and recent applications. (SP)

299. Research for Graduate Students. (1-9) Course may be repeated for credit. Laboratory. Prerequisites: Graduate standing. The facility of the laboratory is available at all times to graduate students pursuing original 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. (1-6) 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. 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 in chemistry with 3 years of graduate student teaching experience. Discussion, curricula development, class observation, and practice teaching in chemistry. (F,SP)

301A. Undergraduate Lab Instruction. (2) Course may be repeated once for credit. One hour of lecture and four hours of tutorial per week. Must be taken on a passed/not passed basis. Prerequisites: Junior standing or consent of instructor: 1A-1B with grade B- or higher. Tutoring of students in 1A-1B laboratories. Students attend one hour of the regular GSI preparatory meeting and hold one office hour per week to answer questions about laboratory assignments. (F,SP)

301B. Undergraduate Chemistry Instruction. (2) Course may be repeated once for credit. One hour of lecture and five hours of tutorial per week. Must be taken on a passed/not passed basis. Prerequisites: Junior standing or consent of instructor: 1A-1B with grade B- or higher. Formerly 301. Tutoring of students in 1A-1B. Students attend a weekly meeting on tutoring methods at the Student Learning Center and attend 1A-1B lectures. (F,SP)

301C. Chemistry 3 Lab Assistant. (2) Course may be repeated once for credit. One hour of preparation meeting, four hours of instruction in the laboratory, and one hour of laboratory experiment preparation. Must be taken on a passed/not passed basis. Prerequisites: Sophomore standing and consent of instructor: completion of 3B with grade "B" or higher. Undergraduate organic lab assistants help in the teaching of the 3A-3B laboratories. Each week students attend a laboratory preparation meeting for one hour, assist in the laboratory section for four hours, and help in the development of experiments for one hour. (F,SP)

301T. Undergraduate Preparation for Teaching or Instruction in Teaching. (2) Course may be repeated for a maximum of 8 units. Two or three hours of lecture and one hour of teacher training per week. Prerequisites: Junior standing, overall GPA 3.1, and consent of instructor. (F,SP)

301W. Supervised Instruction of Chemistry Scholars. (2) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Sophomore standing and consent of instructor. Tutoring of students in the College of Chemistry Scholars Program who are enrolled in 1A-1B or 112A-112B. Students attend a weekly meeting with instructors. (F,SP)
Chicano Studies
(College of Letters and Science)

Program Office: 506 Barrows Hall, (510) 643-0796
Chair: Jose David Saldivar, Ph.D.

Professors
Norma Alarcón, Ph.D.
Jesús O. Saldivar, Ph.D.
Mario Barrera (Emeritus), Ph.D.
Carlos Muñoz, Jr. (Emeritus), Ph.D.

Associate Professors
Alfred Arteaga, Ph.D.
Beatriz Manz, Ph.D.
Alex M. Sarageza, Ph.D.
Margarita Melville (Emerita), Ph.D.

Assistant Professor
Laura Pérez, Ph.D.

Adjunct Lecturer
Lourdes Parra, Ph.D.

Undergraduate Major Adviser: Ms. Jimenez-Olvera.

Undergraduate Program

The Chicano studies major offers an interdisciplinary curriculum of academic study that critically examines the historical and contemporary experiences of people of Mexican descent in the context of American society and institutions. Moreover, in light of continuous immigration from Mexico, and now Central America, the Chicano studies major curricular provides the study of particular aspects of Mexican history, culture and politics as they bear upon the Chicano community, past and present. Emphasis is given in the major to the student developing a broad knowledge of the Chicano experience. Thus, the major stresses the analysis of the interrelationships in the historical background, cultural patterns, and artistic expression of the Chicano community, in order to acquire a well-rounded, in-depth understanding of the contemporary interface between Chicanos and American society. In this connection, the major strives to incorporate various disciplines in its approach, such as political science, sociology, anthropology, history, literary criticism, and art. Through the interdisciplinary nature of our curriculum, the major is aimed at preparing students for incorporation into the world of work and for a wide range of advanced graduate work and/or professional training in various fields.

Major Requirements

Note: Some of the courses included in the major curriculum are pending approval. Please consult the online catalog or a departmental adviser for further information.

The major in Chicano studies consists of 12 courses for a total of 48 units.

Lower Division
Ethnic Studies 10A, 10B; completion of four courses from Chicano Studies 20, 40, and 50.

Upper Division
Ethnic Studies 101A, 101B, and 103; completion of four courses from Chicano Studies 101, 141, 143, 150B, 159, C161, or an approved course from another department; Chicano Studies 197 (4 units cumulative).

Honors Program

The Chicano Studies program provides an option leading to the A.B. degree with honors. Students must have junior standing; a 3.3 University GPA, and a 3.3 GPA in the major. The honors thesis consists of a 6-unit research project. The faculty will establish criteria and grade the project. For more information, see the Chicano Studies advisor in 532 Barrows Hall.

The Minor in Chicano Studies

Note: Some of the courses included in the minor curriculum are pending approval. Please consult the online catalog or a departmental adviser for further information.

Requirements.
The minor in Chicano studies consists of five upper division courses for a total of 20 units: Ethnic Studies 101A or 101B, and completion of four of the upper division courses listed in the major requirements (not including Chicano Studies 197).

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. (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 contemporary Chicano art. Special focus on the mural movements and the relationship between artistic production and the development of Chicano symbols and cultural production.

133. Chicano Music. (4) Three hours of seminar per week. What is Chicano 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 shape and been shaped by popular music and popular culture? How has Chicano music been a music accommodation and/or resistance? What role have Chicano artists and musicians played as cultural workers? Does Chicano music have a political agenda? How have Chicano artists and recording companies fared in the music industry? There are a few of the questions we will consider in this course. Course goals and objectives will be accomplished through readings, research, guest lectures, per- formance, film, and listening to Chicano music. Classroom discourse will be the key ingredient to the success of this course.

135. Chicano/Latino Film. (4) Three hours of lecture per week. Prerequisites: Sophomore standing. Analysis of films by and about Latinos in the United States. Features are emphasized, with limited coverage of documentaries. This course serves both as an introduction to the Latino experience and to the analysis of narrative film. (F) Barrera

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) Alarcón

142. Major Chicano Writers. (4) Three hours of lecture per week. Prerequisites: 40. Critical analysis of the works of major Chicano Playwrights, Poets and Fiction Writers. Alarcón

143. Chicano and Latin American Literature. (3) Three hours of lecture per week. Prerequisites: 40 recommended. A study of 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. (SP) Alarcón

145. Contemporary Issues of Chicanas. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 40 recommended. This course examines contemporary issues facing Chicanas in the U.S. The scope is historical-structural and examines political, and economic arrangements resulting in race, class and gender-based inequalities. An individual and community scope examines the variations of: a) class, racial/ethnic and gender identity; b) social integration, and c) responses to structural barriers. (F)

149. Creative Writing. (3) 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.

150A. History of the Southwest: Spanish and Mexican Period. (4) Three hours of lecture per week. Pre-
City and Regional Planning

(College of Environmental Design)

Department Office: 228 Wurster Hall, (510) 642-3256
http://www-crdp.berkeley.edu/

Chair: Frederick C. Collignon, Ph.D., A.I.C.P.

Professors

Nezar AlSayyad, Ph.D. University of California, Berkeley. Architecture design
Peter Bosselman, M.Arch. University of California, Los Angeles. Urban design, public communication
Manuel Castells, L.L.B. Ph.D. University of Paris. Urban sociology
Robert B. Cervero, M.C.P. Georgia Institute of Technology. Ph.D. University of California, Los Angeles. Transportation planning, planning methods
Stephen S. Cohen, Ph.D. London School of Economics. Economic development
David E. Dowall, M.U.R.P., Ph.D. University of Colorado. Urban economics
Judith E. Innes, Ph.D. Massachusetts Institute of Technology. Social policy analysis
Allan B. Jacobs, J.D. City University of New York. Urban design and planning
John Lands, M.C.P., Ph.D. University of California, Berkeley. Housing, urban economics, public finance
Michael Southworth, Ph.D., M.C.P. Massachusetts Institute of Technology. Urban design, environmental psychology, city planning
Martin Wachs, Ph.D. Northwestern University. Transportation policy
Edward Blakely (Emeritus), Ed.D. University of California, Los Angeles. Local economic development, rural development, biotechnology
Donald L. Foley (Emeritus), Ph.D. Washington University. Metropolitan regional development
Peter Hall (Emeritus), Ph.D. Cambridge University. Metropolitan planning
Ira Michael Heyman (Emeritus), LL.B. Yale Law School. Land use planning
Richard L. Meier (Emeritus), Ph.D. University of California, Los Angeles. International urbanism
Roger Montgomery (Emeritus), M.Arch. Harvard University. Community development
Michael B. Teitz (Emeritus), Ph.D. University of Pennsylvania. Urban economics and housing
Irene Tinker (Emeritus), Ph.D. London School of Economics. Development planning: women in planning
Friso Violck (Emeritus), B.S. University of California, Berkeley. Land use planning
Melvin M. Webber (Emeritus), M.C.P. University of California, Berkeley. Planning theory, social programs

Associate Professors

Frederick C. Collignon, Ph.D., A.I.C.P. Harvard University. Urban economics
Elizabeth Deakin, M.S. Massachusetts Institute of Technology. Urban planning, transportation planning
Timothy P. Duane, Ph.D. Harvard University. Environmental planning, energy issues, infrastructure
John D. Radke, Ph.D. British Columbia. Geographic information systems, environmental planning, database management
AnnaLee Saxeman, M.C.P. University of California, Berkeley. Public policy, environmental policy, transportation planning

Assistant Professors

Karen Christensen, Ph.D. University of California, Berkeley. Planning theory, housing
Robert S. Ogive, Ph.D. Columbia University. Community development

Adjunct Professors

Arthur Blau, Ph.D. California University. Public policy, environmental policy, transportation planning
Michael Smith-Helm, Ph.D. University of California, Berkeley. Housing, community finance, project management

Department Overview

The planning of cities is as old as urban civilization, but the present-day profession has emerged in response to the rapid growth, changing character, and critical problems of 20th-century urban development. As an established part of urban government, city planners have continued their primary responsibility of making recommendations for the physical development and design of urban areas. Planning techniques are likewise employed by large scale private developers. Theorists and researchers in other disciplines have become increasingly interested in urban problems, and their work, often in partnership with urban planners, is contributing to greater knowledge and more sophisticated methods in planning practice. City and regional planning claims more than 25,000 professionals in the United States, most of them members of the American Planning Association or the American Institute of Certified Planners.

Characteristically, city, county, and metropolitan regional planning agencies are responsible for recommending guidelines for channeling the urban physical development of their respective jurisdictions. City planners are also relied upon in other types of public agencies— including local, state, and federal agencies—dealing with transportation, housing, urban renewal, community development, public works, economic development, human and natural resources development, education, and health. A significant fraction of the profession engages in consulting to city planning and other governmental agencies and to private firms of various sorts.

The Department of City and Regional Planning offers a two-year graduate program of professional education in the field of city and regional planning leading to the degree, Master of City Planning, which is a recognized degree within the Planning Accreditation Board. The department also offers a Ph.D. degree in city and regional planning. The departments of Architecture, Landscape Architecture and Environmental Planning, and City Planning have established concurrent programs enabling students to obtain two master's degrees in less time than is required in separate pursuit of those degrees. In addition, the department has established concurrent programs with the School of the Law, the School of Public Health, and the Transportation Group of Civil and Environmental Engineering.

These programs reflect the expanding concern of city planners with a wide variety of urban and regional problems and the search for the empirical and theoretical understanding necessary to attack those problems. Courses in planning theory and practice are supplemented both within and outside the department by courses in the basic structure and functioning of the urban system from many viewpoints. Some of these courses are open to qualified undergraduate and graduate students in related fields. For more detailed information about these curricula, consult the Announcement of the College of Environmental Design or the Department of City and Regional Planning, 228 Wurster Hall.

Undergraduate Course Work. There is no undergraduate major offered in the Department of City and Regional Planning. However, a city and regional planning minor is open to all undergraduate majors. The University recognizes this core course work by recording the completed minor on the student’s official transcript. Students may obtain course lists, requirements, and further information from the College of Environmental Design Undergraduate Office, 232 Wurster Hall.

Lower Division Courses

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. Small-seminar sections are offered in all campus departments; topics vary from department to department and from semester to semester.

97. Field Studies in City and Regional Planning. (1-3). Course may be repeated for credit. Three hours of field work per week per unit. Must be taken on a passed/not passed basis. Supervised experiences in
the study of off-campus organizations relevant to specific aspects of city planning. Regular individual meetings with faculty and sponsored report are required. (F,SP)

111. Introduction to Housing: An International Survey. (3) Three hours of lecture/discussion per week. Prerequisites: 110 or Economics 1 or consent of instructor. Open to majors in all fields. Housing problems, housing policy, and housing as a field of urban planning practice. Emphasis on critical international issues in the Third World and the United States. (F,SP)

112A. The Idea of Planning. (3) Three hours of lecture per week, Open to all majors in all fields. Planning is often called for in response to societal crises: thus, nature and criticisms of the planning idea, appropriateness of planning, sources of legitimacy and justifications of planning, and future directions of the planning idea are examined. (F,SP)

112B. Planning and the Market in United States. (4) Four hours of lecture/discussion per week. Prerequisites: 113A or equivalent or open to all majors in all fields. The evolution of economic planning in the U.S. from 19th century to present, tracing changing theoretical justifications for government intervention in the economy and highlighting the distinctive aspects of the U.S. experience. Prerequisites: 113A or equivalent economic course. Survey of the economic and planning in the U.S. from 19th century to present, tracing changing theoretical justifications for government intervention in the economy and highlighting the distinctive aspects of the U.S. experience. (F,SP)

113A. 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. Prerequisites: Open to all majors in all fields. Prerequisites: Open to all majors in all fields. Micro-economic theory is reviewed. (SP)

113B. Community and Economic Development, (3) Three hours of lecture/discussion per week. Prerequisites: 113A or equivalent or open to all majors in all fields. Introduction to political, economic and social issues involved in theory and practice of community economic development. Themes focus on national economic and social policies, role of local community economic development corporations (CDCs), resolution of conflicts between private sector profitability and public sector (community) accountability through critical use of the planning process. (SP)

114. Introduction to Urban and Regional Transportation, (3) Three hours of lecture/discussion per week. This course is designed to introduce students to the methods by which the transportation system is managed. The methods through which they are planned and analyzed, and the dimensions of key policy issues confronting decision makers. (SP)

115. Urbanization in Developing Countries, (3) Three hours of lecture/discussion per week. Lectures will cover the following topics: urbanization, urbanization, and international relations; process of rural-urban migration; urban marginality in the Third World; metropolitan policies; the case of transportation; the role of governmental agencies: the World Bank; Third World energy problems. (SP)

116. Urban Planning Process—The Undergraduate Planning Studio, (4) Four hours of lecture/discussion per week plus fieldwork. Prerequisites: Upper division standing; consent of instructor or open to all majors in all fields. An introduction to the planning process with practical in using planning techniques. 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)

117. Minorities and Gender in Planning, (3) Three hours of lecture/discussion per week. Examination of how the physical development of cities and urban programs have shaped the lives and social roles of all minority groups and women, and vice-versa. Assessment of past and current alternative future planning policies that are equitable and can be explored. (F,SP)

118AC. The Urban Community, (3) Three hours of lecture/discussion per week. Prerequisites: 110 or consent of instructor. This course looks at the idea of community in cities and suburbs and at the dynamics of neighborhoods. It will address particularly how these play a central role in planning at the local level. Topics include urban social geography, residential choice considerations, minority communities and neighborhoods, the political economy of neighborhoods, and planning and policy for neighborhoods in the city. This course fulfills the American cultures requirement. (F,SP)

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 lenses: lectures, discussions, student projects, and guest appearances by leading practitioners in Bay Area sustainability efforts. Ways to coordinate goals of environment, economy, and equity at all different scales of planning are addressed, including the region, the city, the neighborhood, and the site. (F)

197. Field 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 field work per week per unit. 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 sponsored report are required. (F,SP)

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. Three hours of lecture/discussion per week. Must be taken on a passed/not passed basis. Group studies designed to meet specific needs of students. (SP)

199. Special 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. Three hours of lecture/discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Regular meeting 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 city planning profession in the context of urban history. Principal focus on the evolution of North American city planning since the late 19th century; some comparative and earlier material. (F)

Landis

201. Urban Social Theory and Policy, (3) Three hours of lecture/discussion per week. Explores recent and contemporary thinking on the roots, consequences, and policy responses to many of the major social and political issues and problems facing urban America. Also examines the recent history, from the war on poverty, and the effectiveness of federal and state policy responses to these issues. We will identify and discuss future policy options. (SP)

202. Public Economics, (3) Three hours of lecture/discussion per week, Prerequisites: 113A or equivalent. Roles of governmental agencies as producers of urban services: tax, services: tax, public finance, taxation, and budgeting; measurement of benef- eits and costs; criteria and procedures for investment decisions concerning types and qualities of services and facilities. Required core course. C203. Development Theories and Practices, (3) Three hours of lecture/discussion per week. This course examines how concepts and theories of “development” have been produced, maintained, used, and challenged in different regions of the world economy. It will offer a framework for analyzing how changing and contending models of development both reflect and shape social processes and practices. Also listed as Geography C214.

204. Analytic and Research Methods for Planners, (3) Three hours of lecture/discussion per week. This course introduces students to analytic techniques for solving planning and policy problems. Course focuses on applying (I) statistical and (II) qualitative techniques to solve planning and policy problems; (II) multivari- able techniques such as chi-squared and linear regression; (III) advanced multivariate techniques such as multiple regression, logit analysis, and modeling. Cervera

204A. Research Methods for Planners, (2.3) Four and one-half hours of lecture/discussion per week for seven weeks (2 units). Four hours of lecture/discussion per week for seven weeks (3 units). Field research methods for planning problems is included. The course will cover a cluster of methods. Students may take sequentially two or three modules in one semester.

204A. Methods of Planning Data Analysis, (3) Three hours of lecture/discussion per week. Introduction to the use of quantitative reasoning and statistical tech- niques to solve planning and policy problems. Course focuses on applying (I) statistical and (II) qualitative techniques to solve planning and policy problems; (II) multivari- able techniques such as chi-squared and linear regression; (III) advanced multivariate techniques such as multiple regression, logit analysis, and modeling. Cervera

204B. Research Methods for Planners, (2.3) Four and one-half hours of lecture/discussion per week for seven weeks (2 units). Four hours of lecture/discussion per week for seven weeks (3 units). Field research methods for planning problems is included. The course will cover a cluster of methods. Students may take sequentially two or three modules in one semester.

204C. Introduction to GIS and City Planning, (3) Three hours of lecture/labouratory per week. Introduction to the principles and practical uses of desktop mapping soft- ware. 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 systems and applications. Prior or desktop mapping experience not required. Landis

204D. Multivariate Analysis in Planning, (3) Four hours of lecture/discussion per week for 10 weeks. Prereq- uisites: 204A or equivalent. Theory and application of advanced multivariate methods in planning. Emphasis on classical modeling of social and economic data. Topics include: multiple regression analysis; residual analysis; weighted least squares; non-linear models; path analy- sis; log-linear models; logit and probit analysis; prin- cipal components; factor and cluster analysis. Com- pletion of two computer assignments, using several microcomputer statistical packages, is required. Cervera

205. Introduction to Planning and Environmental Law, (3) Three hours of lecture/discussion per week. An introduction to the American legal process and the legal framework within which public policy and planning problems are addressed. The course stresses legal methodology, the basics of legal research, and the common-law decisional method. Statutory analysis, ad- ministerative law, and constitutional interpretation are also covered. Case topics focus on the law of planning, property rights, land use regulation, and access to housing.

206. Planning Institutions and Organizations, (3) Three hours of lecture/discussion per week. Prereq- uisites: Consent of instructor or open to all majors in the physical planning agency in municipal and metropoli- tan governments; major alternative definitions of city planning; relationship of long-term physical plan to urban and regional development agencies, significance of city plan- ning legislation in reorganization of local government. Christensen
207. Land and Housing Market Economics. (3) Three hours of lecture/discussion per week. Prerequisites: 113A or equivalent. Using microeconomics as its platform, this course is designed to develop analytical skills useful in analyzing the economic behavior of households, firms, and governments including the role of public and private sector developments, in central city and suburban locations.

238. Development—Design Studio. (4) Two hours of lecture/seminar and four hours of studio per week. Prerequisites: 225. Studio experience in analysis, policy advising, and project design or general planning preparation for urban communities undergoing development, with a focus on site development and project planning.

239. Housing Policy Seminar. (3) Three hours of seminar per week. Prerequisites: 230 or consent of instructor. Discussion, reading, and directed research on housing policies—their history, formulation, implementation, and evaluation.

240. Theories of Urban Form and Design. (3) Three hours of lecture/discussion 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 relations between urban form and social, economic, and geographic factors. Using a case study approach, students will develop a fundamental understanding of the role of planning in the urban environment.

C241. Research Methods in Environmental Design. (4) Three hours of seminar/two hours of laboratory per week. Formerly Interdepartmental Studies 247. The component studies will focus on the urban environment. Environmental problems, attitudes, and criteria. Environmental survey, analysis, and interview techniques. Methods of addressing environmental quality. Environmental simulation. Also listed as Landscape Architecture C241. (F) Bosselman

242. Urban Design Research Seminar. (1) Two hours of laboratory every second week. Special topics in urban design research directed to the understanding of policies that support and enhance the experience of people. Research focuses on a range of issues including the physical transformation of urban places or the analysis of urban design projects and plans. Also listed as Architecture C207. (F) Staff

246. Field Observation and Diagnosis of Urban Environment. (2) Hours of seminar/discussion and field work per week. Prerequisites: Graduate student in Environmental Design. The seminars will review the limitations and possibilities of observations for city planning. The field trips, on foot, will look at, measure, record and learn from a variety of urban environments, including physical, social and economic conditions and trends.

247. The Educative City. (1-3) Three hours of lecture/discussion per week per unit. Prerequisites: Consent of instructor. Explores the potential role of the urban physical environment in learning and development. Topics include the process of environmental learning, characteristics of educative environments, techniques for promoting environmental learning, and several case studies. See Department's posted full course description for clarification of work required for each unit value.

248. Advanced Studio: Urban Design/Environmental Planning. (4) Two hours of seminar and four hours of studio per week. Prerequisites: 208 or 240. Advanced problems in urban design and land use, and in environmental planning.

249. 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 analysis, policy formulation and alternatives generation, environmental media and presentation, design guidelines and review, environmental evaluation and impact assessment, and the like.

250. Introduction to Land Use Planning. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. This course will introduce students to the or-
organization and conduct of local land use planning as practiced in California. The course will cover the following topics: California statutes, the General Plan, CEQA, CEQA application, and how to do them, and managing a planning department.

251. Environmental Planning and Regulation. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly a portion of 298. This course examines trends in environmental planning and policy, and plans for regulatory frameworks for environmental planning encountered in the U.S. We will also relate the institutional and policy framework of the U.S. to the United Nations and emerging international institutions. The emphasis of the course will be on understanding regulations as they affect three media: air, water, and land.

252. Land Use Controls. (3) Three hours of lecture/discussion per week. An advanced course in 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. Objective is to acquaint student with a range of regulatory techniques and the legal, administrative-political equity aspects of their implementation. (F) Deakin

C253. Environmental Law and Resource Management. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Formerly Interdepartmental Studies 223. An introduction to the legal system governing the use and management of natural resources, and an overview of the major techniques that have been developed by courts, legislatures, and agencies for environmental protection. Topics will include nuisance law, constitutional constraints, environmental impact assessment, permit systems for development control, pollution control, national parks, and planning law. Also listed as Landscape Architecture C233. (F)

254. Sustainable Communities. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. This course examines the concept of sustainable development at the community level. The course has three sections: (1) an introduction to the discourse on sustainable development; (2) an exploration of several leading attempts to incorporate sustainability principles into plans, planning, and urban design; (3) an examination of European attempts to establish metropolitan patterns and urban designs for a more sustainable “green urbanism.” (SP) Deakin

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 Geographic Information Systems (GIS). The course focuses on GIS and its application to both city and regional problems in the San Francisco Bay Area and offers students a toolkit for integrating spatial information into planning solutions. The laboratory sessions will mainly employ a vector model to solving problems. Topics include problem identification, data discovery, database design, construction, modeling, and analytical measurement. Radke

258. Land Use Planning Studio. (4) Two hours of lecture and four hours of studio per week. Prerequisites: Consent of instructor. This course introduces students to the relatively new and rapidly expanding field of Geographic Information Systems (GIS). The course focuses on GIS and its application to both city and regional problems in the San Francisco Bay Area and offers students a toolkit for integrating spatial information into planning solutions. The laboratory sessions will mainly employ a vector model to solving problems. Topics include problem identification, data discovery, database design, construction, modeling, and analytical measurement. Radke

259. Seminar in Land Use Planning. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. Formerly 259. This course may not be used for unit or residence requirements for the M.C.P. degree. (F,SP)

260. Theory, History, and Practice of Community Development. (3) Three hours of lecture/discussion per week. Formerly 268. This course will explore the theory, history, methods, and practice of local community development. The course will begin by examining the historical roots of community involvement and action. It will then present alternative explanations for different paths of neighborhood and community change. Ogilvie

C261. Citizen Involvement in the City Planning Process. (3) Students will not receive credit for C261 after taking City and 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 planning and policy. 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.

265. Community Development Practicum. (2-4) Course may be repeated for credit. Three hours of seminar per week. Analysis of planner’s roles in urban community development, focusing on a diverse set of local programs, visits from practitioners, and related readings. Group projects conducted in association with innovative community-building initiatives which combine physical and social development.

266. Program Planning and Evaluation. (4) Four hours of lecture/discussion per week. Prerequisites: 202, 204B, 275 or 252, 214, 230, 220 or equivalent. Techniques and process of designing, simulating, and evaluating alternative actions to achieve objectives. Examination of broad range of methodologies in planning and evaluation. Organizational and political strategies for effective program planning. Cases drawn from social programs, municipal services, housing, and urban development at federal and local levels.

268. Community Development Studio/Workshop. (4) Two hours of lecture and four hours of studio per week. Prerequisites: 208 or 235. Formerly 258. Studio experience in analysis, policy advising, and implementation of plans in a mentorship relationship. 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.

270. Regional and Urban Development Strategies in Third World Countries. (3) Three hours of lectures per week. Prerequisites: Consent of instructor. This course examines urban development problems and policy responses in a variety of cities throughout the developing world, including housing delivery, urban infrastructure, economic productivity, and environmental quality. Policy responses of international agencies, national and local governments, and parastatal organizations will be assessed. Students will be required to write and present a case study paper.

272. Third World Urban Development Issues and Policy Options. (3) Three hours of lecture and discussion per week. Prerequisites: Consent of instructor. This course examines urban development problems and policy responses in a variety of cities throughout the developing world, including housing delivery, urban infrastructure, economic productivity, and environmental quality. Policy responses of international agencies, national and local governments, and parastatal organizations will be assessed. Students will be required to write and present a case study paper.

275. Comparative Analysis of Urban Policies. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing. Formerly 262. Description, analysis, and comparison of policies in a variety of social and spatial contexts, with references to state-planned societies. Main topics: national and local public policies in regional development, housing, transportation, urban participation, social services, and decentralized urban management. Castells

280. Doctoral Seminar. (3) Course may be repeated for credit. Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor and graduate study. Doctoral 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)

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 policy 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 theories of knowledge and links these to policy analysis, interactive planning, group processes, and emerging models of critical planning practice. Innis

282. Planning and Governing. (3) Three hours of lecture/disscussion per week. Prerequisites: Consent of instructor. Formerly Interdepartmental Studies 232. An introduction to emerging international institutions. This course links these to policy analysis, interactive planning, group processes, and emerging models of critical planning practice.

284. Advanced Topics in Planning Theory. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: 282, 221, 202 or equivalent, 252 or equivalent. Selected advanced topics in planning theory.

289. 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 and interpretation of a range of regulatory techniques, values, choice, and purposive behavior; knowledge and social action; rationales for governmental intervention in self-regulating social systems; alternative planning strategies for conditions of uncertainty in the absence of science-based knowledge. Christensen

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 on a research project in urban 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)

299. Individual Study or Research. (1-12) 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)

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 to the M.C.P. degree. (F,SP)

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Regular meeting to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Only. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examination equivalents required of candidates for the Ph.D. May not be used for unit or residence requirements for the doctoral degree. Students may earn 1-8 units of 602
Civil and Environmental Engineering
(College of Engineering)

Department Office: 760 Davis Hall #1710, (510) 642-3261
http://ce.berkeley.edu/
Chair: Adib Kanani, Ph.D.

Professors
Lisa Alvarez-Cohen, Ph.D. Stanford University. Hazardous waste treatment, groundwater contaminants, aquifer remediation
Experimential research, design of steel structures
Robert G. Bea, Ph.D. University of Western Australia. Nearshocks, offshore and coastal structures, ocean and coastal engineering, risk assessment and management
Alex Bedok, Ph.D. M.S. University of Iowa. Exploration geophysics
Jonathan D. Bray, Ph.D. University of California, Berkeley. Earthquake engineering, geotechnical engineering, numerical modeling, geo-environmental engineering
Anil K. Chopra, Horace, Dorothy and Katherine Johnson Professor of Civil Engineering, Ph.D. University of California, Berkeley. Dynamics of structures, earthquake engineering
Georg A. Cooper, Ph.D. University of Cambridge. Petroleum engineering
Carlos Daghrir, John H. Horngiiff Professor of Civil Engineering, Ph.D. University of Michigan. Transportation theory, mathematical analysis
Amen Der Kiureghian, David Tuant Professor of Civil Engineering, Ph.D. University of Illinois. Reinforced concrete structures, fracture and earthquake engineering
John A. Dracup, Ph.D. University of California, Berkeley. Water resource systems, surface water hydrology, hydroclimatology
Gregory L. Fernves (T.Y. and Margaret Lin Professor of Engineering), Ph.D. University of California, Berkeley. Structural dynamics
Gil C. Figueiredo, Chair, Research and Technical Support, Ph.D. University of California, Berkeley. Analysis, design of concrete structures
Mogata A. Foa, Sdc. Massachusetts Institute of Technology, Coastal and offshore engineering
Alexander J. Horne, Ph.D. University of Dundee, Scotland. Ecology of aquatic systems
James R. Hwang, Ph.D. Chair, Undergraduate Affairs; Lawrence E. Peirano Professor of Civil and Environmental Engineering Emeritus, Ph.D. University of Durham, England. Water, wastewater chemistery, water treatment engineering
Adil Kanani (Chair and Edward G. and John R. Cahill Professor of Civil Engineering), Ph.D. University of California, Berkeley. Project and construction management, management of technology
James M. Kelly, Ph.D. Stanford University. Structural mechanics
Stein A. Mahn (Byron L. and Elvina E. Nickash Professor of Structural Engineering), Ph.D. University of California, Berkeley. Structural behavior, earthquake engineering
Jack P. Moran, Vice Chair, Exploration, University Research Center and Roy W. Carlson Distguished Professor of Civil Engineering 1991-1998, Ph.D. University of Illinois. Reinforced concrete structures
Carl L. Mongrath (Robert Horner Professor of Civil and Environmental Engineering Emeritus), M.S. University of California, Berkeley. Transportation engineering, pavement design, pavement materials
Paulo J. Monteiro (Roy W. Carlson Distguished Professor of Civil Engineering Emeritus), Ph.D. University of California, Berkeley. Concrete behavior, structural materials
H. Frank Morrison (P. Malcolm Professor of Mineral Engineering), Ph.D. University of California, Berkeley. Exploration geophysics
William W. Nazaroff, Roy W. Carlson Distinguished Professor of Civil Engineering, Ph.D. California Institute of Technology. Air quality engineering
Yoram Ruchi, Ph.D. University of Haifa, Israel. Groundwater hydrology, stochastic processes, contaminant transport, geostatistics
Raymond B. Seed, Ph.D. University of California, Berkeley. Geotechnical engineering, earthquake engineering, soil mechanics
Nicholas Sitar (Vice Chair, Graduate Affairs and Chancellor's Professor Emeritus), Ph.D. Stanford University. Geotechnical and geological engineering, environmental geotechnics
Rodeney J. Sobey, Ph.D. Imperial College, London. Coastal, estuarine, and river hydraulic engineering
Garson Sposito, Ph.D. University of California, Berkeley. Soil biology
Robert L. Taylor (T.Y. and Margaret Lin Professor of Engineering Emeritus), Ph.D. University of California, Berkeley. Mechanics of solids, computational mechanics
Kent S. Udell, Ph.D. University of Utah. Environmental restoration processes
Martin Wachs (Director, Institute of Transportation Studies), Ph.D. Northwestern University. Urban transportation planning, transportation economics and finance
William C. Webster (Vice Provost, Academic Planning and Facilities, and Chadlii Professor Emeritus), Ph.D. University of California, Berkeley. Nonlinear coupled motions of offshore structures, operations research, shallow-water wave modeling
R. Brady Williamson, Ph.D. Harvard University. Fire research, materials engineering
James M. Anderson, Ph.D. (Emeritus)
Vitelmro Berters, Sc.D. (Emeritus) L. Macdonald Distguished Professor of Civil Engineering Emeritus and Byron L. and Elvira E. Nickash Professor of Structural Engineering Emeritus
Bruce A. Bolt, Ph.D. (Emeritus)
Jack G. Bouwaksh (Emeritus)
Tar L. Brekke, Dr. Ing. (Emeritus)
Ray W. Clough, Jr., Ph.D. Roy W. Carlson Distguished Professor of Civil Engineering Emeritus
Raymond B. Seed, Ph.D. (Emeritus)
David L. Sedlak, Ph.D. University of Wisconsin at Madison. Environmental engineering. The B.S. program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012. (410) 345-7700.

Program Overview
The objective of the civil engineering program at Berkeley is to provide the needed background for students who wish to pursue engineering as a profession or for students who wish to engage in teaching and research. The program is based on the concept that civil and environmental engineers must be well grounded in the sciences, broadly educated in humanistic and social studies, cognizant of economic factors, skilled in communicating technical ideas, and knowledgeable about the broad principles that underlie the practice of the profession.

The four-year undergraduate curriculum leading to the B.S. degree provides an education that is sufficiently comprehensive for students who wish to embark on a professional career directly after graduation and keep abreast of new developments in civil and environmental 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 is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012. (410) 345-7700.

Students may receive a bachelor's degree at the end of four years and a master's degree at the end of five years, provided they have been accepted for graduate study.

In addition, the department now offers a minor in structural engineering, designed particularly for students in the Department of Architecture, but also available to any student who has met the prerequisites and who is enrolled in a non-civil engineering program. For details, contact the Civil and Environmental Engineering Academic Affairs Office, 750 Davis Hall.

Civil and environmental engineering includes the following major areas of professional specialization:

Construction engineering and management deals with planning and executing construction projects. It is concerned with the fundamental principles that underlie planning, organizing, financing, managing, and operating construction projects and with estimating the probable performance of construction organizations under specific conditions.

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, geotechnical engineering, hydrology, and water resources management, and environmental fluid mechanics.

Geotechnical engineering 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, geotechnical aspects of environmental engineering, and highway materials engineering.

Engineering geosciences complements the conventional coverages within geotechnical engineering but adds geophysics, reservoir modeling, and petroleum engineering. Geophysics encompasses a broad range of non-intrusive remote sensing and imaging methods, at
scales from microns to kilometers, with broad applications and essentially all major areas of civil engineering.

Structural engineering is concerned with the analysis and design of all types of structures, including earthquake-resistant design. Some structures, such as bridges, dams, office buildings, power plants, and harbors, are directly within the field of civil engineering. Other structures, such as aircraft, ships, space vehicles, missiles, and radio telescopes, are in related fields.

Structural mechanics parallels structural engineering for the most part, but strengthens the scientific background of the student. The field employs the principles 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 material properties.

Structural materials engineering is concerned with the development of adequate construction materials for engineering projects. Primary emphasis is given to the understanding of basic material properties such as mechanical and thermal response, microstructure behavior and durability. Structural materials include steel, concrete, aluminum alloys, timber, plastic, and composite materials.

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, logistics systems and their terminals.

Curriculum for the Bachelor's Degree

The undergraduate curriculum provides a broad general education in civil and environmental engineering. The curriculum requires a total of 120 units. The programs of study are described in detail in the Announcement of the College of Engineering (available without charge from the College of Engineering, University of California, Berkeley; Berkeley, CA 94720-7102).

All students must complete six courses of at least 3 units each in humanities and social studies selected from an approved list of courses (please see the "Humanities and Social Studies" section of this catalog). Must be taken on a passing basis. A course degree may be removed in Engineering 45 with a minimum grade point average of 3.3 required. Freshman or sophomore standing and consent of instructor.

Upper Division Courses

100. Elementary Fluid Mechanics. (4) Three hours of lecture and one hour of recitation per week, plus individual laboratory experiments. Prerequisites: En- gineering Mechanics 77N, Scientific and En- gineering Problem Solving Using Computers; 101, Fractals, Chaos, and Complexity around us. (SP) Foda, Robin, Stacey

102. Geophysical Fluid Mechanics. (3) Three hours of lecture per week. Prerequisites: One of 100, Chem- ical Engineering 150A, Mechanical Engineering 106, or equivalent. The oceans and the atmosphere, thermodynamic equilibrium, static equilibrium, potential temperature, kinematics of the environment, acceleration on a rotating earth, wind and current with weak acceleration, the Ekman layer in the ocean, atmospheric boundary layer, fronts, sea ice, geophysical applications. (SP) Foda


104N. Design of Environmental and Water Resource Systems. (3) Students will receive no credit for 104 if taken before Fall 1998. Two hours of lecture and three hours of laboratory per week, plus field trips. Prerequisites: 100 and 111, senior standing in engi- neering or science. Formerly 104. Design emphasis in hydrology and hydraulics. Students will choose three design projects from a range of water resource and environmental topics including water theme parks, ornamental fountains, hydroelectric generation facilities, water supply systems, flash flood warning systems, stream and wetland restoration, and control of pollu- tants in urban stormwater runoff. (F) Dracup

108. Air Pollutant Emissions and Control. (3) Three hours of lecture per week. Prerequisites: 111 or con- sent 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 compres- sion-ignition engines. (SP) Harvey

109. Indoor Air Quality. (3) Three hours of lecture per week. Prerequisites: 111 or consent of instructor. Study of air pollutants in indoor environments such as private residences, offices, schools, and commercial and public buildings. Overview of the factors that govern indoor pollutant concentrations. Building ventilation principles and practice. Detailed exploration of character- istics and control of several pollutant classes, such as radon and its decay products, volatile organic compounds, and combustion byproducts. Elements of a control strategy. (F) Nazaroff

110. Water Pollution Control and Treatment. (3) Three hours of lecture per week. Prerequisites: 100, 111, or consent of instructor. The course covers ma- jor processes and unit operations used for treatment of water and for water pollution control and treatment. Fundamen- tals of treatment processes and engineering applications of physical, chemical, and biological processes (like sedimentation, filtration, coagulation, flocculation, adsorption, mem-
branes, aerobic, and anaerobic biological processes) are discussed. The focus of the course is on the technical analysis of the processes with some design components. (F) Hercmanowicz.

111. 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 management 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-fueled power plant. Lectures will address process design, economic and institutional constraints on design, and project management. (F) Hercmanowicz.


120. Structural Engineering. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 68 (may be taken concurrently). 130. Introduction to design and analysis of structural systems. Loads and load combinations. In-depth analysis and design of members in steel, reinforced concrete, and timber. Structural analysis theory. Hand and computer analysis methods. Validation of results from computer analysis. Applications, including bridges, building frames, and long-span cable structures. (F,SP) Mohede, Fvenes.


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 Resistance Factor Design (LRFD) methods: tension members, compression members, beams and beam-columns; typical shear and moment connections, welded and bolted. Behavior and characteristics of steel structural systems. A term project is assigned to conduct the design of a steel building structure, including resistance to earthquake loads. Laboratory includes problem-solving sessions and actual testing of steel components. (F,SP) Astanen.

123. Design of Reinforced Concrete Structures. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 120. Introduction to materials and methods of reinforced concrete construction; behavior and design of reinforced concrete beams and one-way slabs considering deflections, flexure, shear and anchorage; behavior and design of columns including slenderess effects; design of spread footings; design of lateral load resisting frames and walls for earthquake effects. Laboratory includes experiments and design decisions leading to the design of small-scale structures. Laboratory project involving 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. Characteristics and properties of wood as a structural material; design and analysis of structural effects of 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) Mahin, Filipou.

125. Structural Dynamics and Earthquake Engineering. (3) Three hours of lecture per week. Prerequisites: 122 or 123 (may be taken concurrently) and 121. Theory and application of structural dynamics for single and multiple degrees-of-freedom systems subjected to earthquake ground motion. Characteristics of earthquake ground motion and design spectra. Concepts of overall seismic design of buildings, load paths, and proportioning and detail of members to achieve satisfactory seismic response. (SP) Chopra, Mahin.

130. Mechanics of Materials I. (3) Three hours of lecture per week. Prerequisites: 60 or Engineering 45 and Engineering 36. Introduction to the mechanics of deformable solids; elastic and ultimate resistance of materials; stress and deformation analysis for bars, shafts, beams, and columns; combined stresses; energy methods; statically indeterminate systems; elastic stability and buckling. (F,SP) Govindjee, Armero, Li.


140. Failure Mechanisms in Civil Engineering Materials. (3) Three hours of lecture per week. Prerequisites: 60. The failure mechanisms in civil engineering materials (cement-based and polymer-based materials) are associated with processing, microstructure, stress states, and environmental changes. Fracture mechanics of brittle, quasi-brittle, and ductile materials; cracking processes in monolithic, particulate, and fiber reinforced materials; examples of ductile/brittle failure transitions in civil engineering structures; retrofitting of existing structures; non-destructive techniques for damage detection. (SP) Ostertag.

150. Transportation Engineering. (3) Two hours of lecture and three hours of laboratory per week. Operation, management, design, and evaluation of transportation systems including streets and highways, transit, rail, and water systems. Traffic engineering fundamentals; accident analysis; transportation planning. Operations analysis methods: time-space diagrams, queueing theory. Economic and environmental impact analyses of transportation effects: air pollution, noise. Design of safety and efficiency: horizontal and vertical alignment, earthwork, pavements. Laboratory project: redesign of a simple freeway interchange to allow carpooling and ramp-metering; evaluation of reduced congestion and environmental effects. (SP) Cassidy, Daganzo, Madanat.

151. Transportation Planning and Implementation. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Statistics 25 and Engineering 77N. Planning and investment decisions. Development of urban facilities; transportation planning. State planning and needs and cost allocation studies. Rail, water, and air transportation planning. Forecasting and new technology. (F) Hansen, Kanafani.

153. Transportation Facility Design. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 150 or 151, Engineering 28. Geometric design of transportation facilities based on operational capacity, site constraints, and safety considerations. Pavement design and rehabilitation. Emphasis on airports, including land and air-side features. (SP) Cassidy, Chira-Chavala, Harvey, Madanat, Skabardonis.
165. Concrete Materials and Construction. (3) Three hours of lecture per week. Prerequisites: 60. Consideration of the broad aspects of use of concrete in the civil and environmental engineering curriculum 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 evaluation methods, field trip to construction sites. Group and individual projects on concrete construction. (SP) Monteiro

166. Construction Engineering. (3) Two hours of lecture and three hours of laboratory or fieldtrip per week. Prerequisites: Upper division standing. 167 recommended. Introduction to construction engineering and field operations. The construction industry, construction methods and practice, productivity improvement, project management, site layout formation, specification of steel and concrete structures. Labs demonstrate the concepts covered. Field trips to local construction 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: Upper division standing. Principles of economics, decision making, and law applied to company and project management. Business ownership, liability and insurance, cash flow analysis, and financial management. Project life-cycle, design-construction interface, contracts, estimating, scheduling, cost control. (F,SP) Lobs, Tommelein

168. Fire Protection Engineering. (3) Three hours of lecture per week. Prerequisites: 60. Formerly 168N. Introduction to fire protection engineering, providing the framework for solving fire problems. Model building codes, with emphasis on fire safety provisions. Relationshio of fire protection engineering, identification and evaluation of plastics and polymers for fire safe usage. (F) Williamson

169A. Web-Based Systems for Engineering and Management. (1) Three hours of lecture for five weeks. Prerequisites: 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, emphasizing 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. Web design, use, and programming in engineering and management research and practice. The course is a combination of lectures, readings, hands-on exercises, homework assignments, and a project. The project is an opportunity for students to apply a course module or applications to their own interests. (F) Horvath, Tommelein

169B. Database Systems for Engineering and Management. (1) One and one-half hours of lecture for ten weeks. 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, emphasizing 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. Theory, design, and applications of databases and database management systems in engineering and management research and practice. Programming in SOL; 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 design and implement a database application suitable to their own interests. (F) Horvath

169C. Visualization and Simulation for Engineering and Management. (1) One and one-half hours of lecture for ten weeks. 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 research and practice. Programming in SOL; 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 design and implement a database application suitable to their own interests. (F) Horvath

170. Geotechnical and Geoenvironmental Engineering. (3) Two hours of lecture and three hours of discussion/laboratory per week. Prerequisites: Upper division standing in engineering or science. 100 recommended. Introduction to principles of groundwater flow, including steady and transient flow through porous media, numerical analysis, pumping tests, groundwater contamination transport, and design of waste containment systems. (F,SP) Rubin, Sitar

175. Geotechnical and Geoenvironmental Engineering. (3) Three hours of lecture and three hours of discussion/laboratory demonstration period per week. Prerequisites: 70, 100, 130 (one of which may be taken concurrently). Soil formation and identification. Engineering properties of soils. Fundamental aspects of soils, including soil mineralogy, soil-water movement, effective stress on grains, 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. Waste Containment Systems. (3) Three hours of lecture per week. Prerequisites: 111 and 175 are recommended. Waste generation and disposal, types and characteristics of hazardous and toxic waste; generation of contaminants in soil; soil-water-contaminant interactions; engineering soil properties; use of earth and geosynthetic materials in waste containment applications; principles, design, and construction of linear and leachate collection systems; application to landfill design. (SP) Pestana

177. Foundation Engineering Design. (3) Three hours of lecture per week. Prerequisites: 120 and 175 or consent of instructor. Principles of foundation engineering. Fundamentals of statics and dynamics related to design of retaining structures, shallow foundations, deep foundations, and slope stability. The course has a design project that addresses each of the major topics areas in an integrated fashion. (SP) Bray, Sree


179N. Pavement Engineering. (3) Two hours of lecture and three hours of laboratory per week. A first course in pavement engineering for highways and airfields, including failure mechanisms, design approaches, new pavement design, effects of materials and construction on pavement performance. Emphasis on understanding of fundamental issues of pavement engineering, approaches to evaluation and design for new pavements and maintenance and rehabilitation design, practical lab experience with asphalt concrete materials and tools used for evaluation and design of pavements, understanding of construction issues, and effects on pavement performance. (F) Harvey

180. Construction, Maintenance, and Design of Engineered Systems. (4) Three hours of lecture and one hour of team project discussion per week. Prerequisites: 120, 167, and 175 or consent of instructor. Procedures, equipment, and techniques to construct, maintain, and design steel and concrete structures and foundations. Management and quality assurance and control of these activities. Class team projects address design, construction, and maintenance of temporary civil and environmental engineered systems. Teams identify and are aided by experienced engineers and consultants. Teams construct a physical model of the system or component system. Teams develop a formal report on their project and present project results to a panel of judges at the end of the semester. (SP) Bea

184. Surveying and Engineering Measurements. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Mathematics 53, 54, 7A, 7B, 80; Standards, units, calibration; measurement of distance, elevation, angles; systematic and random error analysis; adjustment of measurements; weighing; principles of least squares; directions; traversing; horizontal and vertical curves; and Global Positioning Systems (GPS). (F) Staff

192. The Art and Science of Civil and Environmental Engineering Practice. (1) One hour of lecture per week. Prerequisites: Math 53, 54, 7A, 7B, 80; CS 17; 120A; C145, 145L, Earth and Planetary Sciences C145, 145L, Earth and Planetary Sciences C145, 145L. A seminar oriented towards broad professional skills in addition to technical engineering skills. Students discuss professional engineering issues using civil and environmental engineering experience. The course focuses on management of projects, teamwork, organization, management of time and resources, time management, project management, and ethical considerations. The course attempts to create an environment where the students use the tools of their disciplines to produce unified and efficient systems. (SP) Iyer

193. Engineering Risk Analysis. (3) Three hours of lecture per week. Prerequisites: Upper division standing. Applications of probability, statistics in planning, analysis, and design of civil engineering systems. Development of probabilistic models for risk and reliability evaluation. Occurrence models; extreme value distributions. Analysis of uncertainties. Introduction to Bayesian statistical decision theory and its application in engineering decision-making. (F) Der Kiureghian

196. 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: Senior standing in Engineering and completion 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 four units per semester. 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 major adviser. Supervised independent study. (F,SP) Staff

Graduate Courses

200A. Environmental Fluid Mechanics. (3) Students will receive no credit for 200A for taking 105 before...
205A. Coastal Processes. (3) Three hours of lecture per week. Breakers and surf, breakwaters, surf-zone dynamics, coastal sediment transport, shore protection measures, submarine pipelines. Offered odd-numbered years. (F) Foda

205B. Load Engineering. (3) Three hours of lecture per week. Prerequisites: 125, 193 or equivalents and senior design experience. Processes and procedures to determine loadings to design or reanalysis structure and foundation systems, including bridges, buildings, transportation, harbor, coastal, and offshore structures. Sources of loadings, load processes, loading effects. Reliability, probability, economic, and social considerations. Operational computer models and environmental loading including those due to wind, current and wave, ground movements, ice, snow, explosions, and fires. (F) Bea

206. Water Resources System Analysis. (3) Three hours of lecture per week. Prerequisites: 103 or consent of instructor. This course addresses fundamental and practical issues of system analysis in water resources planning and management. Quantitative overview of system analysis methods and their application in water resources and environmental engineering will be presented. Topics include systems analysis methods applied to river basin modeling, water management and planning. Case studies of expansion modeling, reservoir operations, water allocations, reservoir storage-yield modeling, rainfall-runoff hydrologic modeling, streamflow simulations, and forecasting. (SP)

207. Sediment Transport Mechanics. (3) Three hours of lecture per week. Prerequisites: 102 or consent of instructor. Sediment transport in rivers, estuaries, and closed conduits. Measurement techniques, modeling of river systems, river mechanics. (SP)

210N. Restoration of Aquatic Ecosystems. (2) Three hours of lecture/seminar per week. Prerequisites: 111, 118 or equivalents and consent of instructor. Interdisciplinary course for students who intend to carry out research on damaged ecosystems, supervise actual restorations or enhancement, and also students who are simply interested in this field. The course format is an overview of system analysis methods and their application in water resources and environmental engineering. (SP) Sobey

210. Water Treatment Engineering. (3) Three hours of lecture per week. Prerequisites: 111 and 115 (both may be taken concurrently). Water quality requirements for beneficial uses, standards, and regulations. Concepts of mass balance and chemical reactor theory applied to water quality improvement. Specific topics include gas transfer, particulate removal processes, chemical precipitation, ion exchange, adsorption, and disinfection. (F) Hunt

212. Wastewater Treatment Engineering II. (3) Three hours of lecture per week. Prerequisites: 111 and 115. Wastewater discharge and receiving water standards. Primary, secondary and tertiary wastewater treatment and sludge treatment and disposal fundamentals and design including primary treatment, microbial kinetics of biological processes, activated sludge, fixed film reactors, anaerobic digestion, and nutrient removal. (SP) Hermanowicz

213N. Research Methods and Ethics in Ecology and Environmental Engineering. (2) Two hours of lectures per week. Prerequisites: 105 and six hours of fieldwork per week for five weeks. Prerequisites: Introductory statistics course recommended. Experimental design of field and laboratory enclosures, closures, emphasizing aquatic ecosystems with use of two or more examples where students will form groups and individual exercises at local streams, wetlands, lakes, and the estuarine intertidal zone. Scientific ethics: fraud, falsification, and plagiarism. The role of professional judgment. Data presentation, publications, authorship. Offered even-numbered years. (SP) Home

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 quantify trace elements, organic pollutants, smog-forming gases, and nutrients in the environment. Students will use modern analytical techniques to quantify pollutants in a variety of environments, soils, and waters. Offered even-numbered years. (SP) Home

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 treatment. Lectures and laboratories on tracers, filtration, aeration, ion exchange, chemical treatment of wastewater, biological treatment, activated sludge, and anaerobic digestion. (SP) Alvarez-Cohen

216. Hazardous and Industrial Waste Treatment. (3) Three hours of lecture per week. Prerequisites: 211 and 212 (taken concurrently). Sources and characteristics of hazardous and industrial wastes in the context of current regulations. Theory and design of commonly used and highly innovative treatment technologies applicable to a range of specific hazardous and industrial wastes. State-of-the-art approaches to remediation of hazardous waste sites and groundwater contamination. (SP) Hermanowicz

217. Environmental Chemical Kinetics. (3) Three hours of lecture per week. 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 intermediate transport and pollutant transformation by abiotic, photochemical, and biological reactions. Techniques for the estimation of environmental reaction rates. Development of models of pollutant behavior in complex natural systems. (SP) Sobey

218A. Air Quality Engineering. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering or consent of instructor. Quantitative overview of the characterization and control of air pollution problems. Summary of fundamental chemical and physical processes governing pollutant behavior. Analysis of key elements of the air pollution system: sources and control techniques, atmospheric transformation, atmospheric transport, modeling, and air quality management. (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, with application to understanding fate of pollutants, control device performance, and measurement systems. Particle and gas deposition. Light scattering and visibility impairment. Particle-gas interactions. Issues in monitoring and experimentation. Offered odd-numbered years. (SP) Nazaroff

197. Contaminant Transport Processes. (3) Three hours of lecture per week. Prerequisites: 100 and 111 (173 recommended). The fate of contaminants in the environment may be described by transport processes within a single media and between media. The similarities in contaminant dispersion within air, surface water, and groundwater will be emphasized. Interphase transport processes such as adsorption and desorption will then be considered from an equilibrium perspective followed by the kinetics of mass transfer across environmental interfaces. (SP) Hunt


225. Dynamics of Structures. (3) Three hours of lecture per week. Prerequisites: 220 (may be taken concurrently) or equivalent. Evaluation of deformations and forces in structures, idealized as single-degree-of-freedom or discrete-parameter multi-degree of freedom systems, due to dynamic forces. Evaluation of earthquake excitations and forces in structures by linear response history analysis; estimation of maximum response by response spectrum analysis; effects of inelastic behavior. Laboratory demonstrations. (F) Chant, Fenves


229. Structural Reliability. (3) Three hours of lecture per week. Introduction to probability theory. Formulation of reliability for structural components and systems. Exact and approximate second-order reliability methods, simulation methods. Analysis of model uncertainty and Bayesian reliability methods. Stochastic load models and load combinations. Bases for probabilistic design and finite element reliability methods. (SP) Der Kiureghian

231. Mechanics of Solids. (3) Students will receive no credit for 231 after taking 231A or 231B prior to Fall 1992. Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Mechanical response in tension in elastic, plastic and viscoelastic materials. Continuum mechanics. The stress and strain tensors, equilibrium, compatibility. Three-dimensional elastic, plastic and viscoelastic problems. Thermal, transformation, and devolving stress in Application. 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: 220 or consent of instructor. The goal of this course is to study the theories of structural mechanics within the framework of non-linear continuum mechanics of solids. Finite elasticity. Invariance. Energy principles: principles of virtual work and virtual power. Transient and mixed variational principles. Theory of stability: Euler method; stability under follower loads. Classical theories of beams: planar, torsional, and lateral buckling. Plate theories. Invariant theorems: Hamiltonian theorems: variational calculus; Cossarini prints of rods. (SP) Amoré


234. Computational Inelasticity. (3) Three hours of lecture per week. Prerequisites: 231 or Materials Science and Engineering C211 or Mechanical Engineering 185. Computational inelastic deformation of solids; 1, 2, and 3-D large and small-deformation continuum plasticity and viscoelasticity models and their algorithmic approximations; viscoplastic regularization of materials; thermodynamics and its relationship to algorithmic stability; return mappings; closest-point projections and operator splits; application to metals, soils, concrete, and polymers and incorporating into finite element codes. Offered odd-numbered years. (F) Armero, Govindjee

C236. Microstructured Materials. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Thermomechanical behavior of inhomogeneous materials (polycrystals, composites, porous and damaged media) and transformation behavior. Composite materials theory for concrete. Viscoelasticity; fracture mechanics; thermal behavior and durability of concrete. Use of instrumentation, data acquisition, and modern experimental techniques employed in concrete research. (SP) Monteiro

241. Reinforced Concrete. (3) Three hours of lecture per week. Prerequisites: 123. Analysis and design of reinforced concrete beams and columns for flexure, shear, axial load, torsion, and anchorage; behavior and design of two-way slabs using the direct design method, equivalent frame method, and strip method; behavior and design of reinforced concrete frame and frame-wall structures for gravity and lateral loads. (F) Moehle, Filipou

245. Behavior of Reinforced Concrete. (3) Three hours of lecture per week. Prerequisites: 220 and 225. Advanced topics in reinforced concrete construction, including inelastic flexural behavior; applications of plastic analysis to reinforced concrete frames; behavior in shear and torsion; yield-line analysis of slabs; behavior under cyclic and reversed loading; seismic rehabilitation. Offered even-numbered years. (SP) Moehle, Filipou

246. Prestressed Concrete Structures. (3) Three hours of lecture per week. Prerequisites: 224 or consent of instructor. Behavior and design of prestressed concrete structures. Moment transfer to tendons and the development of prestress in structures. Analysis of prestressing losses. Bending moment and shear in prestressed concrete structures. Advanced computer-aided design procedures. Behavior under cyclic and reversed loading; seismic rehabilitation. Offered every year. (SP) Moehle, Filipou

247. Design of Steel and Composite Structures. (3) Three hours of lecture per week. Prerequisites: 122 or equivalent. Behavior and design of steel plate girders and shear walls. Design of bracings for stability. Design of members subjected to torsion. Design of composite beams, columns, and shear connectors. Design of 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 systems. (SP) Astanine, Mahin

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 structures. Behavior of hysteresis in members subjected to bending moment, shear, and their combinations. Collapse mechanisms of steel members and systems such as moment frames and braced systems. Inelastic cyclic behavior of steel components. Introduction to fracture and fatigue of steel components. Offered even-numbered years. (F) Astanine, Mahin

250. Transportation Policy, Planning, and Development. (2) Two hours of lecture per week. Public policy-making process with specific application to transportation. Uses of technical information in public policy making. Case studies of current issues in transportation planning and policy making. (SP) Wachs

C250N. Transportation Policy and Planning. (3) Three hours of lecture/discussion per week. Prerequisites: C290U, City Planning C213, or consent of instructor. Formerly C290W. 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; special needs and issues surrounding construction project evaluation and financing. Principles of financial management and project feasibility focus on project risk assessment and life-cycle costing. Innovative financing approaches are defined and demonstrated by use of example applications. Significant, current issues related to major pro-

251. Operation of Transportation Facilities. (2) Two hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Route, network, and bottleneck analysis; and strategies for freeway and tollways; queueing; technology. Planning, implementation, and operation of control technologies. (F) Cassidy, Daganzo

252. Systems Analysis in Transportation. (2) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. The system approach and its application to transportation engineering and planning. The transportation system as a production system. Production optimization and cost analysis. Economic characteristics of selected transportation technologies. Systems analysis techniques including optimization, evaluation, and systems modeling. (F) Hansen, Kanafani

253. Intelligent Transportation Systems. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Consent of instructor. The theory and implementation of advanced surveillance, navigation, communication, and computer technology to monitor, analyze, and 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. Students carry out a term project under the supervision of an ITS researcher. (F) Hansen, Skabardonis

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. Relevant methodologies. (3) Hansen

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 special needs and issues surrounding construction project evaluation and financing. Principles of financial management and project feasibility focus on project risk assessment and life-cycle costing. Innovative financing approaches are defined and demonstrated by use of example applications. Significant, current issues related to major pro-

256. Logistics. (3) Students will receive no credit for 258 after taking 264C prior to Fall 1997. Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly 264C. Vehicle routing. Transportation-inventory-production interrelationships, physical distribution networks, many-to-many networks (airlines, postal, etc.), the role of transshipments and terminals in logistic systems for the transportation of goods and passengers, public and private transportation system design. Relevant methodologies. (F) Daganzo

259. Public Transportation Systems. (2) Two hours of lecture per week. Prerequisites: 250, 251, 252, or consent of instructor. Analysis and evaluation of mass transit systems, their operation and management. Technology of transit vehicles and structures. Impact on urban land use. Public policy and financing. (SP) Hansen

260. Air Transportation. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Nature of civil aviation; structure of the air industry; aircraft characteristics and performance; aircraft noise; navigation and air traffic control; airport planning and design; economics, and management of aviation system planning. (F) Hansen, Kanafani

260L. Air Transportation Planning. (1) Three hours of studio per week. Prerequisites: 260 (may be taken concurrently). Studio course in air transportation planning. Problems in airport planning and design; airline planning; aviation systems planning. (SP) Hansen, Kanafani

261. Transportation Infrastructure Management. (3) Three hours of lecture per week. Prerequisites: 252 or consent of instructor. Integrated treatment of analytical methods and technologies for the management of transportation facilities. Field condition surveys, sampling and inspection considerations. Performance models development and application. Agency costs and user impacts. Maintenance, rehabilitation, and replacement decisions. Facility-level and network-level infrastructure management. Overview of existing pavement, bridge and rail management systems. Term paper required. (SP) Madanat

262. Analysis of Transportation Data. (2) Two hours lecture per week. Prerequisites: 134 or equivalent. Consent of instructor. The use of field data in transportation. Data gathering techniques, sources of errors, considerations of sample size. Experiment design. Descriptive and inferential statistical operations analyses. Analysis techniques. (SP) Daganzo

263. Operations of Transportation Terminals. (3) Three hours of session per week. Prerequisites: Graduate standing or consent of instructor. Characteristics of terminals on a mode by mode basis (sea ports, rail-yards, airports, parking lots, etc.). Methodologies used to study terminal operations and the management of congestion. (Chronographs, input-output diagrams, pricing, simulation). Studies illustrating the use of the methodologies for different modes. (SP) Daganzo

264. Transportation Network Flows. (2) Students will be responsible for taking 264A and no credit after taking 264A-264B. Two hours of lecture per week. Prerequisites: 251, 252 or consent of instructor. Formerly 264A-264B. Mathematical characterization of networks, metrics, shortest paths, continuum approximations. Flows on networks, traffic assignment, hierarchy structure of highway networks. (F) Newell

265. Pavement Design and Rehabilitation. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering or consent of instructor. Principles and practice of pavement design, structural, and functional condition evaluation for highways, airfields, streets, and port facilities, including new facilities, rehabilitation, and reconstruction. Emphasis on mechanistic-empirical procedures, including materials, climate, and traffic characterization, pavement damage mechanisms, and use of current design methods. Concrete and asphalt concrete surfaced pavements are covered. Offered alternate years. (SP) Harvey, Monismith

266B. Marketing and Management of International Construction and Engineering. (3) Three hours of lecture per week plus individual meetings with students. Prerequisites: Graduate standing in Engineering, Architecture, or Business School. Application of techniques to development by engineers and contractors with emphasis on the international market. Development of skills in communications, contracts and negotiations. Management of international projects, including planning, procurement, logistics, personnel and financing. Special problems of adverse environments. (SP) Gerwick

267B. Advanced Concrete Construction. (3) Utilization of concrete for construction; lightweight, high-strength, and architectural concrete. Uses of admixtures and processes for resolving problems associated with field processing of concrete. Application to build-ings, bridges, pressure vessels, and pollution control structures. Staff

267F. High-Tech Building and Industrial Construction. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Introduction to technologies including computer-aided design, electrical systems that define functionality and affect life-cycle costs of facilities. Focus on “smart” buildings and “high-tech” industrial projects. Describe terminology, engineering design characteristics, components, and materials. Perform design calculations. Stress construction and installation methods. Discuss contractual relationships and coordination requirements between owners, design firms, and general as well as specialty contractors. (F) Tommelein

268B. Project Proposal Preparation and Presentation. (1) Two hours of lecture every other week. Prerequisites: Graduate standing or consent of instructor. This course provides an overview of the preparation and presentation of construction project bids and proposals. Topics include the project award process, bid packages, quantity take-offs, estimating, scheduling, and project presentation. The emphasis is on practical applications. Students will participate in a realistic bidding exercise. No final examination. (F) Staff

268E. Civil Systems and the Environment. (3) Three hours of lecture per week. Prerequisites: 166 or 167 or equivalent. Methods and tools for economic and environmental analysis of civil engineering systems. Focus on construction, transportation, and operation, and maintenance of the built infrastructure. Life-cycle planning, design, costing, financing, and environmental assessment. Industrial ecology. Focus on environmental, pollution prevention, external costs. Models and software tools for life-cycle economic and environmental inventory, impact, and improvement analysis of civil engineering systems. (SP) Horvath

268F. Risk Assessment and Management of Technology. (3) Three hours of lecture per week. Provide students with a broad-based understanding of primary principles, considerations, and multidisciplinary approaches to assessing and managing risks associated with technology. Techniques will be employed to provide objects and processes necessary for human sustenance, productivity, entertainment, health, and comfort. Quantitative and qualitative risk analyses and management strategies employed in proactive, reactive, and interactive modes will be addressed. (SP) Bea, Roberts

268G. Project Evaluation and Financing. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. This course emphasizes concepts and issues surrounding construction project evaluation and financing. Principles of financial management and project feasibility focus on project risk assessment and life-cycle costing. Innovative financing approaches are defined and demonstrated by use of example applications. Significant, current issues related to major pro-
268H. Advanced Project Planning and Control. (3) Three hours of lecture per week. Prerequisites: 167. Cost and time estimating and controlling techniques for projects, teamwork, material, labor, information, and subcontract resources, scheduling techniques, earned value concepts. Measuring project percent complete. Contractual risk analysis. Project investment analysis.

268L. 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 that are covered include the entrepreneurial process, organizing and staffing, establishing and applying production control systems; means of protecting products and services from competitive threat; and financial management. (SP) ILLU

269. Asphalt Paving Mixtures. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Advanced course concerned with asphalt paving especially for highway and airport pavements; emphasis on physical properties of asphalts, aggregates, their combinations, and the relationship of these properties to design, construction, and rehabilitation of pavements; construction methodologies; cyclic, and energy considerations. (SP) Harvey, Mornsmith

270A. Advanced Soil Mechanics. (3) Three hours of lecture per week. Prerequisites: 175 or equivalent. Advanced treatment of topics in soil mechanics, including state of stress, consolidation and settlement analysis, shear strength of cohesionless and cohesive soils, and slope stability analysis. (F) Bray, Seed

270B. Advanced Foundation Engineering. (3) Three hours of lecture per week. Prerequisites: 270A or consent of instructor. Advanced treatment of topics in foundation engineering, 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) Bray, Pestana

270L. Advanced Soil Mechanics Laboratory. (3) One and one-half hours of lecture and three hours of laboratory per week. Prerequisites: 270A, 270B (concurrently), or consent of instructor. Lectures and experimental studies of advanced aspects of soil property measurement and analysis and interpretation to foundation design. Consolidation testing by load control and Janbu’s method, static and cyclic triaxial and simple shear testing under stress-strain control with pore pressure measurement; seepage testing. Emphasis on selection and simple handling, in-situ field testing, and related topics including advanced instrumentation, data acquisition, and measurement techniques. (SP) Riemer, Seed

271. Elastic Signal Interpretation for Engineering Material Characterization. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Develop understanding of wave propagation and signal processing needed to rationally interpret system transient response and evaluate properties of engineering materials. Topics include waves and vibrations, damping, filters—analogue and digital, time vs. frequency domain analysis, spectral estimation—Fourier and Stochastic approaches, system identification. (SP) Glaws

272. Numerical Modelling in Geomechanics. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Constitutive laws for geotechnical materials including inelastic hyperbolic and elasto-plastic Cam-clay, soil behavior and critical state, and discontinuum mechanics. Application of the finite element method to static analysis of earth structures; the Discontinuous Deformation Analysis method. (SP) Bray, Pestana

274. Environmental Geotechnics. (3) Three hours of lecture per week. Prerequisites: 172, 175, or equivalents. Geotechnical practice in environmental protection and restoration. Methods of soil and site characterization for siting of waste repositories and site restoration. Influence of physical and chemical processes on the evaluation of contaminant distribution. Design of waste containment systems including landfill, slurry walls, and soil stabilization; the applicability and use of geosynthetics. Review of technologies for site restoration and cleanup. (SP) Sitar

275. Geotechnical Earthquake Engineering. (3) Three hours of lecture per week. Prerequisites: 175 or equivalent. Seismicity, influence of soil conditions on site response, seismic site response analysis, evaluation and modeling of dynamic soil properties, analysis of seismic soil-structure interaction; evaluation of soil liquefaction and its consequences, seismic code provisions and practice, seismic earth pressures, seismic slope stability and deformation analysis, seismic safety of dams and embankments, seismic performance of pile foundations, and additional current topics. (F) Bray, Seed

281. Engineering Geology. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: A course in physical geology. Prerequisites: Consent of instructor. Formerly Mineral Engineering 234. Broad coverage of geological and geotechnical applications of ground and airborne electromagnetic induction methods of geophysical exploration. Theoretical and laboratory models of exploration targets. Interpretation of results. Study of methods and procedures. Data interpretation. Illustrative examples drawn from surveys related to problems in archaeology, environmental contamination, geohydrology, coastal engineering, and the exploration of mineral deposits. (SP) Sitar


285B. Electrical Methods in Applied Geophysics. (2) Students will receive no credit for 285B after taking Mining Engineering 234 taken prior to Spring 2001. Two hours of lecture per week. Prerequisites: Graduate standing, FORTRAN programming language. Formerly Mineral Engineering 234. Theory of dc current flow in isotropic, layered, and anisohmogeneous earth models with emphasis on the design and interpretation of field measurement systems. Mechanisms of electric current flow in porous media, induced polarization, and coupled flow phenomena. (SP) Morison

285C. Seismic Methods in Applied Geophysics. (2) Students will receive no credit for 285C after taking Mining Engineering 236 after Fall 2001. Two hours of lecture per week. Prerequisites: An introductory course in seismology; upper division course in applied mathematics. Formerly Mineral Engineering 236. This course gives an overview of seismic methods used to image the subsurface. Reflection, refraction, and borehole methods are introduced. Acquisition, processing, and interpretation of seismic data as discussed with application to petroleum production, environmental site characterization and groundwater problems. (SP) Morison

285D. Gravity and Magnetic Methods in Applied Geophysics. (2) Students will receive no credit for 285D after taking Mining Engineering 236 after Fall 2001. Two hours of lecture per week. Prerequisites: Graduate standing. Formerly Mineral Engineering 230. The physical basis of gravity and magnetic surveying. Reduction to gravity and magnetic data. Theoretical and practical aspects of gravity surveys, interpretation and analysis of gravity data. Theoretical and practical aspects of gravity surveying, interpretation and analysis of gravity data. (SP) Becker, Morrison

286. Digital Data Processing. (3) Students will receive no credit for 286 after taking Mining Engineer- ing 240 taken before Fall 2001. Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Mineral Engineering 240. Considerations for digital signal processing and Fast Fourier Transforms, convolution and correlation. Discrete linear systems, Z transforms. Digital processing of seismic reflection data, convolution and migration. Introduction to 3-D seismic data. (F) Becker

290A. Human and Organizational Factors. Risk Assessing and Managing of Engineered Systems. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing. Design engineering aspects associated with achieving desirable quality (safety, reliability, functionality, affordability) and re- liability of engineered systems. Human and organi- zational factors in the life-cycle (design, construction, operation, maintenance, decommissioning) of reliability of engineered systems for maintaining high quality and reliability are advanced: proactive, reactive, and interactive (real-time) strategies and measures. (SP) Bea


290D. Earthquake Hazard Mitigation. (3) Three hours of lecture per week. Prerequisites: 225, 131 or 231. Conceptual basis for seismic isolation and energy absorbing techniques. Design rules for seismic isola- tion systems. Mechanisms of isolation bearings. Char- acteristics of frictional, metallic and polymeric energy absorbing devices. Guidelines for isolation sys- tems and devices and impact of code requirements. Offered odd-numbered years. (F) Mahin, Makris

290E. Design, Construction, and Maintenance of Marine Structures. (3) Three hours of lecture per week. Prerequisites: Graduate standing, FORTRAN programming language. Formerly Marine Engineering 240. Formerly Marine Engineering 290C. Active areas of research in applied seismology. Subjects include: anisotropic and viscoelastic wave propagation, borehole seismology, crosswell seismology, including crosswell seismic tomography, vertical seismic profil- ing, reservoir monitoring including passive seismic methods. (SP) Rector

290G. Advanced Topics in Electrical and Electro- magnetic Methods. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Intro- ductory course in seismology; 286 or Mineral Engi- neering 240, Formerly Mining Engineering 290C. Active areas of research in applied seismology. Subjects include: anisotropic and viscoelastic wave propagation, borehole seismology, crosswell seismology, including crosswell seismic tomography, vertical seismic profil- ing, reservoir monitoring including passive seismic methods. (SP) Rector

290L. Law for Engineers. (3) Three hours of lecture per week. Prerequisites: Graduate standing, FORTRAN programming language. Formerly Marine Engineering 290D. Approaches to law in the sciences, Z tranforms. Digital processing of seismic re- 

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R & requirement
AC suffix=course satisfies American cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
tablish both risk allocation and reciprocal liabilities. Issues of contract formation, performance, breach, and remedy are covered in detail. Standard of care and professional negligence are emphasized during the discussion of tort law. Other topics include regulation, legal relationships, litigation, and alternative dispute resolution. (F) Hillman

290M. Improving Performance in Engineering and Construction. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Students will understand the potential for, and obstacles to, improving performance. Will learn which data provoke and support positive changes. How to collect that data, and how to use the data. The perspective adopted will be that of the consultant. (F) Ballard

290N. Advanced Topics in Geological Engineering. (3) This course will cover the art and science of applying engineering and construction expertise from the working task level. Actual projects will be studied in terms of specific design and construction technologies. Major topics include constructability; subcontractor and supplier management; material control; quality and productivity management; and construction facilities and site development. (SP) Tonnelle

290P. Strategic Issues of the Engineering Construction Industry. (3) Three hours of lecture per week. Prerequisites: Graduate standing in civil and environmental engineering and construction in the present highly competitive market. Advanced methods of managing complex projects in all phases of activities starting with concept development, through engineering, design, procurement, construction, and operational startup. Project economics and finance are given special attention. (F) McDonald

290Q. Managing the Improvement Process in Engineering-Driven Organizations. (3) Course will alternate with 290M. Three hours of lecture per week. Discussion of competing theories of management, and alternative approaches to integrating work execution and improvement. The focus will be on engineering-driven organizations and sectors, such as electronics and the engineering construction industries. Offered even-numbered years. (F) Ballard

290R. Advanced Topics in Geological Engineering. (1-2) Course may be repeated for credit. Seminar meetings each week. Prerequisites: Consent of instructor. Recent applications or research in geological engineering and rock mechanics. Topics vary each term. (SP) Sitar

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) Daganzo, Newell

C290U. Transportation and Land Use Planning. (3) Three hours of lecture/discussion per week. Prerequisites: I 134 or equivalent. Examination of the interactions between transportation and land use systems; historical perspectives on transportation; characteristics of travel and demand estimation; evaluation of system performance; location theory; models of transportation and urban structure; empirical evidence of transportation-land use impacts; case study examinations. Also listed as City and Regional Planning C231U, Cervero

C290V. 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, and urban rail systems. Class will review the debates over the full social costs of transportation systems and current topics, including the politics of transportation sales taxes. Also listed as City and Regional Planning C231V, Cervero

290Z. Selected Topics in Air Transportation. (2) Two hours of lecture per week. Prerequisites: I 260 (may be taken concurrently). Current developments in air transportation. Topics of current interest, including methods of systems operations analysis, airport and airline planning, and issues of air transportation policy. Staff

C291A. Planning for Traffic Safety and Injury Control. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Multidisciplinary approach to planning for traffic safety and injury control. Topics include: pre-crash, crash, and post-crash injury physics, vehicle, roadway, traffic, driver, and environment; crash and injury causations; vehicle and occupant dynamics; accident investigation; crash and injury control measures; costs of injury and countermeasures; policy issues; safety and injury control programs. Also listed as Public Health C285. (SP) Ragland, Ossenbruggen

298. Group Studies, Seminars, or Group Research. (1-6) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Advanced studies in various subjects through special seminars on annually selected topics, 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. Must be taken on a satisfactory/unsatisfactory basis. Individual study 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

301. Workshop for Future Civil and Environmental Engineering Teachers. (1-3) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare for the various examinations required of candidates for doctoral degrees. May not be used for unit or residence requirements. (F,SP) Staff

Professional Courses

301W. Workshop for Future Civil and Environmental Engineering Teachers. (1-3) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare for the various examinations required of candidates for doctoral degrees. May not be used for unit or residence requirements. (F,SP) Staff

309. Transportation and Land Use Planning. (3) Three hours of lecture/discussion per week. Prerequisites: I 134 or equivalent. Examination of the interactions between transportation and land use systems; historical perspectives on transportation; characteristics of travel and demand estimation; evaluation of system performance; location theory; models of transportation and urban structure; empirical evidence of transportation-land use impacts; case study examinations. Also listed as City and Regional Planning C231U, Cervero

309V. 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, and urban rail systems. Class will review the debates over the full social costs of transportation systems and current topics, including the politics of transportation sales taxes. Also listed as City and Regional Planning C231V, Cervero

290Z. Selected Topics in Air Transportation. (2) Two hours of lecture per week. Prerequisites: I 260 (may be taken concurrently). Current developments in air transportation. Topics of current interest, including methods of systems operations analysis, airport and airline planning, and issues of air transportation policy. Staff

C291A. Planning for Traffic Safety and Injury Control. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Multidisciplinary approach to planning for traffic safety and injury control. Topics include: pre-crash, crash, and post-crash injury physics, vehicle, roadway, traffic, driver, and environment; crash and injury causations; vehicle and occupant dynamics; accident investigation; crash and injury control measures; costs of injury and countermeasures; policy issues; safety and injury control programs. Also listed as Public Health C285. (SP) Ragland, Ossenbruggen

298. Group Studies, Seminars, or Group Research. (1-6) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Advanced studies in various subjects through special seminars on annually selected topics, 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. Must be taken on a satisfactory/unsatisfactory basis. Individual study 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

601. Individual Study for Master’s Students. (1-6) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual study 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. 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

Professional Courses

301W. Workshop for Future Civil and Environmental Engineering Teachers. (1-3) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare for the various examinations required of candidates for doctoral degrees. May not be used for unit or residence requirements. (F,SP) Staff

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 object 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 undergraduate courses called Classics is to provide instruction in Greek and Roman civilization, in all its aspects—literature (read in translation), philosophy, mythology, religion, social and political life and archaeology. The latter courses require no knowledge of Greek and Latin; graduate courses, all of which are designated Classics, are advanced courses in Greek, Latin, and classical archaeology, all requiring knowledge of one or both of the 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 departmental undergraduate advisor 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 40 (may be taken concurrently with upper division courses); Greek 100, 101, and 102; four courses chosen from Greek 115-123; Classics 10A and 10B (under exceptional circumstances, the undergraduate advisor may authorize substitution of Classics 100A for Classics 10B); one course from the list of recommended courses available in the departmental office and on the Web site.

Major in Latin. Elementary Latin (either Latin 1-2 or Latin 10 or the Latin Workshop, offered during Summer Sessions); Latin 40 (may be taken concurrently with upper division courses); Latin 100, 101, and 102; four courses chosen from Latin 115-
Mandated courses available in the departmental 100B for 10B); one course from the list of recommended courses available in the departmental office and on the Web site.

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); either Greek 40 or Latin 40 (may be taken concurrently with division courses); Greek 100, 101, and 102; Latin 100, 101, and 102; two courses chosen from Greek 115-123, Latin 115-140; Classics 10A and 10B. Majors are encouraged to take additional courses from the list of recommended courses and lower division offerings in a non-Greco-Roman pre-industrial culture (please consult with the Classics undergraduate adviser in selecting these courses).

Minor in Classical Civilization. Lists of courses approved to meet the requirements described below are available from the departmental office and on the Web site.

(a) Prerequisites: Classics 10A and 10B (UGIS R44A may be substituted for one but not both).
(b) Lower division requirements: any two lower division courses in the Classics department (not including Classics 24), or courses from a selected list of courses in other departments.
(c) Area of concentration: Five courses (at least three courses 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 courses), Latin Language (five Latin courses including up to two lower division courses).
(d) Area of breadth: two courses from any combination of lower division courses in a non-Greco-Roman pre-industrial culture (please consult with the Classics 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.

Substitutions. Under exceptional circumstances the undergraduate adviser is empowered to authorize 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 3.3 and a GPA of at least 3.3 in the major. Consists of (a) 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 honors (Greek 115-123, Latin 115-140) must be in prose and at least one must be in poetry; (b) one semester of Greek H195 (for Greek or classical languages majors), Latin H195 (for Latin or classical civilizations majors), or Classics H195 (for classical civilizations majors); (c) H195 consists of largely independent study, including the writing of a thesis, the project undertaken in this one semester honors course (up to four units) must be related to work completed in a previous upper division course in the Classics department. The thesis will be evaluated by an Honors Committee of three members: the written thesis is due on Monday of the 13th week of the semester and the committee will agree upon the level of Honors (Honors, Highest Honors) and the grade to be awarded no later than the Monday of examination week.

The Minors

Minor in Classical Civilization. Five courses from Classics 110, 121, 130, 132, 155A, 155B, 163, 170, 175, 178, 180, Greek 100-102, 105, 115-123, Latin 100-102, 115-123, 140, 155.

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). For those desiring only a master's degree in Greek or Latin, the corresponding major in Greek or Latin may suffice, but some preparation in the other language is normally necessary. These programs should be regarded as minimum requirements. Students are urged to supplement the requirements for the major in Classical Languages with two or three senior reading courses (Greek 115-123, Latin 115-123). They are strongly advised also to have an adequate knowledge of French and German, since they must pass examinations in both for the Ph.D. degree, and in one of them for the M.A. degree. Prospective graduate students are also encouraged to take Advanced Prose Composition in Greek and Latin (Classics 250, 260) since the graduate programs require demonstration of competence in prose composition. Note that 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 Greek, Latin, Classics (each 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 dissertation).

The Doctor of Philosophy degree may be taken in Classics or Classical Archaeology. Whatever the major, study of civilization—literature, history, philosophy, 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 in Greek and Latin authors of all kinds since both M.A. and Ph.D. regulations require an extensive knowledge of literary, historical, and cultural context. They are strongly advised also to have an adequate knowledge of French and German, since they must pass examinations in both for the Ph.D. degree, and in one of them for the M.A. degree. Prospective graduate students are also encouraged to take Advanced Prose Composition in Greek and Latin (Classics 250, 260) since the graduate programs require demonstration of competence in prose composition. Note that the major in Classical Civilizations is not considered to be adequate preparation for graduate study.

Undergraduate Courses

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 in Greek culture from the Bronze Age to the 4th century B.C.E. 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 to provide the students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from semester to semester. (F,SP)

The Classic Myths. (4) Three hours of lecture and one hour of discussion per week. A study of myths, religion 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 B.C.E through 323 C.E.), as attested in literary, epigraphic, and papyrological sources. Attention is paid to the overall Mediterranean context and, in particular, Egyptian and Near Eastern influences on Greco-Roman traditions. 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 study of the two great epics 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 per week. Introduction to the philosophies of Socrates, Plato and Aristotle.

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R&G requirement
AG suffix=course satisfies American cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
175A. Athens. (4) Lecture per week. (F,SP)
175. Topography and Monuments.
170D. Roman Art and Architecture. (4)
170. Classical Archaeology.

Staff

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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) 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)

Upper Division Courses

100A. Greek Literature. (4) Three hours of lecture per week. Readings in Greek writers at the upper division level. (F)

100B. Latin Literature. (4) Three hours of lecture per week. Readings in Latin writers at the upper division level. (SP)

110. Ancient Metrics. (2) Two hours of lecture per week. Prerequisites: Greek 2 or 10. The principles of ancient metre of all types.

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 writers 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. Topic to vary from year to year. No knowledge of Greek or Latin required; but provision will be made for students who wish to study some of the readings in the original language. Enrollment limited.

161. Gender, Sexuality, and Culture in the Ancient World. (4) Course may be repeated for credit as topic varies. Three hours of lecture/discussion per week. Study of topics in gender, feminism, and sexuality in ancient cultures. Topics to vary from year to year. (F,SP) Staff

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. Hellenistic philosophy, neo-Platonism.

170. Classical Archaeology. Three hours of lecture per week. (F,SP)

170A. Greek Vase Painting. (4)
170B. Greek Sculpture to 400 B.C. (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)

Greek

Courses in this group are designated Greek 1, 2, etc.

Lower Division Courses

1. Elementary Greek. (4) Three hours of lecture per week. Beginners’ course. (F,SP)

2. Elementary Greek. (4) Three 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 Greek 1-2. (SP)

40. Intermediate Greek Prose Composition. (4) Three hours of lecture per week. Beginners’ course. (F,SP)

120. Herodotus. (4) 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 or 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.

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 program. Large independently study for one semester building on work in a previous upper division course used in fulfillment of the 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 honor 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 honor students. (F,SP)

Latin

Courses in this group are designated Latin 1, 2, 40, etc.

Lower Division Courses

1. Elementary Latin. (4) 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 per week 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. 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. (4) 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). (F,SP)

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. (F,SP)

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. (F,SP)

118. Satire. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 101 or 102. Readings in Roman satirists. (F,SP)

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. (F,SP)

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. (F,SP)

121. Tacitus. (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 Tacitus. (F,SP)

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 Pliny, and other prose writers. (SP)

123. Petronius and Apuleius. (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 Petronius and Apuleius. (F,SP)

140. Medieval Latin. (4) Three hours of lecture per week. Prerequisites: 100. Introduction to medieval Latin: readings in prose and poetry from Cassiodorus to the Italian Renaissance, with emphasis on certain periods. (F,SP)

C140. Medieval Latin. (4) Three hours of lecture per week. Prerequisites: 100 or consent of instructor. Introduction to Medieval Latin: selected readings in prose and poetry from Late Antiquity to the end of the Middle Ages, with attention to the special characteristics of the Latin language during this period. (F,SP)

155A-155B. Readings in Medieval Latin. (4;4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100 or 101 or 102 or 140, or consent of instructor. Selection of texts from the early, high, or late medieval periods.

A. Focuses on prose.

B. Focuses on the poetic tradition.

H195. Honors Course in Latin. (4) 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 Latin 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)

199. 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 honor students. (F,SP)

Graduate Courses

Classics

The proseminar (Classics 200) is prerequisite to all graduate seminars; this requirement does not apply to graduate courses that are not seminars proper (namely, Classics 210A-210B, 220A-220B, 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 philology, to methods of research, and to 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 analysis 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.

210. Greek Hexameter Poetry, (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 210A-B. Homer, Hesiod, Greek Hexameter poetry, Homer, Hesiod.

211. Archaic Greek Poetry. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 210D. Topics in iambic, elegiac, and lyric poetry from Archilochus to Pindar.

213. Hellenistic Poetry. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four 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. Two units to be graded on a satisfactory/unsatisfactory basis. Four 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.

216. Greek Historians. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Topics in the orators or the Greek rhetorical tradition.

218. Greek Philosophers. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be taken on a letter-grade basis. Prerequisites: 200. Formerly 218A-D. Study of PreSocratic, Plato, Aristotle, and Stoic philosophy, or other topics in ancient Greek philosophy through Plotinus.

219. Ancient Novel. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four 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-220B. Greek and Latin Epigraphy. (2,4;2,4) Three hours of lecture per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four 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 seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: Greek 101 and 102 or graduate standing. Survey 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 the linguistic characteristics of a few literary and epigraphic dialects will be compared.

223. Comparative and Historical Grammar of Latin. (2,4) Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: Latin 101 and 102 or graduate standing. Survey of the evolution of Latin from its reconstructed ancestor, Proto-Indo-European, as attested in antiquity. The development of Latin phonology, morphology, and syntax will be examined, and the linguistic characteristics of a few literary and epigraphic examples will be compared.

234. Classical Poetics and Rhetoric. (2,4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Anciant views of literature; theories and practice of criticism, scholarship, and education, from Homer to Byzantium.
226. Myth and Literature. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. A study of 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. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 238. Study of social, legal, or administrative structures of the Greek or Roman world.

229. Ancient Religion. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Study of cults and rituals with regard to fundamental aspects of Greek or Roman religion or both, such as sacrifice, purification, cult and literature, hero cult, politics and religion, and life after death.

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. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 230A-G. Study of Lucretius, Vergil, Horace, Ovid, or other topics in Latin poetry from Ennius to Juvenal.

232. Roman Drama. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 235A-C. Study of Plautus, Terence, Seneca, or other topics in Roman drama. (F)

234. Roman Historians. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 236A-E. Study of Caesar, Sallust, Livy, Tacitus, or other topics in Roman history or historiography.

235. Latin Philosophers. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 237A. Study of Cicero, Seneca, or other topics in the history of Roman philosophy.

236. Latin Oratory and Rhetoric. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 238A-C. Study of Cicero, Quintilian, or other topics in Latin oratory and rhetoric.

239. Topics in Roman Literature, History, and Culture. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Select problems in Roman imperial literature and history from 69-235 A.D. (F,SP)

240. Greek and Roman Literature 100-500 A.D. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Topics in the literature of the 2nd through 5th centuries.

241. Latin Literature of the Middle Ages. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 245A-B. Topics in Latin literature from the period 500-1300.

C241. Latin Literature of the Middle Ages. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: 200 or consent of instructor. Reading and discussion of ancient and contemporary texts and documents dealing with selected aspects of ancient Mediterranean culture. Topics will vary from semester to semester. (F,SP)

245. Reading Seminar. (2) Course may be repeated for credit. Two hours of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Reading and discussion of ancient and contemporary texts and documents dealing with selected aspects of ancient Mediterranean culture. Topics will vary from semester to semester. (F,SP)

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.

251. Greek Dialects. (2,4) Three hours of lecture per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: Graduate status or permission of instructor. The emphasis will be on epigraphical rather than literary texts. Among topics included will be an introduction to study of dialectology, interrelationships of the various dialects, and development of the dialects in postclassical times.

260. Advanced Latin Composition. (4) Course may be repeated for credit. 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. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Advanced study of ancient Greek art objects and sites.

275. Pan-Hellenism and Nemea. (2,4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Study of the Pan-Hellenic centers with particular emphasis on Nemea.

297. Field Study in Archaeology. (2-12) Course may be repeated for a maximum of 15 units. Supervised study in archaeology. (F,SP)

298. Special Study. (2-8) Course may be repeated for credit. Prerequisites: Completion of qualifying examination for the Major in Late Antiquity. May be taken on a satisfactory/unsatisfactory basis. Three hours of laboratory per week. Two units to be graded on a satisfactory/unsatisfactory basis. Reading and research directed toward specific goals and tailored to the student's interests. (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. (1-12) Course may be repeated for credit. Must be taken 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 a 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, 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. Teaching of Classics: Methods and Problems. (3) Course may be repeated for credit. Four 2-hour seminars per term plus individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or T4 status. Seminar in the practice of teaching. Required for all new teaching assistants. (F,SP)

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 Latin courses or of discussion sections in Classics. Two supervisors normally required for Ph.D. candidates. (F,SP)

Cognitive Science (College of Letters and Science)

Group Major Office: Undergraduate and Interdisciplinary Studies, 301 Campbell, (510) 642-2628 http://ls.berkeley.edu/ugis/cogsci/

Director and Major Adviser
Eve Sweetser (Linguistics/Celtic Studies)

Faculty Members
Martin Banks (Optometry)
Mark D’Esposito (Psychology)
Andrea diSessa (Education)
Susan Ervin-Tripp (Psychology)
Jerome Feldman (Computer Science)
Allison Gioggi (Psychology)
Ervin Hefter (Psychology)
Richard Ivy (Psychology)
Lucia Jacobs (Psychology)
John Kilstrom (Psychology)
Robert Knight (Psychology)
George Lakoff (Linguistics)
Jitendra Malik (Computer Science)
Sam Meltzer (Virology)
John Ohala (Linguistics)
Stephen Palmer (Psychology)
William Prinzmetal (Psychology)
Michael Ramney (Economics)
Richard Rhodes (Linguistics)
Lynn Robertson (Psychology)
Eleanor Rosch (Psychology)
Stuart Russell (Computer Science)
Alan Schoedel (Education/Mathematics)
John Searle (Philosophy)
Arthur Shimamura (Psychology)
Dan Simon (Psychology)
Robert Wilersky (Computer Science)

Emeritus Faculty
Hubert Dreyfus (Philosophy)
Charles Fillmore (Linguistics)
Paul Kay (Linguistics)
Lotti Zadeh (Computer Science)

Student Affairs Officer: Ms. 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, Mathematics 1A, Molecular and Cell Biology 61, and one of the following: Statistics 2, 20, 21, 25, or Mathematics 55 or Computer Science 70. (Mathematics 55 or Computer Science 70 are recommended for students planning to concentrate in Computational Modeling.)

Upper Division Core Requirements: Cognitive Science C100/Psychology C120B and Cognitive Science C101/Linguistics C105.

In addition to the two core courses required of all majors, students must complete three courses from their chosen area of concentration and a single course from each of the other areas of non-concentration. The areas of concentration are: Cog-
Students interested in the major should consult at least 3 units of course H195A-H195B or 199.

To study with a member of the Cognitive Science faculty and write a thesis of high quality, based upon independent study with a member of the Cognitive Science faculty, students not concentrating in Cognitive Psychology must take Psychology 117 or Psychology/Cognitive Science C127.

Computational Modeling

Students concentrating in Computational Modeling must take Computer Science 188 and two courses from the following list: Computer Science 61B, Computer Science C182/ Cognitive Science C110/Linguistics C109, Computer Science 160, 170, 186, 280, 287, 288, 289. Students not concentrating in Computational Modeling must take Computer Science 188.

Linguistics


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, 155. Additional courses include: Philosophy 129, 130, 140, 174, 175, 176, 185, 186, 188, Cognitive Science/Linguistics C108. Students not concentrating in Philosophy must take a course from the core courses list.

Honors Program

Cognitive science majors who wish to graduate with honors must have an overall grade-point average of 3.50 or higher in all work completed in the University and a 3.50 grade-point average 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 marked by satisfactory completion of at least 3 units of course H195A-H195B or 199.

Students interested in the major should consult with the student advisor in 349 Campbell Hall, 510-642-2628.
Consent of instructor. Weekly presentations by local and visiting researchers on a range of topics in Cognitive Science, with ensuing discussion. (F,SP)

**College Writing Programs**

(201 Dwainelle Annex, (510) 642-5570)

http://www-writing.berkeley.edu

Lecturers

Yuet-Sim C. Chiang, Ph.D.
Caroline Cole, Ph.D.
Ellen Cushman, Ph.D.
Melinda B. Erickson, M.A.
Jane Hammons, M.A.
Gail Offen-Brown, M.A.
Margaret E. Sokolik, Ph.D.
Stephen K. Tellis, M.A.
Kimberly S. Davis, M.A. (Emeritus)

Program Overview

College Writing Programs, a unit within the Division of Undergraduate and Interdisciplinary Studies in the College of Letters and Science, has as its overall instructional aim to help undergraduates to establish fluency and control over their own writing and reading skills, in a seminar setting, at an accelerated, intensive pace, and with full access to the broad range of institutional support services and resources. Students who fail their Subject A examination will satisfy the Subject A requirement and the first half of their Reading and Composition requirement by taking College Writing 1A. Auditors are not permitted. (See "University Requirements" in the Undergraduate Education section in the front of this catalog for additional information.)

**Lower Division Courses**

1. **Idiomaticity and Editing.** (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 intended to serve as an intensive preliminary course for College Writing Programs 1A level students who are non-native speakers of English and who wish to work on the idiomaticity of their English before enrolling in College Writing 1A. The purpose of the course is to develop students' ability to edit their own writing and to identify high frequency 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. Prerequisites: Placement by Subject A examination. Formerly 1A. An intensive, accelerated course satisfying concurrently the requirements of Subject A and the first half of Reading and Composition. 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

98. **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.** (3) Course may be repeated for credit. Three hours of lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor, lower division standing. Independent study in topics not covered by regularly scheduled courses. Student must initiate topic and present a written proposal. (F,SP) Staff

**Interdepartmental Studies Courses**

Upper Division Course

IDS 140. Technical Communication for Non-Native Speakers of English. (3) Three hours of lecture per week. Prerequisites: English 1A, or equivalent course. upper division or graduate standing. Emphasis on improving language skills and use of the rhetorical conventions of technical presentations. This course is designed to prepare non-native speakers for the more advanced work in Engineering 190. Sponsoring departments: College Writing and the College of Engineering. (F,SP) Jones

**Comparative Biochemistry**

(College of Letters and Science, Interdepartmental Graduate Groups)

Chair: Jack Kirsch, Ph.D.

Professors

Bruce N. Ames, Ph.D. (Molecular and Cell Biology and Lawrence Berkeley National Laboratory)
Vittorio Ferro-Luzzi, Ph.D. (Molecular and Cell Biology)
George A. Brooks, Ph.D. (Integrative Biology)
Bob B. Buchanan, Ph.D. (Plant and Microbial Biology)
John E. Casida, Ph.D. (Environmental Science, Policy, and Management)
Douglas S. Clark, Ph.D. (Chemical Engineering)
Peter Duesberg, Ph.D. (Molecular and Cell Biology)
Gary L. Firestone, Ph.D. (Molecular and Cell Biology and Lawrence Berkeley National Laboratory)
Sung-Hou Kim, Ph.D. (Chemistry and Lawrence Berkeley National Laboratory)
Jack F. Kirsch, Ph.D. (Chemistry, Molecular and Cell Biology, and Lawrence Berkeley National Laboratory)
Daniel Koster, Ph.D. (Molecular and Cell Biology)
Isao Kubo, Ph.D. (Environmental Science, Policy, and Management; Nutrition)
Stuart M. Lynn, Ph.D. (Molecular and Cell Biology)
Fenying Liu, Ph.D. (Public Health)
Anastassios Melis, Ph.D. (Plant and Microbial Biology)
Lester Packer, Ph.D. (Molecular and Cell Biology and Lawrence Berkeley National Laboratory)
Kenneth Saul, Ph.D. (Chemistry and Lawrence Berkeley National Laboratory)
Howard K. Schachman, Ph.D. (Molecular and Cell Biology)
George F. Sensabaugh, D.Crim. (Public Health)
Barry Shane, Ph.D. (Nutritional Sciences and Toxicology)
Martyn T. Smith, Ph.D. (Public Health)

Associate Professors

Nancy Amy, Ph.D. (Nutritional Sciences and Toxicology)
Georges W. Chang, Ph.D. (Nutritional Sciences and Toxicology)
Benito O. De Lumen, Ph.D. (Nutritional Sciences and Toxicology)

Graduate Advisers: Ms. Amy, Mr. Casida, Mr. Sensabaugh, Mr. Shane.

Program Overview

The Interdisciplinary Graduate Group in Comparative Biochemistry administers the Ph.D. and M.A. degrees for students interested in a biochemical and molecular approach to problems in the biological sciences. Students work under the supervision of faculty from diverse disciplines including Molecular and Cell Biology; Nutritional Sciences and Toxicology; Molecular Plant and Microbial Biology; Chemistry; Environmental Science, Policy, and Management; Public Health; and research units such as the Chemical Biodynamics Laboratory and Lawrence Berkeley National Laboratory.
Comparative Literature (College of Letters and Science)

Department Office: 418 Dwinelle Hall, (510) 642-1202
http://www.is.berkeley.edu/dept/complit/dept.html
Chair: To be announced

Department Office: 4118 Dwinelle Hall, (510) 642-1202

Literature

The Department of Comparative Literature offers students an opportunity to develop their ability to read literary texts responsibly and critically; to study one literature in depth and another selectively; to acquire a broader sense of literary history and of literary traditions; and to understand how a single literature could furnish: to explore the contacts between writing and other pursuits; to acquaint themselves with some of the significant writings in the theory of literature; and to prepare themselves for methodological investigation of issues involving more than one literature.

Students must have fulfilled the requirement in Subject A 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, or phone (510) 642-1356. Information is also available online at http://www.ias.berkeley.edu/bpsa.

The Major

The emphasis of the undergraduate major is on a broad understanding of literary and cultural phenomena rather than on specialized skills, 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 the principles acquired in the junior course and undertake a study project involving several literary traditions. The requirements for the A.B. with a major in Comparative Literature are listed below.

Requirements: Lower Division. 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).

Requirements: Upper Division. Students interested in the honors program should be admitted to upper division literature courses in the senior year. A reading knowledge of one classical language is required in the junior course and undertake a study project involving several literary traditions. The requirements for the A.B. with a major in Comparative Literature are listed below.

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Requirements: Lower Division. 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).
courses of members of the Department of Comparative Literature and other related departments. A final examination on the dissertation and its immediate area may be required.

Lower Division Courses

H1A-H1B. English Composition in Connection with the Reading of World Literature. (4,4) Three hours of discussion per week, and individual conferences. Prerequisites: (a) Subject A examination, (b) a C grade point average in high school English, (c) a reading knowledge of an ancient or modern foreign language, and (d) permission of the instructor. Expository writing based on analysis of selected masterpieces of ancient and modern literature. Limited to 10 qualified freshmen and/or sophomores who meet for roundtable discussions and attend weekly tutorial sessions. Individual assignments provide students 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. (F,SP)

R1A-R1B. English Composition in Connection with the Reading of World Literature. (4,4) Three hours of lecture per week plus individual conferences. Prerequisites: Subject A examination or course. 1A or equivalent is prerequisite 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. (F,SP)

R2A-R2B. English Composition in Connection with Reading of World and French Lit. (5,5) Five hours of lecture per week. Three years of high school French or two years with a B plus average. Formerly 2A. 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. (F,SP)

R3A-R3B. English Composition in Connection with Reading of World and Hispanic Literature. (5,5) Five hours of lecture per week. Prerequisites: Three years of high school Spanish or two years with a B average. 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, and R3B satisfies the second half. (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 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 fifteen freshmen. (F,SP)

30B. Seminar in World Literature. (4) Three hours of discussion per week. Prerequisites: Consent of the instructor. Seminar in a formal and comprehensive study of world literature with round table discussions and individual assignments. Limited to 15-20 students with freshman and/or sophomore standing.

39. Freshman/Sophomore Seminar. 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. 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. Participation 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. (F,SP)

41. Introduction to Literary Forms. Three hours of lecture per week. Comparative study of masterpieces of world literature.

41A. Forms of the Epic. (4) 41B. Forms of the Lyric. (4) 41C. Forms of the Novel. (4) 41D. Forms of the Drama. (4) 41E. Forms of the Cinema. (4)

41F. Forms of Literary Theory. (4)

42. Sexuality and Culture. (4) Course may be repeated once for credit with different topics. Three hours of lecture per week. Formerly 39. A study of sexuality as articulated in literature and culture from a comparative perspective. Selected readings on a topic which varies from semester to semester. (F,SP)

60AC. Topics in the Literature of American Cultures. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture/discussion per week. Study of the ethnocultural diversity of American literature. Topics will vary from semester to semester, but may include such themes as Cultures of Gender, Race, Ethnicity, Sexuality in U.S. Literature, Race and Identity. Students should consult the department's course bulletin before the beginning of the semester for details. This course satisfies the American cultures requirement. (F,SP)

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: Three hours of lecture per week. Course is designed to fulfill a need intrinsic to the undergraduates 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 framework or bias of selection. (F,SP)

185. Gender, Sexuality, and Culture. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture/discussion per week. Comparative study in gender, feminism, sexuality in various national literatures and cultures. Topics will vary from year to year.

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. Prerequisites: Senior standing; 100 and one course from the 151-160 series (the latter may be taken concurrently). Seminar-style treatment of a major topic in Comparative Literature. Substantial paper required. (F,SP)

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,SP)

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. Enrollment restrictions apply. (F,SP)

Graduate Courses

The following graduate courses numbered 200 through 300 are required for the graduate degree in English Literature.

200. Approaches to Comparative Literature. (4) Three hours of lecture/discussion per week. Prerequisites: Admission to graduate standing in Comparative Literature. Lectures on literary theory, 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 the graduate career, issues that pertain to specifically graduate school life, and issues currently being debated across the profession. The readings for the course will consist of copies of materials by the department's faculty. (F)

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
215. Studies in Renaissance 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 fifth and the fourteenth centuries. May be repeated for credit. Hours to be arranged. Mandatory lab. (F,SP)

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 fourteenth centuries. A maximum of two courses in the Renaissance period may be counted toward a major. (F,SP)

205. Studies in Ancient 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. (F,SP)

221. Aesthetics as Critique. (4) Three hours of lecture per week. Formerly C221. A close reading of 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 nineteenth-century literature and culture. (F,SP)

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. (F,SP)

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 consent of the instructor. Comparative investigation of a literary topic requiring the study of both Near Eastern and Western documents.

235. Studies in the Relations Between Classical and Christian, Jewish or Islamic Literary Traditions. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages. Comparative investigation of a topic in the literature of the period.

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 study of the histori- cal and systematic relations between literature and other arts such as the visual arts, music, and film.

250. Studies in Literary Theory. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages. Comparative investigation of a topic in the theory of literature.


253. Studies in Literary Criticism. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages. Comparative investigation of a topic in evaluative criticism and literary analysis. (F,SP)
GPA cutoff may be admitted on the basis of additional information. Alternatively, early admission will be considered for those students who are in the process of completing all of the eight lower division technical prerequisites for the major with a GPA of 3.7 or above. Included in this group of courses must be CS 61A and CS 61B or CS 61C. Students submit applications for the major to the Computer Science Advising Office, 377 Soda Hall (510) 642-7214.

Transfer students admitted to Berkeley must, in addition, apply separately to the computer science major. Not all transfer students meet the stringent criteria expected for admission to 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 Requirements: 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 (Math 55) or Discrete Mathematics and Probability Theory (CS 70);
3. Electronics (EE 42 or 40). It is strongly recommended that EE 43, a 1-unit laboratory course, be taken concurrently with EE 42.

All of the above courses must be graded; none may be passed/graded

Upper Division Requirements: A total of 27 units of upper division courses including:

1. Core courses (CS 150, and either CS 162 or 164, and CS 170);
2. Breadth courses from two of the following areas:
   a. Hardware (CS 152);
   b. Software (CS 162 or CS 164, i.e., a course different from that taken to satisfy the core requirement);
   c. Theory (CS 172 or CS 174);
3. An upper division mathematics or statistics course (Math 160 and Stat. 131A, 131B, or 131F) which are not acceptable; Engineering 118 may be used to satisfy this requirement;
4. Technical electives, subject to the approval of a faculty advisor. A list of technical electives for which approval will be routinely granted is available at the Advising Office.

*Note that requests for substitutions of upper division technical requirements are currently being considered.

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. This division monitors the progress of majors and expects them to maintain a 2.0 GPA from semester to semester.

Honors Program: Students enter the honors program by application. Applications are available in the CS Advising Office, 377 Soda Hall. If admitted, students must satisfy the major listed below. An official notation of the honors degree is made on their final Berkeley transcripts.

Students must:

1. Accumulate a 3.5 GPA in all courses in the major.
2. Accumulate a 3.5 GPA overall.
3. Successfully declare a computer science major.
4. Complete three upper division computer science core courses: CS 150, CS 170, and either CS 162 or CS 164.
5. Complete at least 27 units of upper division computer science course (including the core courses).
6. Complete 4 units of CS 199 work over one academic year. Students must document the completed work in an archival project report. They are responsible for designing independent research with a faculty member.

For graduation with high honors or highest honors, see the Guide for Students in the College of Letters and Science

Minor in Computer Science

A minor in computer science is available to all undergraduate students at Berkeley with a declared major, except CS and EECS majors, through the College of Engineering. Lower division technical requirements are Math 55, or CS70, CS 61A-61B-61C with a GPA of 2.0 less than the technical GPA cutoff for admission to the major. Students approved for the minor are given the opportunity to take three upper division CS courses subject to availability, but with higher priority than other non-CS majors. Applications and more information on the CS minor are available at the Computer Science Advising Office, 377 Soda Hall, (510) 642-7214.

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 Electrical Engineering and Computer Sciences section of this catalog.

Dance

(College of Letters and Science)


For information about dance courses and curricula, see information listed under Theater, Dance, and Performance Studies.

Demography

(College of Letters and Science)

Department Office: 2232 Piedmont Avenue, (510) 642-9800
Chair: Kenneth W. Wachter, Ph.D.

Professors

Eugene A. Hammel, Ph.D. Historical and anthropological demography, social demography, social and economic development.
Ronald Lee, Ph.D. Economic, mathematical, and historical demography; development (Demography and Economics)
Kenneth Wachter, Ph.D. Mathematical demography, kinship, aging, censuses, simulation, biodemography (Anthropology and Statistics)

Associate Professor

John R. Wilmoth, Ph.D. Mortality, demographic methods, social demography (Demography)

Assistant Professors

Jennifer Johnson-Hanks, Ph.D. Fertility, nuptiality, education, social organization, qualitative methods, Africa (Anthropology)

Affiliated Faculty

Jan DeVries, Ph.D. (History)
Albert Fishlow, Ph.D. (Economics)
Paul Gertler, Ph.D. (Public Health, Business Administration)
Jon Gjerde, Ph.D. (History)
Leo Goodman, Ph.D. (Sociology)
Michael Hout, Ph.D. (Sociology)
Hillary Hynes, Ph.D. (Economics)
Jane Maudlin, Ph.D. (Public Policy)
Daniel McFadden, Ph.D. (Economics)
Richard Sutch, Ph.D. (Economics)
Michael Tarter, Ph.D. (Public Health)

Graduate Adviser: Mr. Wilmoth.

Department Overview

The Department of Demography offers a highly interdisciplinary training program leading to the M.A. and Ph.D. in demography. Demography is an increasingly important area of study, with important links to many pressing policy issues such as economic development of Third World countries, population aging, the environment, health and mortality, family change, economic activities of women, immigration and ethnicity, and declining birth rates. It also has strong links to other fields such as economics, sociology, social history, anthropology, and statistics. The program 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 quantitative aspects of demography and demography in the context of social science theory.

The master’s degree is designed 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 the doctoral degree in a related discipline. Doctoral students in demography are required to have or take a master’s degree in an allied discipline; the basic course work for the master’s program is required for the doctoral degree as well. Students already enrolled at UC campuses or Stanford are admissible to demography courses if they have completed the prerequisites. They not at Berkeley must make the necessary intercampus exchange arrangements. Students are admissible to the graduate courses by consent of the instructor. Although there is no undergraduate major, the Department of Demography offers an undergraduate minor in demography. The minor is open to all interested undergraduates on the Berkeley campus.

Students already enrolled in another graduate program at Berkeley who wish to earn a degree in demography may apply by executing a change of major or addition of major. Students not already enrolled in the University who wish to enter the degree programs or who wish to pursue course work only, for professional upgrading, should apply to the chair. General deadlines for application specified by the Graduate Division apply. The general requirements of the Academic Senate and the Graduate Division for degree programs apply. For specific degree requirements, please inquire of the chair.

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 population studies. Students in the minor must complete, with a grade-point average of at least 2.0 (C), a total of five upper division courses. All courses applied to the minor must be taken with a letter grade. The courses are chosen as follows:

1. Three required courses: Demography 110, 126, and 175. (When offered, Anthropology 189 or Demography 100 may be substituted for Demography 126.)
2. One elective course from Public Health 140, 141, or 143; Economics 141; Sociology 105; Statistics 131A, 131B, or 131F.
3. One elective course from Demography 135, 140, 145, 164; Economics 155; History 137; Sociology 111, 125.

Equivalent courses (or appropriate graduate-level courses) may be substituted with the consent of
the graduate adviser. At least three of the five courses must be completed at Berkeley.

Upper Division Courses

110. Introduction to Population Analysis. (3) Three hours of lecture per week. Measures and methods of Demography. Life tables, fertility and mortality measures, age pyramids, population projection, measures of fertility control. (F) Wachter

C126. Population Issues. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1 or consent of instructor. Introduction to population issues and the field of demography, with emphasis on historical patterns of population growth and change during the industrial era. Topics covered include demographic transition, resource issues, economic development, the environment, population control, family planning, birth control, family and gender, aging, intergenerational transfers, and international migration. Also listed as Sociology C126.

140. Human Migration. (2) Two hours of lecture for seven and one-half weeks. This course is a one-semester introduction to the study of human migration, designed for upper-level undergraduates in the social sciences and for graduate students in demography. In this course students will (1) gain a working knowledge of historical and contemporary migration patterns, both between and within nations; (2) learn about the central issues in the measurement and analysis of migration data; (3) analyze statistical and empirical studies on the economic causes and consequences of human migration; and (4) complete an individual project in which they analyze migration data for a specified group. (F,SP) Staff

154AC. The American Immigrant Experience. (4) One hour of lecture, three hours of supervised laboratory and three hours of self-paced laboratory. This course examines the social, economic, and demographic impacts of four major groups: Asian Americans in the 19th and 20th centuries; African Americans from the South to the North in the 20th century, and Hispanics (or Latinos) in this century. The course will examine the migration experience and the context of life in the new environment, explicitly attempting to set these experiences in a comparative perspective. The course uses computer technology, geographical information systems (GIS) and Internet technology to explore historical, statistical, and documentary sources. No prior computing experience is necessary. Also listed as History C139B. This course satisfies the American cultures requirement. Kjerde, Hammel, Mason

C164. Impact of Government Policies on Poor Children and Families. (4) Three hours of lecture per week. Formerly 164. Examination of the impact of policies of state intervention and public benefit programs on children and families, introduction to child and family policy, and study of specific issue areas, such as income transfer programs, housing, health care, and child abuse. Also listed as Political Science C164. (F) Paulson

C175. Economic Demography. (3) Three hours of lecture per week. Prerequisites: Economics 1 or 2. Formerly 175. A general introduction to economic demography, addressing the following kinds 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 populations? How has the size of the baby boom affected its economic well-being? Why has fertility been high in Third World countries? African and Latin American countries, why are 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 Economics C175.

C193. Introduction to Social Science Computing. (3) One hour of lecture and one hour in a demonstration laboratory setting with two hours of supervised laboratory and an average of four hours of self-paced laboratory per week. Introduction to our major-assisted technical report and grant proposal writing in the social sciences. Structure and content of reports. Overview of demographic, ecological, economic, and social factors. Use of computers and information technology; Internet access, machine-readable archival and other data sources, statistical summaries and graphics, Web pages. Students may choose a Mac/PC lab or a UNILAB laboratory. Also listed as Undergrad Interdisciplinary Studies C193 and Anthropology C193.

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: 60 units; good academic standing. Undergraduate research by small groups. Enrollment is restricted by regulations governing 198 courses. (F,SP)

199. Supervised Independent 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: Consent of instructor. Supervised independent study and research. (F,SP)

Graduate Courses


211. Advanced Demographic Analysis. (4) Three hours of lecture per week, (1) Population Studies 110, or consent of instructor. Stable population theory, demographic measurement, and estimation procedures for flawed and incomplete data. Sensitivity testing of demographic measurement using microsimulation. Wilmot

213. Practical Computer Applications for Demographic Analysis. (1) Three hours of demonstration and laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. This course is to equip students to carry out standard aspects of demographic analysis on typical workstations and other computing facilities available to the department. (F) Mason

220. Human Fertility. (4) Three hours of lecture per week. Theoretical models and empirical measures of fertility; comparative analysis of social, economic, and demographic factors influencing reproductive trends and differentials; population and family planning policies in industrializing and less developed countries in historical and contemporary perspective. Staff

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 populations; trends and differentials by age, sex, race, occupation and marital status. Consequences of mortality declines for fertility change and development. Staff

236. Aging: Economic and Demographic Aspects. (2) Three hours of lectures/discussion per week. Prerequisites: Advanced undergraduate students may attend with consent of instructor. Population aging is a global phenomenon. Course considers demographic aspects and future outlook; consequences for pension systems; labor supply and retirement; health and disability; institutional and familial assistance; poverty and family status; savings, wealth, and bequests. Offered first half of semester. (SP) Lee

240. Human Migration. (2) Three hours of lecture for seven and one-half weeks. Human populations and societies have been shaped from the stand point of their spatial distribution and movement. Special attention to rural-urban migration, metropolitan structure, inter-regional movement, and international migration, and the analysis and evaluation of immigration and emigration data and statistics, migration policies. (F,SP) Staff

241. Immigration: Economic and Demographic Aspects. (2) Three hours of lecture/discussion per week for seven weeks. Prerequisites: Advanced undergraduate students may attend with consent of instructor. Emphasis on U.S. immigration. Immigrants’ characteristics; demographic behavior; how they shape U.S. population. Labor force behavior and economic assimilation. Effect on U.S. workers, and on prices and economic growth. Immigration and taxes; effect on tax payers. Offered first half of semester. (SP) Lee

250. Mathematical Demography. (2-4) Three hours of lecture per week. Prerequisites: Consent of instructor. Systematic development of the mathematical theory of human population structure. Deterministic and stochastic models of population growth, stable population theory, demographic feedback models, approach to stability, ergodic theorems. Course will be structured in such a way as to allow UC Berkeley students to receive full UC credit for a 15-week course. UCLA students will receive credit for a 10-week self-contained part of the course (2-3 units). (W) Wachter

260. Special Topics in Demography Seminar. (4) Course may be repeated for credit as topic varies. Two hours of seminar meetings per week. Including lectures by special invited speakers, per week. Prerequisites: Consent of instructor. Special topics in demography, such as anthropological and evolutionary approaches, kinship and family structure, race and ethnicity, and similar specialized or new topics in the field of demography will be covered. Seminar will be offered according to student demand. (F,SP) Staff

268. Applied Demography. (3) Three hours of seminar per week. Prerequisites: 110, Business Administration 230, or consent of instructor. This course focuses on how demographic methods and a demographic perspective can be used to help solve problems of local governments and businesses in the United States. Areas that will be covered include school enrollment forecasting, health care planning, market research, location analysis, and civil rights analysis. Experience of the instructor and other demographic consultants will be used to demonstrate how demographic training can be valuable in a non-academic setting. Staff

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, economic growth, transfers and urbanization. Economic determinants of fertility, mortality and migration. Also listed as Economics C275A. (F,SP) Lee

293. Advanced Research Seminar. (4) Course may be repeated for credit. Three hours of seminar per week. Special research topics in advanced areas, by lectures or seminar conferences on topics to be announced. Staff

295. Research Design. (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, and special aspects of technical demographic research. Required of graduate students in the Ph.D. program in Demography. 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, and special aspects of technical demographic research. Required of graduate students in the Ph.D. program in Demography. Staff

298. Directed Reading. (1-12) Course may be repeated for credit. Prerequisite: 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, including the coupling of theory and methods. Required of graduate students in the Ph.D. program in Demography. 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 adviser, intended for qualified students to do necessary work to prepare themselves for comprehensive 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
Development Studies

Group Major Office: International and Area Studies, 101 Stephens Hall, (510) 642-4466

Major Advisers
Miguel A. Alteri (Environmental Science, Policy and Management)
Pranab K. Bardhan (Economics)
Ruth Coller (Political Science)
Aline de Janvary (Agricultural and Resource Economics)
Lowell Dittmer (Agricultural Science)
Peter Evans (Sociology)
Louise Fortmann (Environmental Science, Policy, and Management)
Thomas B. Gold (Sociology)
Gillian Hart (Geography)
David Leondard (Political Science)
Thomas R. Metcalff (History)
Nancy Polan (Environmental Science, Policy, and Management)
Robert R. Reed (Geography)
Jeff Romm (Environmental Science, Policy, and Management)
Elisabeth Sadoulet (Agricultural and Resource Economics)
Michael J. Watts (Geography)

Program in Development Studies

Development Studies is the study of social transformation or change. DS students examine the problems, processes, and prospects for the development of human and material resources in what are generally thought to be the less developed areas of the world. The problems of development are urgent, massive, and enormously complex, and they transcend the boundaries of conventional academic disciplines. To study comparative development effectively, one must draw upon many disciplines and construct a balanced understanding of historical and contemporary processes. Thus, studying development as a social 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 course work focusing on (1) a discipline, (2) a geographic or thematic area, and (3) methodological skills appropriate to the student’s primary disciplinary interest. In organizing an undergraduate plan of study, students are aided by staff advisers in the International and Area Studies Teaching Program Office, the DS chair, participating faculty members from several departments and programs, and teaching associates working in the program.

The Program in Development Studies was established under the auspices of the Institute of International Studies and is a group major in the College of Letters and Science. Students participating in the program follow a plan of study organized as an interdisciplinary group major leading to a Bachelor of Arts degree in development studies.

The Group Major

Declaring a major in development studies follows guidelines established by the College of Letters and Science. Students wishing to declare a group major in development studies (1) must have completed at least 30 semester units of university work before applying, (2) must have completed at least two of the five lower division requirements, (3) must have completed at least two semesters of college-level foreign language or the equivalent, and (4) must have completed the major no later than the semester in which they complete the 61st unit. Junior transfer students should contact the Teaching Program Office concerning their eligibility.

Students are reminded that (1) no course work 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.

Minor. There is no minor program in development studies.

Double Majors. Double majors must be approved by the dean of the College of Letters and Science and cannot use more than two upper division courses to satisfy requirements in both majors.

Courses Outside the College of Letters and Science. No more than three courses outside the College of Letters and Science may be used to fulfill group major requirements.

Honors Program. To graduate with honors in Development Studies, students must enroll in the two-semester honors seminar, IAS 102 and DS H195, and must obtain grade-point averages of 3.3 in both the major and overall University course work by the time they complete their undergraduate degrees. The honors seminar is taken in addition to students’ regular course work for fulfilling requirements for the major and culminates in the writing of a senior thesis. The thesis is read by the thesis 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 may be checked in the Teaching Program Office.

Senior Program. This is an optional program within the major which encourages students to pursue systematically an advanced research project through seminars specifically focused on development topics. DS 194 and 150 are seminar and special topics courses taught by Development Studies faculty. Other course work in this category may be approved by a faculty adviser.

Course Plan

There is considerable flexibility within DS for students to construct an individual program unique to their specific intellectual and geographic interests. There is, however, a structure built into the major and minimal course requirements that must be met. This structure is designed to provide all DS students with a common knowledge base and intellectual reference points.

The program begins with lower division courses centered around DS 10, Introduction to Development Studies, which provides a basic factual, 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 arranged to meet disciplinary, developmental, and methodological requirements; and three area courses. The area courses should focus on a geographic region (Latin America, South Asia, Northeast Asia, Africa, etc.) and provide a working knowledge of the culture, history, and political economy of a region in the developing world. Area courses can alternatively focus on a theme such as health and development or the environment and development. Students may elect to enroll in the Honors Program or in the Senior Program (both described above).

Foreign Language Requirement

All DS students must be able to demonstrate proficiency in any single modern language (other than English) equivalent to four college-level semesters. Two semesters must be completed at any time before admission to the major.

There are three ways students can fulfill the four-semester language requirement, depending on their backgrounds and abilities:

1. Through course work. Any combination of high school courses, college courses, summer programs, 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, or third levels of language may be taken on a Pass/No Pass 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. However, transcripts must be provided and evaluated by an adviser. For more information, see a DS 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 departments offer proficiency exams. See a DS adviser about specific special instructions. Another option for those with advanced language ability is to place into a language course beyond the fourth semester and obtain an instructor’s note to that effect.

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 of high school.

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 with appropriate upper-class divisions with prior consent from a faculty adviser. Several options are listed below. Consult the Teaching Program Office for information on current acceptable substitutions.

Required Courses. Anthropology 3, Introduction to Social and Cultural Anthropology; Development Studies 10, Introduction to Development Studies; Economics 1, Introduction to Economics; Political Science 1; Political Science 139B or 144, Introduction to Comparative Politics; Statistics 2, Introduction to Statistics, or Statistics 20, Introduction to Probability and Statistics.

Note: With prior written consent from a faculty adviser, students may make the following substitutions: Anthropology 3: Anthropology 17 or 144; Economics 1: Environmental Economics and Policy 1; Political Science 2: Political Science 139B or 139C.

Upper Division Requirements

No less than 30 units in upper division courses, including five core courses, a minimum of one course in research methods, and a minimum of three upper division area courses. In fulfilling the major requirements outlined above, students should choose course work from at least two different disciplines in addition to the required course work in development studies. Specifically, the requirements are as follows:

I. Core Courses

Minimum of five courses. Development Studies 100 is required; plus a minimum of two courses from section B and a minimum of two courses from...
section C. The core courses are meant to provide a systematic background for students in two critical domains: (1) a discipline of their choosing 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) through two courses which provide critical concepts and methods for the study of developing countries. Course selections listed in section B provide numerous options. In addition, each student should choose a minimum of two development-focused courses from section C. These courses address a variety of historical, cultural, and political-economic concerns in the developing world and supplement the core disciplinary courses.

A. Development Studies 100, History of Development and Underdevelopment.

B. Disciplinary Courses: Minimum of two courses selected from the following list. Both courses should be from the same discipline.

- Anthropology: 114, 141, 144, 147A, 148, 169B.
- Economics: 100A and 100B; or 101A and 101B; 109.
- Geography: 110, 130.
- History: 101, 103.
- Political Economy: Economics 109; Geography 110; PEIS 100, 101; Political Science 115C, 126A, 125B.

C. Development Courses: Minimum of two courses selected from the following list.

- African American Studies: 112A, 112B.
- Anthropology: 115, 144, 145, 153, 156B, 157, 158, 189.
- Business Administration: 188.
- City and Regional Planning: 110, 111, 115, 116.
- Demography: 100.
- Development Studies: 130, 140, 150, 194
- Energy and Resources: 100, 151.
- Environmental Science, Policy, and Management: 163, 165, 166, 167.
- Ethnic Studies: 190.*
- Interdepartmental Studies (IDS): 290.
- Political Science: 121A, 139B, 139C, 182, 208.
- Public Health: 106, 114, C207B, 212C, 212D, 222.
- Rhetoric: 150, 155.
- Social Welfare: 100.

*Requires prior approval.

II. Methodology

Minimum of one course. The methodology requirement is designed to give each DS major a set of methodological skills appropriate to the disciplinary and core focus of each student's program. The methods course can be drawn from any of two broad categories and the selection of the most appropriate class for each student should be undertaken in close consultation with an adviser.

The first category focuses on advanced statistical methods and computer-assisted data analysis, building upon the skills acquired in the lower division statistics requirement. The second category focuses on research design and field methods. It is oriented to questions of survey design, field analysis, qualitative methods, and approaches to research design. One course should be selected from either of the following lists. A second course is strongly recommended.

**Statistical Methods: **Demography 110; Economics 141; Environmental Economics and Policy 118; Industrial Engineering and Operations Research 162, 171, 180; Political Science 132A-132B; Statistics 131A.

**Note:** (1) Students wishing to complete the research methods in the Department of Economics must also take Economics 100A-100B (Economic Analysis) and Statistics 2 before enrolling in Economics 141. (2) Political Science 132A-132B are sequential courses. Grade and credit are awarded upon completion of both courses.

**Research Design:** Anthropology 169B; City and Regional Planning 204B; Ethnic Studies 195; *IAS 102; Political Science 136B; Public Health 143; Sociology 105, 106.*

*Requires prior written approval from a faculty adviser.

III. Area Courses

Minimum of three courses, selected in consultation with an adviser. Students must focus on a geographic area building up a substantive expertise in the cultural, political, economic, and historical development of one particular part of the developing world. Students are encouraged to take courses from more than one discipline.

**Area Course List.** The following list of area courses is not exhaustive, but merely represents courses that have been officially approved by the College of Letters and Science for use in the development studies major. It is possible that you will discover new courses in departments which, depending on the instructor, may have a strong area focus and are relevant to your own program and interests in development studies. Similarly, some of the development courses (Section C) may have strong regional biases and hence may be used as regional or area requirements. For these reasons, please discuss your choice of area courses with your adviser.

- African American Studies: 131, 135.
- Anthropology: 170, 171, 176, 177, 178, 180, 181, 183, 184, 186, 187, 188*
- Asian American Studies: 125, 130.
- Chicano Studies: C161.
- City and Regional Planning: 270.
- Development Studies: 130, 140, 150.
- Economics: 113, 131, 155, 161, 162.
- Environmental Science, Policy, and Management: 155.
- Geography: 154, 156, 158, 162, 163, 165, 167.
- International and Area Studies 120, 130, 140, 142, 150.
- Latin American Studies: 130, 140, 150.
- Middle Eastern Studies: 130, 140, 150.
- Sociology: 183.

*Requires prior approval.

### Recommended Courses (Lower and Upper Division)

Listed below are classes which development studies majors have found particularly relevant and helpful in providing an interdisciplinary approach to the study of international development, questions of comparative development, and in providing a basic introduction for methodology courses:


#### Lower Division Courses

- **C10. Introduction to Development.** Three hours of lecture and one hour of discussion per week. This course is designed as an introduction to comparative development. The course will be a general service course, as well as a prerequisite for the upper division 100 series. It is assumed that students enrolled in this course have little to no knowledge about life in the Third World countries and are unfamiliar with the relevant theory in political economy of development and underdevelopment. The course will be structured around three critical concepts: land, labor, and work. Also listed as Geography C32.

#### Upper Division Courses

- **C100. History of Development and Underdevelopment.** Three hours of lecture and one hour of discussion per week. This course provides a historical overview of the development of world economic systems and the impact of these developments on less advanced countries. Course objective is to provide a background against which to understand and assess theoretical interpretations of development and underdevelopment. Also listed as Geography C112.

- **130. Cross-Listed Topics.** (1-4) Course may be repeated for credit. One to four hours of lecture per week. Prerequisites: Consent of instructor. The course is designed to accommodate cross-listed courses offered through other departments, the content of which is applicable to Development Studies majors. Content and unit values vary from one semester to another. (F,SP)

- **140. Special Topics.** (2) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. A short course designed to provide a vehicle to attract short-term visitors coming to campus who have considerable expertise in areas of interest to Development Studies. Topics will vary semester to semester. (F,SP)

- **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. Prerequisites: Consent of instructor. The course is designed to introduce students to 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)

- **192. Senior Thesis.** (3) 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 development topic. The project should be a minimum of 25-30 pages in length. The student and faculty sponsor should agree upon the topic in advance. (F,SP)

- **194. Seminar in Development Studies.** (4) Four hours of seminar per week. This course will provide students of development with an opportunity to synthesize widely dispersed material in a variety of disciplines as well as enable them to cover certain aspects of development not available in other departments. A major paper on a topic of special interest to individuals will be required of all participants. (SP) Staff

- **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.
Dramatic Art/Center for Theater Arts
(College of Letters and Science)
(See Theater, Dance, and Performance Studies)

Dutch Studies
(College of Letters and Science)

Group Major Office: 5321 Dwinelle Hall, (510) 642-7445
http://socrates.berkeley.edu/~h german/dutch.html

Professors
Jan de Vries, Ph.D. (History)
Thomas P. Shannon, Ph.D. (German)
Johan H. Snapper, Ph.D. (German, Queen Beatris Professor)
Blake Lee Sphar, Ph.D. (German, Comparative Literature) (Emeritus)
J. Frits Staal, Ph.D. (South and Southeast Asian Studies) (Emeritus)

Associate Professors
Elisabeth Honig, Ph.D. (History of Art)
Sylvia C. Twien, Ph.D. (South and Southeast Asian Studies)

Lecturer
Neiolve van Deussen-Scholl, Ph.D. (Dutch Studies and Afrikaans)

Peter Paul Rubens Professors
Hugo Baxters Beardsmore, Ph.D. (Brussels, 1988)
Herman Boert, Ph.D. (Ghent, 1996)
Els de Bens, Ph.D. (Ghent, 1993)
Ferdinand J. de Hen, Ph.D. (Ghent, 1987)
Marc de Mey, Ph.D. (Ghent 1997)
Regina de Schryver, Ph.D. (Leuven, 1982)
Dina Helleman, Ph.D. (Brussels, 1992)
Marcel Janssens, Ph.D. (Leuven, 1986)
Clem. Louis Neutjes, Ph.D. (Antwerp, 1995)
Herman Parret, Ph.D. (Antwerp, 1991)
Walter Preyen, Ph.D. (Ghent, 1983)
Eugene Roozenga, Ph.D. (Leuven, 1990)
Hilde Symons-de Ridder, Ph.D. (Ghent 1998)
Carlos Tindemans, Ph.D. (Antwerp, 1985)
Herman van den Weyenbergh, Ph.D. (1984)
Adriaan E. Verplanck, Ph.D. (Ghent, 1989)
Rolfen Willemsen, Ph.D. (Brussels, 1984)

Group Major in Dutch Studies

The group major in Dutch studies is designed to present a balanced curriculum of the language, literature, history, and culture of The Netherlands and Flanders. Since the program is both specialized (in dealing with two countries) and broad (in its many-sided approach to the subject), it is recom- mended that the student also prepare a strong re-

Literature courses: 6 units in either the Dutch 140 or 160 series (which may be repeated as topics change) or Dutch 180.

Culture courses: Dutch 170, Dutch 177, or one his-
tory of art course (166, 172, 173).

Senior Thesis: Dutch 190.

Additional courses to be selected from the follow-
ing list to complete the major (see Department of German for complete description of these courses): Dutch 140, 160 series, 165, Afrikaans 150, History 163, 170; Comparative Literature 170; Music 129.

Majors in Dutch Studies who are enrolled in Dutch 160 series courses are expected to read the liter-
atuere in the original language.

Honors Program. Students accepted in the hon-
or program will enroll in Dutch H196 (1-4 units) for a total of 4 units and will be expected to write a se-
nior thesis (Dutch 190) with distinction.

For additional information, consult the adviser for the group major in Dutch studies, 5329 Dwinelle Hall.

The Minor

Required courses: Five upper division courses: (1) Dutch 110, 125 (may be repeated for credit), 170; (2) additional upper division courses from the following: Dutch 107, 140, 160, 161, 162, 163, 164, 165, 167, 180; Afrikaans 150.

A letter grade of C or better is required fore-
achupper division course applied to the minor.

Dutch studies courses listed in the German section of this catalog (following German graduate course listings).

Earth and Planetary Science
(College of Letters and Science)

Department Office: 307 McCone Hall 84767, (510) 642-3993
http://www.seismo.berkeley.edu/geology/

Chair: William E. Dietrich, Ph.D.

Professors
Walter Alvarez, Ph.D. Princeton University. Stratigraphy, earth history, impactology, meteoritical and mass extinctions.
William B. N. Berry, Ph.D. Yale University. Climate change, environmental issues, distinction patterns.
George H. Brinkmull, Jr., Ph.D. University of California, Berkeley. Mineral resources, geochemistry of sulfuric ore formation, field geology.
Mark T. Bokowski, Ph.D. University of California at Los Angeles. Physics of planetary interiors.
Ian S. E. Carmichael, Ph.D. Imperial College of Science and Technology, University of London. Igneous and experimental petrology.
Imre de Pater, Ph.D. University of California. Planetary astronomy: infrared imaging (spectral, AO) and spectroscopy of solar system bodies, radio observations (mm wavelengths, centimeter-meters wavelengths) of planets, satellites, comets. Atmospheres, magnetospheres, and surfaces.
Donald J. DePatio, Ph.D. California Institute of Technology. Isotope geophysics.
Inez Y. Fu, Sc.D. Massachusetts Institute of Technology. Geophysical fluid dynamics, numerical modeling.

based on the prospectus developed in International and Area Studies 102. The thesis work is reviewed by the honors instructor and a second reader to be se-
lected based on the thesis topic. Weekly progress re-

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 expe-
rience relevant to specific aspects of Development Studies in off-campus organizations. Regular individ-
ual meetings with faculty sponsor and written reports required. (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 pro-
posal must be approved by a faculty advisor. Enroll-
ment is restricted by regulations of the College. (F,SP)
Major in Earth and Planetary Science

The Department of Earth and Planetary Science offers one undergraduate major leading to a B.A. degree in Earth and Planetary Science. There are five tracks within the EPS degree-geology, geophysics, environmental earth science, atmospheric science, and marine science. Students in the old geology, geophysics, and earth science majors should consult with 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 P/NP 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.

Geology Track

Geology is the science of the earth--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 those involving mineral resources, and environmental protection. This track provides strong background in the processes shaping the earth; it emphasizes quantitative understanding and a strong foundation in the physical sciences.

Lower Division:
- Math 1A-1B, Physics 7A-7B, Chem 1A-1B, EPS 50 and 60

Upper Division:
- EPS 100A, 100B, 101, 102, 118, 150 plus 6 additional upper division units (see department or web site at: www.seismo.berkeley.edu/geology for a list of electives)

Geophysics Track

The Geophysics track is designed to provide students with the 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 ability. It provides a solid background in physical science and mathematics with an emphasis on the physics of the Earth.

Lower Division:
- Math 1A-1B, Math 53, 54, Physics 7A-7B-7C, Chem 1A-1B, EPS 50

Upper Division:
- EPS 102, 104, 121, 150 plus 6 additional upper division units (see department or web site at: www.seismo.berkeley.edu/geology for a list of electives)

Environmental Earth Science Track

The Environmental Earth Science track 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 track focuses more broadly on the natural sciences by using earth science mainly as a base for expanding outwards to the 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 broader involvement in land use planning, business, policy, law or management.

Lower Division:
- Math 1A-1B (or 16A-16B), Physics 7A-7B (or 8A-8B), Chem 1A-1B (or 3A), Biology 1B, EPS 50

Upper Division:
- EPS 102, 117, 120, 120L, 150, ERG 102 plus 10-12 additional upper division units (see department or web site at: www.seismo.berkeley.edu/geology for a list of electives)

Atmospheric Science Track

This course of study is a new undergraduate program (http://www.atmos.berkeley.edu). Exploring the fundamental natural processes controlling atmospheric composition, circulation dynamics, and climate, and understanding how these processes have changed in the past and may change in the future are among the greatest intellectual and technological challenges of our time. Topics covered will include the physics of climate variability and climate change, changes in stratospheric ozone, coupling of atmospheric chemistry and climate, changes in the oxidation capacity of the troposphere, smog, and the impacts of atmosphere-biosphere exchange on atmospheric composition.

Lower Division:
- Math 1A-1B, Math 53, 54, Physics 7A-7B-7C, Chem 1A-1B, EPS 50

Upper Division:
- EPS 102, 150, C180, 181, 182 plus 5 additional upper division units (see department or web site at: www.seismo.berkeley.edu/geology for a list of electives)

Geophysics Track

The Geophysics track is designed to provide students with the 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 ability. It provides a solid background in physical science and mathematics with an emphasis on the physics of the Earth.

Lower Division:
- Math 1A-1B, Math 53, 54, Physics 7A-7B-7C, Chem 1A-1B, EPS 50

Upper Division:
- EPS 102, 104, 121, 150 plus 6 additional upper division units (see department or web site at: www.seismo.berkeley.edu/geology for a list of electives)

Environmental Earth Science Track

The Environmental Earth Science track 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 track focuses more broadly on the natural sciences by using earth science mainly as a base for expanding outwards to the 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 broader involvement in land use planning, business, policy, law or management.

Lower Division:
- Math 1A-1B (or 16A-16B), Physics 7A-7B (or 8A-8B), Chem 1A-1B (or 3A), Biology 1B, EPS 50, IB 82

Upper Division:
- EPS 102, 150 and four courses from the following: EPS 100A, 100B, 103/203, 115, C146, IB 106, IB 106A plus 4-6 additional upper division units (see department or web site at: www.seismo.berkeley.edu/geology for a list of electives)

Minor in Earth and Planetary Science

Lower Division:
- Earth and Planetary Science 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 which parallels the department's major tracks or a general interest track. Course selections will be guided by the same parameters as those in the major tracks with an option of a general interest track. 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.

Graduate Programs

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 creative thinking and develop the capacity for independent and original work in general or in specific areas. The student develops a broad graduate 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 courses) followed by a comprehensive oral examination. The Master of Science degree is granted upon completion of 20 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 end of the second year and complete a thesis to the satisfaction of the appointed thesis committee. Students must have two research propositions to present at the qualifying examination, each developed under the supervision of a different professor on substantially different topics.

Research Facilities

Center for Isotope Geochemistry, under the directorship of Professor Donald DePaolo, consists of solid-source mass spectrometry and clean chemistry laboratories on campus, and facilities for stable isotopic measurements, rare gas isotope measurements, and cosmogenic isotope measurements at Lawrence Berkeley Laboratory. Research using the Nd, Sr, Pb, Ca, O, H, C, He, Ne, Be, and AI isotopes is directed toward studies of geological and hydrological processes and the structure and evolution of the oceans, the mantle, and the continental crust.

The Earth Resources Center (http://socrates.berkeley.edu/~earthres/), under the directorship of Professor George Brimhall with faculty from eight campus departments, conducts interdisciplinary research and education on the genesis, geochronology, discovery, production, and environmental consequences of development of nonrenewable earth resources of minerals and fuels. The focus on the center is in developing an understanding of the underlying geological, physical, and chemical processes that affect the origin, age, emplacement, and economic recovery of minerals and hydrocarbons in the context of minimizing the environmental impact of the use of these resources. Digital mapping using portable computers, GPS, laser range finders, infrared spectrometers and remote sensing is a central focus of the field work in the ERC directed at exploration, development and cleanup of abandoned mining properties. The center encourages an integrated understanding of earth resources useful in improving the rate of discovery of environmentally friendly ores and fuel, enhancing treatment of conventional ores to minimize pollution and waste, developing useful by-products, and improving the long-term managed development of resources including their water, air and soil quality.

The Center for Atmospheric Sciences (http://www.atmos.berkeley.edu), a new multidisciplinary academic group at Berkeley. It focuses on the processes that maintain and alter the atmo
sphere's chemical composition and circulation. It also examines the climatic effects of changes in these processes. A special emphasis is the interaction between biogeochemical cycling and climate, with the atmosphere as the synthesizer of changes at its boundaries, and the communicator of these changes to the other spheres. Center members and associates are from the Department of Earth and Planetary Science, Department of Chemistry, Department of Environmental Sciences, Policy & Management, Department of Mechanical Engineering and Space Sciences Laboratory, Lawrence Berkeley National Laboratory, among others. Research approaches are multi-faceted, and include: global three-dimensional circulation models, climate modeling, high-performance instrumentation for atmospheric chemistry, aircraft measurements of stratospheric-tropospheric exchange, measurements and simulations of atmospheric models, exchange of trace gases, and geological study.

Berkeley Geodynamics Group (http://socrates.berkeley.edu/~geodynamics) is a facility for modeling propagation through complex structures, the nature of earthquake related data in northern California. Related by the lab, as well as an online archive for continuous telemetry to UC Berkeley forms the works of geophysical instruments in northern California. Berkeley.edu) The University operates several networks of geophysical technology developed for use in shallow subsurface regions can also be used as an aid to geoarchaeological searches. The technology is also expected to play a key role in solving contemporary problems associated with the detection and removal of buried explosive ordnance.

Lower Division Courses


4. 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 constrain present day thinking about (and predictive models of) future climate change. We will cover the entire spectrum of climate variations, from the formation of the Earth's early atmosphere 4.6 billion years ago to the ice ages to the development of instrumental records.

C12. The Planets. (3) Three hours of lecture per week. Formerly Geology 12. A tour of planets and moons of the solar system, and an introduction to their internal structures, atmospheres, and surface features. Processes that form planets and act continually to change them (e.g., earthquakes, volcanoes, giant impacts) are discussed, as are comets, asteroids, rings, and life. Information gained from recent spacecraft missions is highlighted. Intended for non-science majors. Also listed as Astronomy C12.

20. Earthquakes. (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, measurement of earthquakes, and earthquake hazard and risk, with particular emphasis on the situation in California.

24. Freshman Seminar in Earth and Planetary Sciences. (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. Formerly Geology 24. The freshman seminar in earth and planetary science is designed to provide new students with an opportunity to explore and consider career opportunities in earth and space sciences with a faculty member in a small seminar setting. Topics will vary from semester to semester but will include such possible topics as great voyages of geologic discovery 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 passed/not passed basis. Prerequisites: Priorly given to freshmen and sophomores. Formerly Geology 39. Freshmen and sophomore seminar for 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 academic departments; topics change from year to year.

50. The Planet Earth. (4) Three hours of lecture and three hours of laboratory per week. Formerly Geology 50. An introduction to the physical and chemical processes that have shaped the earth through time, with emphasis on the theory of plate tectonics. Laboratory work will involve the practical study of minerals, rocks, and geologic maps and exercises on geological processes.

60. Quantitative Analysis of Earth Sciences. (4) Three hours of lecture and one hour of discussion per week. Formerly Geology 60. Introduction to quantitative description of geological processes. Topics include rate processes, descriptions of three dimensional geological fields like gravity, temperature, velocity; conservation equations; deformation; plate kinematics; geologic time series; multiple chemical equilibria.

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 will consider processes active on the earth and man's interactions with them. Geologic aspects of use of the land and oceans based on an understanding of earth's environmental processes.

98. Directed Group Study. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Formerly Geology and Geophysics 98. Group studies of selected topics which vary from semester to semester.

Upper Division Courses

100A. Minerals: Their Constitution and Origin. (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: Some background in chemistry and physics. Formerly Geology 100A. Introduction to structural, compositional, and physical properties of minerals, their analogs and related substances, their genesis in various geologic and synthetic processes, and laboratory techniques to identify and investigate minerals. One field trip to selected mineral deposits and visits to laboratories.

100B. Genesis and Interpretation of Rocks. (4) Two hours of lecture and four hours of laboratory per week, plus one weekend field trip. Prerequisites: 100A. Formerly Geology 100B. Introduction to the principal rock types, their formation, and the processes that formed them, as well as their use as a tool for understanding Earth's history asrecorded and displayed. Igneous, sedimentary, and metamorphic processes discussed in the context of global tectonics.

101. Field Geology and Digital Mapping. (4) Seven hours of field work and two hours of lecture per week, and additional field trips. Prerequisites: 50 or equivalent introductory course in Earth and Planetary Science. Formerly Geology 101. 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 Coast Ranges and California as a whole through field trips to key localities. Training in digital field mapping, geological position-
103. Introduction to Marine Geochemistry. (3) Three hours of lecture per week. Prerequisites: 50, Chemistry 1A-1B, Mathematics 1A-1B, and Physics 7A. Introduction to marine geochemistry: the global water cycle; major processes governing the distribution of chemical species within the hydrosphere; mass balances, fluxes, and reactions in the marine environment from global to submicron scales; relationships to physical, biological, and geologic processes; geochemical tracers and tools.

104. Mathematical Methods in Geophysics. (4) Three hours of lecture and one hour of computer laboratory per week. Prerequisite: Mathematics 53-54. Formerly Geophysics 104. Linear systems. Linear inverse problems, least squares; generalized inverse, resolution; Fourier series, integral transforms; time series analysis; spectral analysis; partial differential equations of geophysics; functions of a complex variable; probability and significance tests, maximum like-likelihood methods. Intended for students in geophysics and other physical sciences.

105. Hydrogeology. (3) Three hours of lecture per week. Prerequisites: Math 1A-1B, Physics 7A, Chem- istry 1A-1B; 60 or Math 53 is recommended. Formerly Geology 105. An overview of the principles governing fluid flow in the earth's crust, interaction of geologic processes and fluid flow, transport of energy and solutes, migration of hydrocarbons and contaminants, and waste isolation.

106. Mineral Resources. (4) Three hours of lecture and three hours of laboratory per week and two field trips. Prerequisites: 10 or 50 or equivalent and Chemistry 1A-1B and consent of instructor. Formerly Geology 106. Behavior of metals in the earth; survey of ore-forming crustal environments and processes; temporal and geographic distribution of mineral resources; re- gional and commercial significance of resources; introduction to mineral exploration; metals in the environment and fac- tors governing resource management and policy.


108. Geodynamics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 60, Physics 7A, and Mathematics 53, 54. Formerly Geophysics 108. Basic principles in studying the physical processes that control the materials and the dynamic pro- cesses of the earth. Examples are drawn from tec- tonics, mechanics of earthquakes, etc., to augment course material.


seismic velocity are interpreted to map the subsurface distribution of density, magnetic susceptibility, electrical conductivity, and mechanical properties. Also listed as Civil and Environmental Engineering C178.

181. Atmospheric Physics and Dynamics. (3) Three hours of lecture/discussion per week. Prerequisites: Mathematics 53, 54; Physics 7A-7B-7C. Formerly Geology 144. This course examines the processes that determine the structure and circulation of the Earth’s atmosphere and oceanic circulation rather than descriptive to figure out the properties and behavior of the Earth’s atmosphere 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 energy balance; geophysical fluid dynamics; stability; and instabilities of extratropical cyclones.

182. Laboratory and Numerical Methods in Atmospheric Science. (3) One hour of lecture and five hours of laboratory per week. Prerequisites: Chemistry 1A-1B, Math 1A-1B, Physics 7A-7C, or equivalents. Fluid dynamics, radiative transfer, and the kinetics, spectroscopy, and measurement of atmospherically relevant species are explored through laboratory experiments and computational exercises. The course is intended for earth and planetary science majors and minors, or for chemistry, physics, astronomy, biology, and engineering majors whose interests may allow them to apply to the atmosphere of the Earth and other planets.

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. Original research and preparation of an acceptable thesis. May be taken during two consecutive semesters of senior year and may be substituted for six units of the upper division requirement with consent of major advisor.

196. Directed Group Study. (1-4) Course may be repeated for credit. Must be taken on a pass/not pass basis. Formerly Geology 196. 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 pass/not pass basis. Formerly Geology 199. Enrollment is restricted by regulations.

Graduate Courses

200. Problems in Hydrogeology. (4) Three hours of lecture per week. Geology 190, Chemistry 1A-1B, Math 1A-1B, Physics 7A-7C, or consent of instructor. Problems in Natural Processes. (3)

204. Elastic Wave Propagation. (3) Three hours of lecture per week. Prerequisites: 104 or equivalent; 121; Physics 105. Formerly Geophysics 204. Wave propagation in elastic solids; effects of anelasticity and anisotropy; representation theorems; reflection and refraction; propagation in layered media; finite-difference and finite-element methods. Formerly Geophysics 205. Advanced treatment of the generation and propagation of elastic waves in the Earth. Lamb’s problem; waves in inhomogeneous media; eigenvalues; seismic source models; synthetic seismograms.

205. Theoretical Seismology. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 204 or consent of instructor. Formerly Geophysics 205. Advanced treatment of the generation and propagation of elastic waves in the Earth. Lamb’s problem; waves in inhomogeneous media; eigenvalues; seismic source models; synthetic seismograms.


207. Laboratory in Observational Seismology. (3) Three hours of lecture and one hour of discussion 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 data. Recent advances in data processing. Application of current observations to develop techniques and field methods in seismological research.

208. Mechanical Properties of Earth Materials. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: EPS 108 (Formerly Geophysics 108) or course in continuum mechanics. Formerly Geophysics 208. Mechanical properties of rocks and minerals. Finite deformation and thermodynamics of solids under strain. Elasticity, anelasticity, high-temperature creep, and fracture of rocks. Properties of polycrystals and aggregates; the nature of grain boundaries, dislocations and other crystal defects and microstructures.

209. Mineral Thermodynamics. (3) Three hours of lecture and one hour of discussion per week. Formerly Geophysics 209. Physical basis of the thermodynamic properties of minerals and rocks; studies of enthalpy, entropy, and volume at the atomic level. Effects of pressure, temperature, and water on the stability of minerals and rocks. Critical review of modern phase relations with applications to geodynamic problems.

210. Advanced Ore Petrology. (3) Course may be repeated for credit. Three hours of lecture and three hours of laboratory per week plus one field trip. Prerequisites: 100A-100B, 106 and 131. Formerly Geology 210. Advanced study of mineralogy and geochemistry of ore deposits and ore bodies. Theoretical and experimental approaches.

211. Advanced Digital Mapping and Surveying for Scientists, Engineers and Planners. (2) One and one-half hours of lecture and one and one-half hours of laboratory/discussion per week for eight weeks. Prerequisites: Consent of instructor. Formerly Geology 206. Research and mapping and surveying applications for scientists, engineers, and planners. Overview and application of digital geomatics consisting of portable pen-based computers, global positioning systems, and laser range finders. Development of specific digital mapping and surveying applications for individual students. Consists of online instruction and one on-site field project. The examination will consist of an oral presentation and a written report. The examination will consist of an oral presentation and a written report. The examination will consist of an oral presentation and a written report. The examination will consist of an oral presentation and a written report. The examination will consist of an oral presentation and a written report.

212. Advanced Stratigraphy and Tectonics. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Formerly Geology 212. Advanced study of the structure and tectonics of the Earth's crust and upper mantle, including the processes of plate tectonics. Advanced study of the structure and tectonics of the Earth's crust and upper mantle, including the processes of plate tectonics. Advanced study of the structure and tectonics of the Earth's crust and upper mantle, including the processes of plate tectonics. Advanced study of the structure and tectonics of the Earth's crust and upper mantle, including the processes of plate tectonics. Advanced study of the structure and tectonics of the Earth's crust and upper mantle, including the processes of plate tectonics.
234. Single and Polycrystal Analysis. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. Formerly Geology 224. Discussion of selected topics in structural features of single and polycrystals with emphasis on minerals and rocks. Study of phase transformations and deformation processes. Topics vary from year to year.

235. Characterization of Minerals and Rocks. (4) Two hours of lecture, three hours of laboratory, and one hour of discussion per week. Formerly Geology 235. Introduction to the main methods of characterization such as optical microscopy, x-ray diffraction, x-ray fluorescence, and electron microscopy. Interpretation of data in a geologic context. Advanced undergraduates are encouraged to attend.

236. Geological Fluid Mechanics. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Consent of instructor. Formerly Geophysics 238. An advanced course in the application of fluid mechanics in the earth sciences, with emphasis on the design of geologic and numerical models. Principals of inviscid and viscous fluid flow; dynamic similarity; boundary layers; convection; instability; gravity currents; mixing and chaos; porous flow. Applications include convection, magneto-hydroynamics, atmosphere and ocean dynamics, sediment/debris flows, and hydrogeology. Topics vary from year to year.

240. Watershed Hydrology and Biogeochemistry. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Geology 420. Advanced topics in watershed hydrology, geochemistry, and biogeochemistry, with emphasis on methods for predicting streamflow, sediment yield, and runoff chemistry at watershed scale. Top-down and bottom-up approaches in watershed modeling; validating and testing watershed models. Effects of land use and atmospheric pollution on water quality in lakes and streams, illustrated with data from experimental watersheds in North America, Scandinavia, and Europe.

C241. Geochemical Approaches to Modern and Past Environments and Climates. (4) Course may be repeated for credit. Three hours of seminar per week. Formerly Geology C241. Research seminar graduate course on the use of geochemical methods and approaches in paleoenvironmental/paleoclimatic reconstruction, and in modern environmental studies. Discussion of modern processes that are a key element to understanding past environmental changes. Methods to be covered include stable and radiogenic isotopes, trace element distributions, and organic geochemistry.

C242. 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, terrestrial and temperate, global flow, and response of ice sheets and glaciers. We will use this knowledge to examine glaciers as geomorphic agents and as participants in climate change. Also listed as Geography C241.

C249. Solar System Astrophysics. (3) Three hours of lecture per week. Prerequisites: Astronomy 149, 169, C160A or consent of instructor. The physical foundations of solar system astronomy. Topics include the solar nebula and modern observations of disks. Formation of the planets, planetary interiors and surfaces, planetary atmospheres and magnetospheres, and smaller bodies in the solar system. The physical processes and products of space weather developed in some detail, and an evolutionary picture for each class of objects is expounded. Some discussion of other (potential) planetary systems is also included. Also listed as Astronomy C249.

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 at the interface 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 unresolved 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 carbon storage on land and in the sea? Emphasis will be placed on the observations and modeling needed to evaluate hypotheses about carbon sources and sinks. Past records will be examined for clues about sensitivity of carbon processes to climate variations.

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 of the following advanced topics in seismology and geophysics, including local crustal and earthquake studies, regional tectonics, structure of the earth's mantle, and core and global dynamics.

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. Tectonic regions as well as sources of the events. 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 Geology 260. Weekly presentations to introduce new graduate students and senior undergraduates to current research conducted in the Department of Earth and Planetary Science.

264. Sedimentary Rocks and Processes. (3) Course may be repeated for credit. Three hours of seminar per week. Formerly Geology 264. Discussion of paleoenvironmental, paleoecological, and palaeogeographic implications of fossils and sedimentary rocks and processes of sedimentation. Focus varies from year to year.

280. Research. (2-12) Course may be repeated for credit. Formerly Geology 280. Individual conferences to be arranged. Provides supervision in the preparation of original research papers or dissertation. Course may be repeated for credit. Occasional group sections may be taken on letter-grade basis.

298. Directed Group Study for Graduates. (1-9) Course may be repeated for credit. Three hours of laboratory per week. Formerly Geology 298. Directed group study for advanced research in one of the following specialties: stratigraphy, structural geology, or igneous petrology. Course requires consent of instructor.

251. Carbon Cycle Dynamics. (3) Course may be repeated for credit. Eight hours of laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Geology 251. The carbon cycle is critical to understanding climate change. This course will provide an introduction to the carbon cycle, its evolution, and the processes that control its behavior. Topics will include: the role of carbon in the Earth's climate system, the natural variability of the carbon cycle, and the implications of human activities for the future of the carbon cycle.

254. Advanced Topics in Seismology and Geophysics. (1) Course may be repeated for credit. Three hours of lecture per week. Formerly Geophysics 254. Lectures on various advanced topics in seismology and geophysics, including local crustal and earthquake studies, regional tectonics, structure of the earth's mantle, and core and global dynamics.

256. Earthquake of the Week. (2) Course may be repeated for credit. Two hours of discussion per week. Formerly Geophysics 256. Each week, the seismicity of the previous week, in California and worldwide, is reviewed. Tectonic regions as well as sources of the events. 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 Geology 260. Weekly presentations to introduce new graduate students and senior undergraduates to current research conducted in the Department of Earth and Planetary Science.

264. Sedimentary Rocks and Processes. (3) Course may be repeated for credit. Three hours of seminar per week. Formerly Geology 264. Discussion of paleoenvironmental, paleoecological, and palaeogeographic implications of fossils and sedimentary rocks and processes of sedimentation. Focus varies from year to year.

280. Research. (2-12) Course may be repeated for credit. Formerly Geology 280. Individual conferences to be arranged. Provides supervision in the preparation of original research papers or dissertation. Course may be repeated for credit. Occasional group sections may be taken on letter-grade basis.

298. Directed Group Study for Graduates. (1-9) Course may be repeated for credit. Three hours of laboratory per week. Formerly Geology 298. Directed group study for advanced research in one of the following specialties: stratigraphy, structural geology, or igneous petrology. Course requires consent of instructor.

The Department of East Asian Languages and Cultures at Berkeley offers courses in Chinese, Japanese, Korean, and other languages and literatures of East Asia. Students select one language in the undergraduate major program: Chinese, Japanese, or Altai (currently suspended). Although the major in Altai is unavailable, students may still take courses in Korean language and literature. Students proceed from the acquisition of facility in the spoken language to a reading knowledge of both modern and classical forms of the language. Upper division courses stress the linguistic, literary, and cultural studies of East Asia.

Prerequisites: Completion of lower division courses and one semester of C181A, C181B, C183, or C188 (literature in translation)
Lower Division Chinese 1A-1B (5-5); Chinese 10A-10B (5-5); Chinese 2A-2B (4-4); Linguistics 5 (4). Linguistics 5 may be taken on a passed/not passed basis.

Upper Division Chinese 100A-100B (5-5); 4 units of Chinese Linguistics (C161, C163, C165, C167, or C169); 4 units of modern Chinese (C155, C156, or C157); 8 units of classical Chinese (chosen from among C120, C122, C130, C132, C134, C136, C138, C140, or C142).

Total units required: 52.

Japanese
Prerequisites: Completion of lower division courses and one semester of J182A or J182B (literature in translation).

Lower Division Japanese 1A-1B (5-5); Japanese 10A-10B (5-5); Linguistics 5 (4). Linguistics 5 may be taken on a passed/not passed basis.

Upper Division Japanese 100A-100B (5-5); Japanese 120 (4); 4 additional units of classical Chinese (J130, J132, J134, J140, J142, or J144); Japanese 162 (4); Japanese 182A-182B (4-4); 4 additional upper division units in modern Japanese literature (J155, J159).

Total units required: 58.

Honors Program
A senior undergraduate student who has completed 12 advanced language courses in the department, and who has a grade-point average 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 advisor. Upon completion of the program, a faculty committee will determine the degree of honors to be awarded (Honors, High Honors, Highest Honors), taking into consideration both the quality of the thesis and overall performance in the department. Honors will not be granted to a student who does not achieve a minimum cumulative grade-point average of 3.3 in all undergraduate work in the University.

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 elementary 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
Graduate Courses
200. Proseminar. Approaches to East Asian Studies. (4-4) Three hours of lecture per week. This course introduces theoretical approaches to East Asian studies with an emphasis on China and Japan. We will consider the historical role of philological research, area studies, and interdisciplinary scholarship, and will ask how knowledge is produced in our fields. The readings are designed to help interrogate the common sense of "civilization," "culture," "tradition," "identity," and so on, and to explore new ways of asking questions about text and context, historical narrative, gender, subjectivity, and regimes of knowledge. This course is also intended as a preliminary introduction to the state of the field in East Asia studies. (F)

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. (5,5) Five hours of lecture per week. Prerequisites: A is prerequisite to B. 1AX-1BX. Elementary Chinese for Mandarin Speakers. (3,3) Students will receive no credit for 1AX-1BX after passing 1, 1A-1B, or 5. Three hours of lecture per week. Prerequisites: Chinese 1AX is prerequisite to 1BX; consent of instructor. Elementary Chinese for students who speak Mandarin but who have minimal exposure to reading or writing.
2A-2B. Introduction to Classical Chinese. (4,4) Three hours of lecture per week. Prerequisites: 2A is prerequisite to 2B. Characters, radicals, grammar; easy readings in pre-Han, Han, Six dynasties, and Tang literature. 10A-10B. Intermediate Chinese. (5,5) Five hours of lecture per week. Prerequisites: 1B, 10A is prerequisite to 10B.
10AX-10BX. Intermediate Chinese for Mandarin Speakers. (3,3) Students will receive no credit for 10AX-10BX after passing 10 or 10A-10B. Three hours of lecture per week. Prerequisites: Chinese 10AX is prerequisite to 10BX; consent of instructor. Intermediate Chinese for students who speak Mandarin and have elementary-level knowledge of reading and writing in Chinese.
24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week for fifteen weeks or two hours of seminar per week for eight weeks. Sections 1 and 3 to be graded on a passed/not passed basis. Sections 2 and 4 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, and topics vary from department to department and semester to semester.
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 in a small-seminar setting. Freshman seminars are offered in all campus departments; topics vary from department to department and semester to semester.
60. The Story of the Stone. (4) Three hours of lecture per week. This course centers around intensive reading and analysis of Cao Xueqin’s 18th-century masterpiece of Chinese fiction, The Story of the Stone (also known as the Dream of the Red Chamber). Students will be introduced to the literary, cultural, philosophical, and material world from which this work emerged, as well as various approaches to the world within the text.
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.

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.

Upper Division Courses
100A-100B. Advanced Chinese. (5,5) Five hours of lecture per week. Prerequisites: 10B; 100A is prerequisite to 100B. Reading and discussion, in Chinese, of modern Chinese texts, literary, political, and general, in a variety of styles. Assignments to develop oral and writing skills.
100AX-100BX. Advanced Chinese for Mandarin Speakers. (3,3) Students will receive no credit in 100AX-100BX after passing 100, 100A-100B, or 110AX. Three hours of lecture per week. Prerequisites: Chinese 100BX; 100AX is prerequisite to C100BX; consent of instructor. Advanced Chinese for students who speak Mandarin and have intermediate-level knowledge of reading and writing. The goal of this course is to introduce modern Chinese society through reading materials and discussion. The reading materials include stories, essays, and plays, mostly by leading writers of recent decades.
101. Fourth-Year Readings—Literature. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100B or consent of instructor. This course is designed to elevate abilities in speaking, reading, listening, and writing. Students will read the works of famous Chinese writers. Movie adaptations of these writings are also used. Students’ writings will be circulated and students will act in plays they write.
102. Fourth-Year Readings: Social Sciences and History. (4) Course may be repeated for credit. Three hours of lecture per week. This course is designed to elevate abilities in speaking, reading, listening, and writing. Students will read the People’s Daily and other sources of social, political, and historical writings. Film documentaries will supplement the written materials. Students will circulate their works as part of the class requirements.
120. Ancient Chinese Prose. (4) Three hours of lecture per week. Prerequisites: 2A. Readings in historical, religious, and philosophical texts of the Zhou and Han periods from printed and manuscript sources.
122. Ancient Chinese Poetry. (4) Three hours of lecture per week. Prerequisites: 2A. Readings from the Shi and Shijing; poetic parts of the Ch’ü, Ch’ü, and Han dynasties.
132. Readings in Early Medieval Literature. (4) Three hours of lecture per week. Prerequisites: 2B and one upper division course in classical Chinese. A different theme or literary form will be studied each semester.
134. Readings in Later Medieval Poetry. (4) Three hours of lecture per week. Prerequisites: 2B. Analysis of semantic, structural, and sonorous aspects of poems (shi, ci, or gu) of the T’ang, Five Dynasties, and Sung periods, to reveal how their interplay makes “poetry.”
136. Readings in Late Medieval Prose. (4) Three hours of lecture per week. Prerequisites: 2B. Philosophical, grammatical, and literary analysis of prose texts from the Sung, Chin, and Yuan periods. Texts will include Ku-wen essays, historical works, funerary inscriptions and epitaphs, scholars’ notes (pi-chi), administrative documents including memorials and inscriptions, and writings on classical scholarship and thought.
136. Readings in Chinese Drama. (4) Three hours of lecture per week. Prerequisites: 100B or consent of instructor. Formerly Chinese 156 prior to Spring 1994. Yuan-Ming drama, readings at fourth-year level.
140. Readings in Chinese Buddhist Texts. (4) Three hours of lecture per week. Prerequisites: One upper-division classical Chinese course. Course content will vary according to student interests.

142. Chinese Bibliography and Research Method. (4) Three hours of lecture per week. Prerequisites: One upper-division classical Chinese course. Introduction to a range of research tools necessary for research on aspects of Chinese civilization, with an emphasis on the history and literature of the premodern period. Includes analysis of materials, problem sets, and extensive readings.

155. Readings in Vernacular Chinese Literature. (4) Three hours of lecture per week. Prerequisites: 100B. A critical study of pre-modern Chinese fiction.

157. Contemporary Chinese Literature. (4) Three hours of lecture per week. Prerequisites: 100B and upper-division literature course in any language. This course surveys modern Chinese literature from the May Fourth period through the 1940's. Course will examine the changing presence of literature in 20th century China in the larger context of Chinese revolution, nationalism, language reform, and the rise of Chinese Marxism.

158. History of the Chinese Language. (4) Three hours of lecture per week. Prerequisites: 100B and upper-division course in any language. This course surveys modern Chinese literature from the 1950's to the present. Topics include language and national identity, literature and politics, the rise of the transnational market economy, media and gender politics with special attention to the post-Mao and post-cold-war era.

161. Structure of the Chinese Language. (4) Three hours of lecture per week. Prerequisites: 100A, Linguistics 5 or 100. Writing system, early dictionaries, historical phonology, and classical grammar.

169. History of the Chinese Language. (4) Three hours of lecture per week. Prerequisites: 100A, Linguistics 5 or 100. Writing system, early dictionaries, historical phonology, and classical grammar.

176. Chinese Dialectology. (4) Three hours of lecture per week. Prerequisites: 161 and Linguistics 5 or 100. Analysis of the diversity of Chinese dialects. Some topics emphasized are: classification criteria, tonal development across dialects, dialectal interaction. Training in the discrimination and transcription of the sounds of several dialects.

181A. Chinese Literature in Translation. (4) Three hours of lecture per week. Lectures on principal authors, and individual works of Chinese literature from the beginnings to the 14th century. (F)

181B. Chinese Literature in Translation. (4) Three hours of lecture per week. Lectures on principal authors, and individual works of Chinese literature from the 14th century to the present. (SP)

183. The Classics of Chinese Philosophy. (4) Three hours of lecture per week. Formerly 191 Oriental Languages 116. A survey of the “Golden Age” of Chinese thought covering the Analects of Confucius, Chuang Tzu, Lao Tzu, Han Fei Tzu, and other important Taoist, Confucian, and Legalist works as well as lesser known tracts on early Chinese aesthetics, ethics, political philosophy, mysticism, logic, cosmology, and the philosophy of science. (SP) Riegel

186. Popular Culture in 20th-Century China. (4) Three hours of lecture per week. This course explores the meaning of “popular culture” in the context of China’s recent encounter with the West. Beginning with the turn of the century, we will focus on aspects of technology, mass media, the reinvention of folk songs and ballads, consumer culture, state policy, and the rise of a national cinema.

H195A. Honors Course. (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 senior honors thesis. Limited to senior honors candidates in East Asian Languages (for description of Honors Program, see Index).

196. 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: 150 or 151. Formerly Orientational Language 213. Analysis of classical texts and inscriptions.

198. Popular Culture in 20th-Century China. (4) Three hours of seminar per week. Prerequisites: Consent of instructor. Course concentrates on the late Nanbei-chao through Five Dynasties period. Topics vary from semester to semester and include poetry, biography, historiography and external relations.

234. Texts on the Civilization of Medieval China. (4) Three hours of seminar per week. Course content varies with interests of students.

220. Seminar in Philological Analysis of Ancient Chinese Texts. (4) Three hours of seminar per week. Prerequisites: 150 or 151. Formerly Orientational Language 213. Analysis of classical texts and inscriptions.

222. Early Chinese Thought. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Classical Chinese 220 or Classical Chinese 221A. The topic varies according to the interests of the participants. (SP)

226. Seminar in Chinese Literary History. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Classical Chinese 220 or Classical Chinese 221A. The topic varies according to the interests of the participants. (SP)

230. Seminar in Chinese Literary History. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Classical Chinese 220 or Classical Chinese 221A. The topic varies according to the interests of the participants. (SP)

232. Historical Documents. (4) Three hours of seminar per week. Course content varies with interests of students.

233. Seminar in Texts on Chinese Drama and Dramatic Criticism. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: 150 or consent of instructor. Readings in plays and/ or dramatic criticism from the Yuan and Ming eras and detailed examination of primary and secondary sources on the history, development, and evolution of drama, and collected texts from the Ming/Ch’ing period. Topic of the course changes with the year.

254. Studies in East-West Literary Relations. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Preparation in two foreign languages, one of which must be Chinese. Formerly C254. Comparative investigation of a literary topic requiring the study of both Chinese and Western documents.

255. Seminar in Early Chinese Fiction. (4) Three hours of seminar per week. Studies in the historical development of Chinese fiction and critical analysis of selected texts from the Ming/Ch’ing period.

266. Seminar in Chinese Linguistics. (4) Three hours of seminar per week. Prerequisites: 161 or 165. The topic varies according to the interests of the participants: dialectology, phonology, or grammar.

280. Modern Chinese Cultural Studies. (4) Course may be repeated for credit as topic varies. Three hours of seminar 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 theoretical problems and methodological approaches. Topics include print culture, cinema, popular music, and material culture; emphasis varies from year to year.

296. 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.

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.

601. Individual Study for Master’s Students. (1-8) Hours to be 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.

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.

Japanese

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 Japanese. (5,5) Five hours of lecture per week. Prerequisites: 1A is prerequisite to 1B.

1A5-1B5. Supplementary Work in Kanji. (1,1) One hour of lecture per week. Must be taken on a passed/not passed basis. Prerequisites: 1A5 is prerequisite to 1B5. A course designed to be taken concurrently with 1A or 1B to help students improve over-all kanji performance. The course will make the kanji learning process easier by providing exercises and background information about the relationships between characters and how they function. (F,SP) Staff

10A-10B. Intermediate Japanese. (5,5) Five hours of lecture per week. Prerequisites: 1B; 10A is prerequisite to 10B.

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week for fifteen weeks or two hours of seminar per week for eight weeks. Sections 1 and 3 to be graded on a passed/not passed basis. Sections 2 and 4 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 open to all freshmen and are often taught by both faculty and students.

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.

80. Japanese Culture. (4) Three hours of lecture per week. Prerequisites: Lower division standing. Introduction to Japanese culture from its origins to the present: premodern historical, literary, artistic, and religious developments, modern economic growth, and the nature of contemporary society, education, and business. Class conducted in English.

96. 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 seminar on selected topics not covered by regularly scheduled courses.

99. Independent Study for Lower Division Students. (1-4) Enrollment is restricted; see the Intro-
duction 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.

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 standing. Independent study in topics not covered by regularly scheduled courses.

Graduate Courses

230. Seminar in Classical Japanese Poetry. (4) Three hours of seminar per week. Prerequisites: 130. A graduate seminar intended to provide an opportunity for advanced study in the area of the title. Content may be changed from year to year.


234. Seminar in Classical Japanese Drama. (4) Three hours of seminar per week. Prerequisites: 120, 130, 134 or 140. Analysis and discussion of major plays from the no and joruri theaters. Selections from the works of Zeami and Chikamatsu will be made in alternate years.


255. Seminar in Prewar Japanese Literature. (4) Three hours of seminar per week. Prerequisites: Graduate standing and permission of instructor. Reading and critical evaluation of selected texts in prewar (1868-1940) Japanese fiction, drama, or poetry.

259. Seminar in Postwar Japanese Literature. (4) Three hours of seminar per week. Prerequisites: Graduate standing and permission of instructor. Reading and critical evaluation of selected texts in postwar (1940-present) Japanese fiction, drama, or poetry.

269. Seminar in Japanese Linguistics. (4) Three hours of seminar per week. Prerequisites: 162 or consent of instructor. The topic varies according to the interests of the participants: dialectology, phonology, or syntax and semantics.

286. 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.

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.

601. Individual Study for Master’s Students. (1-8) Hours to be 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.

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.

Buddhism

Instructor approval is recommended for enrollment in language courses.

Courses numbered 180-189 are lecture courses given in English.

Lower Division Courses

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. Two hours of seminar per
an opportunity for qualified students to prepare for var-
tation with the major field adviser, intended to provide
lecture per week.

Hours to be arranged. Must be taken on a
thesis supervisor and graduate adviser. Units may not used to meet ei-
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. Advanced conversation, writing skills, and practice in the use of standard reference tools will also be em-
phaisized, with the goal of preparing students to do in-
dependent research in Korean.

150. Modern Korean Poetry. (4) Three hours of lec-
ture per week. Prerequisites: 100B. In this course, we
will read poetry in Korean from various periods (Koryo dynasty, Yi dynasty) and modern poetry. Some works of contemporary Korean literary criticism will also be read and discussed.

155. Modern Korean Prose. (4) Three hours of lec-
ture per week. Prerequisites: 100B. In this course, we will read selections from fiction by O Chonghui, Yun Hunggil, Pak Wanso, Yi Munyol and Cho Sehui. Stu-
dents will translate and discuss texts in class, and submit written translations.

160. Korean Linguistics. (4) Three hours of lecture
per week. Prerequisites: 10B. This course is an intro-
ductory course in Korean linguistics. The course will cover the Korean lan-
guage from several perspectives: phonetics, phonol-
ology, morphology, syntax, semantics, orthography, and the history of the Korean language.

199. Independent Study. (1-4) Enrollment is re-
stricted; 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: Ju-
instructor. Independent study in topics not covered by regularly scheduled courses.

Graduate Courses

296. 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.

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 lec-
ture per week. Prerequisites: 1A is prerequisite to 1B.

10A-10B. Intermediate Korean. (5,5) Five hours of lec-
ture per week. Prerequisites: 1B, 10A is prerequisite to 10B.

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Prerequisites: Priorly given to freshmen and sopho-
more. Freshman and sophomore seminars offer lower division students the opportunity to explore an intel-
lectual 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 de-
partment to department and from semester to semester.

Upper Division Courses

100A-100B. Advanced Korean. (4,4) Three hours of lecture per week. Prerequisites: 10B; 100A is prereq-
tute to 100B.

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 em-
phaisized, with the goal of preparing students to do in-
dependent 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 spe-
cialized texts in modern Korean drawn from history, so-
ciogy, economics, etc. Advanced conversation, writing skills, and practice in the use of standard refer-
ence tools will also be emphasized, with the goal of preparing students to do in-
dependent research in Korean.

150. Modern Korean Poetry. (4) Three hours of lec-
ture per week. Prerequisites: 100B. In this course, we
will read poetry in Korean from various periods (Koryo dynasty, Yi dynasty) and modern poetry. Some works of contemporary Korean literary criticism will also be read and discussed.

155. Modern Korean Prose. (4) Three hours of lec-
ture per week. Prerequisites: 100B. In this course, we will read selections from fiction by O Chonghui, Yun Hunggil, Pak Wanso, Yi Munyol and Cho Sehui. Stu-
dents will translate and discuss texts in class, and submit written translations.

160. Korean Linguistics. (4) Three hours of lecture
per week. Prerequisites: 10B. This course is an intro-
ductory course in Korean linguistics. The course will cover the Korean lan-
guage from several perspectives: phonetics, phonol-
ology, morphology, syntax, semantics, orthography, and the history of the Korean language.

199. Independent Study. (1-4) Enrollment is re-
stricted; 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: Ju-
instructor. Independent study in topics not covered by regularly scheduled courses.

Graduate Courses

296. 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,S,P) Staff

Economics

(Graduate and Service Courses)

Graduate and Service Courses

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Admission to the Major

The major may be declared in the sophomore or junior year, and students are admitted in fall, spring, or summer sessions. A departmental application is required. Berkeley students are asked to file an application for admission, available in 543 Evans Hall during the first four weeks of spring, summer, and winter sessions. Graduates should speak with an economics advisor to determine when they may apply. Although many factors are considered in determining admission to the economics major, the main criterion is academic performance as measured by GPA in prerequisite courses (see prerequisites listed below). Unfortunately, because of limited enrollment and resources available, it has proved necessary to restrict the number of students accepted to the major. Prospective majors are encouraged to consult an economics advisor to determine whether or not they may be admitted to the major.

Upper Division Undergraduate Program

Prerequisites: The College of Letters and Science reading and composition requirement; the University’s American history requirement; one year of calculus (Mathematics 1A-1B or Mathematics 16A-16B) and one year of statistics (either Statistics 20, 21, 21X, 131F, 101, 102, 134, or 135) (the statistics course must have a calculus prerequisite); Economics 1 or 2; and Economics 100A or 100B or 101A or 101B or Mathematics 53 or 54. Students should refer to the online course catalog for possible changes in these requirements.

Major Requirements:

Economics 100A and 100B, or 101A and 101B, Econometrics (either Economics 140 or 141) and five upper division courses taken from the categories of theory, applications and institutions, and economics history and thought. All courses must be taken on a letter-graded basis (please see handbook).

Advising: All majors are encouraged to consult with faculty advisors and the undergraduate assistant for assistance 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 advisor no later than their first semester of the senior year. The department recommends a student for graduation with honors based on (a) evidence of superior performance provided by a thesis written in the senior year, and (b) the student’s course grade point average and major GPA requirement is 3.5 in upper division economics courses and 3.3 GPA overall. The senior thesis may be an extension of a seminar paper prepared by a student during the senior year. A faculty member must inform the Department of Economics of a faculty member interested in having a student join a research team while preparing for the Ph.D. degree. Also listed as Mathematics C103.

98. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curriculum section of this catalog. Hours to be arranged. Students will receive no credit for 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. Three hours of lecture and two hours of discussion per week. Prerequisites: 1 or 2 or 3, or Environmental Economics and Policy 1, and Mathematics 1A or Mathematics 16A. Resource allocation and price determination. (F,SP) Staff

100B. Economic Analysis—Macro. (4) Students will receive no credit for 100B after taking 101B. Three hours of lecture and two hours of discussion per week. Prerequisites: 1 or 2 or 3, or Environmental Economics and Policy 1, and Mathematics 1A or Mathematics 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. Three hours of lecture and two hours of discussion per week. Prerequisites: 1 or 2 or 3. This course explores some issues in advanced microeconomic theory, with special emphasis on game-theoretic models and the theory of choice under uncertainty. Special applications will vary from year to year, but will generally include topics from information economics and models of strategic interaction. Staff

101B. Economic Theory—Macro. (4) Students will not receive credit for 101B after taking 100B. Three hours of lecture and two hours of discussion per week. Prerequisites: 101A. A study of theories of the determination of national income, employment, and price levels, with attention to the effects of monetary and fiscal policy. (F,SP) Staff

103. Introduction to Mathematical Economics. (3) Three hours of lecture per week. Prerequisites: Mathematics 1A-1B, 53 and 54. Formerly 102. Selected topics illustrating the application of mathematics to economics. 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.

104. Advanced Microeconomic Theory. (4) Three hours of lecture and one hour 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. Special 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. Prerequisites: 100A-100B or 101A-101B. A survey of the theories of major economists from Adam Smith to Keynes. Staff

110. Game Theory in the Social Sciences. (4) Students will receive no credit for 110 after taking 104. Three hours of lecture and one hour of discussion per week. Formerly 110. A non-technical introduction to game theory. Basic principles, and models of interaction among players with strong social motivations. Applications to political science, economics, and other social sciences. Also listed as Political Science C135 and Political Economy of Industrial Soc C135.

113. American Economic History. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1 or 2. A survey of trends in the American economy; emphasis on factors explaining economic growth and the changing distribution of the gains and losses associated with economic growth. This course is equivalent to History 135; students will not receive credit for both courses. (F,SP) Staff

114. American Economic History Seminar. (4) Three hours of seminar per week. Prerequisites: 113.
115. The World Economy in the Twentieth Century. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1 or 2. Development of the world economic system with particular reference to world-wide trading relationships. This course is equivalent to History 160; students will not receive credit for both courses. Staff.

121. Industrial Organization and Public Policy. (4) Three hours of lecture, one hour of discussion, and consent of instructor. Prerequisites: 100A or 101A. The organization and structure of production in the U.S. economy. Determinants of market structure, business behavior, and economic performance. Implications for antitrust policy. Staff.

122. Industrial Organization Seminar. (4) Three hours of seminar 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. Problems of public policy in the field of industrial organization. Analysis of regulatory consequences with particular attention to economic performance. Staff.

124. Special Topics in Industrial Organization. (3) Three hours of lecture per week. Analysis of market structure, conduct and performance in selected industries. See course announcement for current topics. Staff.

125. Economics of the Environment. (4) Students will receive no credit for 125A after taking Environmental Economics & Policy 101. Three hours of lecture and one hour of discussion per week. Prerequisites: 100A or 101A. Analysis of public policy measures designed to preserve and improve human environments.

126. Industrial Organization: Theory and Evidence. (3) Three hours of lecture per week. Prerequisites: 101A or consent of instructor. Structure, conduct, and performance of industrial markets in the U.S.; 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 Sector Microeconomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 102 or 136 and 101A-101B or 101A-101B. The economic and policy analysis of government expenditures, taxes, and intergovernmental fiscal relations. (F,SP) Staff.

132. Seminar in Public Sector Economics. (4) Three hours of seminar per week. Prerequisites: 131 and consent of instructor. Enrollment will be limited. A seminar paper is required.

136. Financial Economics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 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 intermediaries, and their regulation, in the financial system. (F,SP) Staff.

137. Aggregate Economics Seminar. (4) Three hours of seminar per week. Prerequisites: 102 or 136 and 101A-101B. Enrollment will be limited. A seminar paper is required. Staff.

140. Econometric Theory and Statistics. (4) Students will not receive credit for 140 after taking 141. Three hours of lecture and one-half hour of discussion per week. Prerequisites: 101A-101B or 101A-101B and Statistics 20, 21, or 131A. In this course, we do not use formal mathematical arguments. Instead, students will learn principles by example and graphical description. (F,SP)

141. Economic Statistics and Econometrics. (4) Students will not receive credit for 141 after taking 140. Two hours of lecture and one and one-half hours of discussion per week. Prerequisites: 100A-100B or 101A-101B and Statistics 20, 21, or 131A. Introduction to problems of observation, estimation, and hypothesis testing in economics through the study of the theory and application of linear regression and correlation. Critical evaluation of selected examples of empirical economic research and exercises in applied econometrics. (F,SP) Staff.

151. Labor Economics. (3) Three hours of lecture per week. Prerequisites: 102 or 101A-101B or consent of instructor. This course will analyze the economic forces that shape labor markets, institutions, and performance in the U.S., and at least one European country (or country). Institutions examined include trade unions, legal regulations, and social conventions. (F,SP) Staff.

152. Wage Theory and Policy. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100A-100B or 101A-101B. This course focuses on theoretical and empirical analysis of wage and employment determination in the labor market. In addition, the role of public policy in affecting wage and employment outcomes in the U.S. labor market is examined. Topics include labor supply, labor demand, minimum wages, the economics of education and training, discrimination and the impact of antidiscrimination programs, changes in wage inequality over time, immigration, unions, unemployment, and poverty. (F,SP) Staff.

153. Labor Economics Seminar. (4) Three hours of seminar per week. Prerequisites: 151 or 152 and consent of instructor. Topics in labor economics. Seminar paper required. Staff.

157. Health Economics. (3) Three hours of lecture per week. Prerequisites: 141. 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 purchase of health insurance, and economic analysis of efficient regulatory policies toward the health care sector. Staff.

161. Economic Systems. (3) Three hours of lecture per week. Prerequisites: 1 or 2. Economic organizations and institutions, and their impact on economic variables. Models of economic systems; studies of actual economies. Staff.

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

173. Economic Development Seminar. (4) Three hours of seminar per week. Prerequisites: 171 or 172 and consent of instructor. A seminar paper will be required.

175. Economic Demography. (3) Three hours of lecture per week. Prerequisites: 1 or 2. Formerly 175. A general introduction to economic demography, addressing the following kinds of questions: What are the economic consequences of immigration to the U.S.? Will international nations be able to afford the health and pension costs of the aging populations? How has the baby boom affected its economic well-being? Why has the Third World caught up? In industrial countries, why is marriage postponed, divorce high, fertility so low, and extramarital fertility rising? What are the economic and environmental consequences of population growth? Also listed as Demography C175. 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.

182. International Monetary Economics. (4) Three hours of lecture and one hour 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 international capital flows, and the determination of exchange rates. Staff.

197. Field Studies. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a pass/no pass basis. Prerequisites: Upper-division standing. Written proposal must be approved by Department Chair. Supervised field studies in economics. Proposal may be initiated by the student. (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 pass/no pass basis. Prerequisites: Upper-division standing. Written proposal must be approved by Department Chair. Enrollment is restricted. (F,SP) Staff.

201A-201B. Economic Theory. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 100A-100B or 101A-101B or equivalent. Mathematics 53 and 54 or equivalent. Basic preparation for the Ph.D. program including: theory of the firm and the consumer, general equilibrium, capital theory, and welfare economics. Staff.

202A-202B. Macroeconomic Theory. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 100A-100B or 101A-101B or equivalent. Mathematics 53 and 54 or equivalent. Basic preparation for the Ph.D. program including: theory of the firm and the consumer, general equilibrium, capital theory, and welfare economics. Staff.

202C. Capital and Economic Growth. (3) Two hours of lecture per week. Prerequisites: 201A-201B and 202A-202B. An examination of the roles of time and capital in the processes of individual choice and the theories of production and distribution. The course will discuss the nature of capital and consider the role of capital accumulation in modern theories of economic growth and planning. Staff.

204. Mathematical Tools for Economics. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: To be taken concurrently with 201A or consent of instructor. A review and discussion of the basic math tools needed for graduate work in economics. (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 and to the choice of government policies for regulated industries. The second half of the course will treat the design of auctions, regulation with costly or imperfect monitoring, mechanism design with limited contracts. 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 involve as wide a range of mathematical techniques and of economic theories including theories of preference, utility, demand, personal probability, games and general equilibrium. Also listed as IDS 213A-213B and Math 213A-213B.

208. Seminar in Mathematical Economics and Advanced Economic Theory. (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 strategy solutions to various problems such 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

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.

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.

211. Seminar in Economic History. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Staff

215C. Selected Topics in Political Economy. (3) Two hours of lecture per week. Special topics, varying from year to year.

220A. Industrial Organization. (3) Two hours of lecture per week. Prerequisites: 210A. Market structure, conduct and performance in the unregulated sector of the American economy, including the economic analysis of industrial policies related to the promotion or restriction of competition. Staff

220B. Industrial Organization. (3) Two hours of lecture per week. Prerequisites: 220A. Continuation of 220A. The characteristics of regulated industries and the consequences of regulation for economic performance. Staff

220C. Special Topics in Industrial Organization. (3) Two hours of lecture per week. Prerequisites: See course announcement. See course announcement for current topics.

221. Seminar in Industrial Organization: Regulation and Public Enterprise. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Staff

224. Economics of Institutions. (3) Two hours of lecture per week. This course develops the proposition that institutions have pervasive ramifications for understanding economic organization. A comparative institutional 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 advantages. Staff

230A. Public Sector Microeconomics. (3) Two hours of lecture per week. The economic and policy analysis of government expenditures, taxes, and intergovernmental fiscal relations. 230A is not a prerequisite for 230B. Staff

230B. Public Sector Microeconomics. (3) Two hours of lecture per week. Government intervention changes opportunities and incentives for firms, families, individuals, service providers, and local government. This course considers the incentive effects of government expenditure programs. The primary emphasis 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 econometric techniques (e.g., discrete choice, duration analysis) will be discussed in the context of the empirical literature. (F,SP) Staff

230C. Public Sector Microeconomics. (3) Two hours of lecture per week. The economic and policy analysis of government expenditures, taxes, and intergovernmental fiscal relations. Also listed as Public Policy C214. (F,SP) Quigley

237. Seminar in Advanced Macroeconomics and Money. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Staff

240A. Introductory Statistics and Econometrics. (4) Three hours of lecture and one and one-half hours of laboratory per week. Prerequisites: 204 or equivalent. Formerly 240. This is the first course in a two semester sequence introducing graduate students to basic techniques in econometrics. Basic statistics and the classical linear regression model are covered. Emphasis is given to computing estimators using simulated and actual data sets. There is a focus on analyzing data from non-controlled experiments. Staff

240B. Introduction to Statistics and Econometrics. (4) Three hours of lecture and one and one-half hours of laboratory per week. Prerequisites: 240A or equivalent. Econometric models and applications, including nonlinear regression, simultaneous equations, limited dependent variable models, time-series analysis, and non-parametric methods. (F) Staff

241A. Econometrics. (4) Three hours of lecture per week. Prerequisites: Statistics 200A-200B or equivalent and a course in linear algebra. Recommended: Math 112. Intended for students specializing in econometrics and others with strong mathematical backgrounds. 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. Simulation of equations and time-series models. Staff

242. Seminar in Econometrics. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Staff

243. Special Topics in Econometric Theory. (2) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: 241A-241B. See departmental course description each semester.

244. Applied Econometrics. (3) Three hours of lecture per week. Prerequisites: 240. Methods of applied econometrics, with emphasis on alternative modelling strategies and problems met in practice. Intended for doctoral students conducting empirical research.

250A-250B. Labor Economics. (3;3) Two hours of lecture per week. Prerequisites: 250A is prerequisite to 250B. Consent of instructor. Staff

250C. Labor Economics. (3) Two hours of lecture per week. Prerequisites: 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. Staff

270A-270B. Analytics of Economic Development and Planning. (3;3) Two hours of lecture per week. Problems of underdevelopment and poverty, policy issues and development strategies. Staff

270D. Special Topics in Development. (3) Two hours of lecture per week. Prerequisites: See course announcement. See course announcement for current topics and prerequisites.

271. Seminar in Economic Development and Planning. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Staff

C275A. Economic Demography. (3) Two hours of lecture per week. Economic analysis of demographic change in developing and developed countries including capital formation, labor markets, transfers and urbanization. Economic determinants of fertility, mortality and migration. Also listed as Demography C275A. (F,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 prerequisite 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, developing 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 experimental treatment of open-economy macroeconomics and finance. Topics include trade elasticities, the determination of the trade balance and income under fixed and floating exchange rates, purchasing power parity, devaluation in small open economies, quantifying the degree of international capital mobility, 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

C287. Special Topics in Health Economics. (2) Hours of seminar per week. Prerequisites: 287. This seminar features current research of faculty, from UC Berkeley and elsewhere, and advanced doctoral students who are investigating recent theories and empirical work in health economics. Participating departments include economics and the graduate group in Health Services and Policy Analysis. A survey of the literature will be conducted and students will be required to write an original paper for the course. Also listed as Public Health C287. (F) Staff

291. Departmental Seminar. (1) One and one-half hours of seminar every other week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 201B, 202B. A general interest seminar featuring speakers and topics of broad interest whose work will be important for all areas of economics. (F,SP)

295. Survey of Research in Economics. (1) Two hours of seminar per week. Must be taken on a
### Education

**Graduate School of Education**

- **Office:** 1501 Tolman Hall, gse_info@ucb.berkeley.edu, (510) 642-3729
- **http://www-gse.berkeley.edu**

#### Dean

Paul D. Pearson, Ph.D.

#### Professors

- Paul A. Heist, Ph.D., D.H. (hon.)
- James L. Jarrett, Ph.D.
- James R. Gray, M.A.
- Roberto P. Noguera, Ph.D. University of California, Berkeley.
- Kathleen E. Metz, Ed.D. University of Massachusetts.
- Roger P. Hall, Ph.D. University of California at Irvine.
- Kathleen S. Hartshough, Ph.D. University of California, Berkeley.
- Allan B. Wilson, Ph.D.
- Ann E. Cunningham, Ph.D. University of Michigan.
- Curtis D. Hardyck, Ph.D.
- Anne Alcott, M.A. University of California, Berkeley.
- Harley Shaiken, B.A. Wayne State University.
- Mary Gearhart, Ph.D. CUNY Graduate School of Education.
- Susan D. Holloway, Ph.D. Stanford University.
- Thomas W.产妇, Ph.D. University of California, Berkeley.
- Christine M. Cziko, M.A. Lehman College, CUNY.
- Prentice Starkey, Ph.D. University of Texas at Austin.
- Carol K. Dill, Ph.D. Stanford University.
- Emma E. Garcia, Ph.D. University of Kansas.
- John C. Whatley, Ph.D. University of Maryland.
learning, and teaching in complex social contexts, including homes, schools, and workplaces. Those involved in the field of education are now immersed in a complex set of challenges—locally, regionally, nationally, and internationally. At no other time in history have we faced the substantive challenge of merging issues of equity and excellence in such a dramatic way. Not only are many of you familiar with these challenges, but you value and welcome them. Our commitment to ensure that all students have a successful educational experience will help other educators and community members embrace these challenges.

The school offers programs that lead to advanced degrees in education: the M.A., the Ph.D., and the Ed.D. In addition, the school grants credentials to professionals who plan to work in the schools as teachers, principals, and school psychologists.

The Graduate School of Education includes three academic groups: 1) Cognition and Development; 2) Education in Language, Literacy, and Culture; and 3) Policy, Organization, Measurement, and Evaluation. There is also a program in Social and Cultural Studies in Education. Each specialization represents an approach to the study of education or a substantive field of educational study.

The Cognition and Development (CD) area of study unites faculty whose research and teaching interests focus on the interplay between social and developmental processes in diverse areas of human knowledge and experience. The faculty focus on social and cultural development, as well as art, mathematics, science, and technology. Faculty research typically occurs in field settings (classrooms, museums, informal social groups), providing fertile sites for conceptual advances as well as the improvement of educational practices. Cognition and Development supports both professional and academic growth, promoting the other in courses and research opportunities.

Education in Language, Literacy, and Culture (ELLIC) is particularly committed to preparing students to work with those who have been poorly served by existing educational institutions. Research in these areas takes an interdisciplinary perspective and is informed by the work in language, literacy, instructional and sociocultural theory, as well as applied linguistics. The ELLIC faculty is committed to preparing researchers and educators who will serve as leaders in higher education and agents of change in public education in the areas of literature, English education, reading education, second language teaching and learning, and teacher education.

Programs in Policy, Organization, Measurement, and Evaluation (POME) emphasize the study of schools as institutions, the history and process of educational change and reform, the formulation and effects of educational policy, and the methodology of research, measurement, and evaluation in education. POME faculty have strengths and interests that combine:

- a focus on the institutions of schooling, analyzed from various perspectives including sociology, economics, history, and philosophy;
- experience in linking research, policy, and practice at the national, state, and local levels;
- a breadth and depth of methodological, measurement, and evaluation expertise adequate both to mount ambitious programs of policy-oriented research and to inform sound institutional leadership and decision making.

The Ph.D. program in Social and Cultural Studies in Education (SCS) is in social and cultural analysis and social theory. The program is interdisciplinary, involving anthropology, sociology, history, and philosophy, and separate disciplinary programs, but in their complex interaction. The faculty have special interests in research that expands our understanding of what constitutes educational sites and practices, especially in the workplace. The faculty also is deeply involved in exploring the role of educational practices of all kinds in the production and reproduction of poverty and inequalities of race, gender, and social class. Social and Cultural Studies perspectives recognize that public schools in the U.S. are but one among an infinite range of sites of learning. Of equal importance is an investigation of the broader cultural and societal contexts that frame and constitute educational practices.

Undergraduate Minor

The School of Education offers a minor in education for undergraduates currently enrolled at Berkeley. The minor in 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 enable students to develop a critical understanding of educational policy, practice, and theory. Students will examine the evolution of the amateur athlete in the 19th century and subsequent commercialization of college sports within the 20th century. Students will graduate with experience in linking research, policy, and practice.

For more information regarding this program, please contact 1600 Tolman Hall to pick up a handout describing the minor and its requirements, and to speak to the undergraduate minor advisor.

Lower Division Courses

24. Berkeley Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminars per week. Prerequisites: Priority given to freshmen. The Berkeley 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. Enrollment limited to 15 freshmen. Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Three hours of seminars per week. 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. Staff

40AC. Experiencing Education: Race and Ethnicity Inside Schools. (4) Three hours of lecture and one hour of discussion per week. 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 the dominant and minority groups. This course satisfies the American cultures requirement. Satisf.

50. Learning to Comprehend Written Texts. (4) Four hours of lecture/discussion per week. This course provides students with an understanding of the processes involved in reading and writing written texts and an ability that plays a central role in school success at all levels. The topics include models of skilled reading, metacognition, comprehension of main idea, annotating, summarizing, graphic organizers, speed reading, vocabulary learning, text structure, and text difficulty, negotiating academic discourse, the role of interest and motivation in reading, and reading problems and dyslexia. The major focus of the course will be on college-level reading. Students will have the opportunity to apply some of the processes to their own reading. Simons, Staff

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. The three 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 as they relate to sport in higher education. Simons, Van Rhee-

90A. Learning from Text in Anthropology. (1-2) One to two hours of lecture/discussion per week per unit. 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 Anthropology. (F,SP) Staff

90B. Learning from Text in Asian American Studies. (1-2) One to two hours of lecture/discussion per week per unit. 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 Asian American Studies. (F,SP) Staff

90C. Learning from Text in Chicano Studies. (1-2) One to two hours of lecture/discussion per week per unit. 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 Chicano Studies. (F,SP) Staff

90D. Learning from Text in African American Studies. (1-2) One to two hours of lecture/discussion per week per unit. 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 African American Studies. (F,SP) Staff

90E. Learning from Text in Ethnic Studies. (1-2) One to two hours of lecture/discussion per week per unit. 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

90F. Learning from Text in History. (1-2) One to two hours of lecture/discussion per week per unit. 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 History. (F,SP) Staff

98. Directed Group Study. (1-4) One to two hours of lecture/discussion per week per unit. Must be taken on a passed/not passed basis. Formerly 98. This course assists undergraduates with reading and study skills. Students learn successful approaches to learning from their texts in History. (F,SP) Staff

99. Supervised Independent Study. (1-4) Course may be repeated for credit as topic varies. Enrollment
The situations and experiences of women in higher education in the United States, employing both historical perspectives and data covering the contemporary scene, shows that the history of American education is not presumed.

130. Education and American Society. (4) Course may be repeated once for credit if topic varies. Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Formerly C130 and Interdisciplinary Studies 130. Examination of educational institutions in America. Emphasis upon the shifting educational responsibilities of families, church, workplace, schools, colleges, and youth culture; the demographic, economic, political, and cultural forces explaining the rise of public schooling; present-day challenges to school hegemony. Staff

140. Literacy: Individual and Societal Development. (3) Three hours of lecture/discussion per week. A consideration of literacy development in individuals and in societies: definitions of literacy, its effects on cognitive functioning in individuals, and its relation to cultural, economic, and political development in societies. These relationships and effects will be analyzed historically, psychologically, and socially. Hull, Baquedano-López

140AC. Literacy: Individual and Societal Development. (4) Three hours of lecture/discussion per week. Students will conduct independent study or research on topics relevant to curriculum trends and teaching practices. Students complete a project for each module that links research and observations in elementary schools through concurrent enrollment in one unit of 197. (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. (F,SP) Starkey

114B. Seminar in Early Development and Education. (3) Course may be repeated once for credit. Three hours of seminar per week. Prerequisites: 114A or consent of instructor. Theory, practices, and social policy issues in early education and child care. Discussion and practical experience in structured discussions, 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, we analyze research on children’s mathematical thinking and explore how this research can be applied in classrooms. Students complete a project for each module that links research and observations in elementary schools through concurrent enrollment in one unit of 197. (SP) Gearhart

114C. Practicum in Early Development and Education. (4) Two hours of seminar and six hours of fieldwork per week. Theory, research, and field experience in early development and education. Students conduct educational activities with children in classrooms in preschool, elementary school, or after-school programs. Activities include assisting teachers in the development and use of instructional materials, teaching in a computer laboratory, and supporting parental involvement in schooling. Starkey

121A. Teaching Science in the Non-School Setting. (3) Three hours of lecture per week. A series of workshops conducted in demonstration classrooms at the Lawrence Hall of Science focusing on special techniques for teaching in a non-school setting. The course is designed to develop skills for persons working in museums and youth organizations as well as to introduce teaching to persons considering it as a professional career. Topics include teaching topics in Science, Mathematics, and Computing provide the central but not exclusive context for instruction. Staff

C122. Women in the University: Gender and Higher Education. (3) Three hours of lecture/discussion per week. The experiences of women in higher education in the United States, employing both historical perspectives and data covering the contemporary scene, shows that the history of American education is not presumed. Staff

130. Education and American Society. (4) Course may be repeated once for credit if topic varies. Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Formerly C130 and Interdisciplinary Studies 130. Examination of educational institutions in America. Emphasis upon the shifting educational responsibilities of families, church, workplace, schools, colleges, and youth culture; the demographic, economic, political, and cultural forces explaining the rise of public schooling; present-day challenges to school hegemony. Staff

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114B. Seminar in Early Development and Education. (3) Course may be repeated once for credit. Three hours of seminar per week. Prerequisites: 114A or consent of instructor. Theory, practices, and social policy issues in early education and child care. Discussion and practical experience in structured discussions, 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, we analyze research on children’s mathematical thinking and explore how this research can be applied in classrooms. Students complete a project for each module that links research and observations in elementary schools through concurrent enrollment in one unit of 197. (SP) Gearhart

114C. Practicum in Early Development and Education. (4) Two hours of seminar and six hours of fieldwork per week. Theory, research, and field experience in early development and education. Students conduct educational activities with children in classrooms in preschool, elementary school, or after-school programs. Activities include assisting teachers in the development and use of instructional materials, teaching in a computer laboratory, and supporting parental involvement in schooling. Starkey

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C122. Women in the University: Gender and Higher Education. (3) Three hours of lecture/discussion per week. The experiences of women in higher education in the United States, employing both historical perspectives and data covering the contemporary scene, shows that the history of American education is not presumed. Staff
187. Cooperatives and Community Development: Education for Ownership. (3) Three hours of lecture per week. A survey of cooperative development strategies to strengthen economic and social opportunities 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

188. Experiencing Education: Gay and Lesbian Issues and American Schools. (3) Three hours of lecture per week. This class focuses on the experience of lesbians and gay men in secondary schools. We will pose critical questions about the relationship between education and sexuality and explore issues such as curriculum, school safety, and HIV prevention. Staff

189. Democracy and Education. (4) Four hours of lecture per week. Prerequisites: Junior standing or consent of instructor. Education as a vehicle 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) Three hours of lecture and one and one-half hours of 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. Areas addressed are not limited to, but will include: democracy and education, testing and assessment, politics and education, and education and social inequality. 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 choice. We will develop and emphasize multiple perspectives. Hurst

191A. Workplace Experience in the Analysis of Work. (4) Four hours of lecture per week. This course is intended for undergraduates who are working while enrolled at Berkeley. It will provide an opportunity to analyze issues in the workplace such as employees' opportunities for learning, involvement in problem-solving, compensation and incentives, and how changing technology affects demand for skills. Students will also have the opportunity to pursue their own academic studies in the workplace. Stern

C193A. Environmental Education. (3) Five and one-half hours of lecture 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 Environ Sci, Policy, and Management C193A. (F, 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 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 Environ Sci, Policy, and Managers for 193B. (SP, 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 vary from semester to semester and section to section. Topics vary by semester and section. Staff

195C. Special Topics in the Foundations of Teaching. (1-4) Mathematics and science. Staff

196. Teaching One-on-One: Principles of Tutoring. Course may be repeated for credit. Two hours of lecture and one hour of discussion per week. A course for prospective tutors desiring to prepare for placement in local elementary and secondary schools. It introduces tutors to basic skills in tutoring within two overlapping categories: instructional and interpersonal. The instructional dimension introduces practical strategies for helping elementary and secondary school students overcome difficulties in learning. The interpersonal dimension introduces the development of communication and building trust in the tutoring relationship. (F,SP) Simons

197. Field Studies. (1-4) Course may be repeated for credit. One hour per semester. Prerequisites: Consent of instructor. A seminar in supervised field programs involving experiences in schools and school-related activities. (F,SP) Staff

198. Directed Group Study. (1-3) 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/withdrawal basis. Prerequisites: Consent of instructor. Upper-division standing. Group discussion, research, and reporting on selected topics. Student initiation in choice of subjects is solicited and welcomed. (F,SP) Staff

199. Supervised Independent Study and Research for Undergraduates. (1-4) Course may be repeated for credit. Independent study. Must be taken on a pass/withdrawal basis. Prerequisites: Consent of instructor. 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. Vygotsky’s theory. Primary emphasis on 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. Cognitive underpinnings of academic skills. Relations between cognitive development and children’s home and school environments.

200B. Social Development. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. An examination of research and social development from childhood to early adulthood. Review of different theoretical orientations to social cognition, moral, psychosexual development, and the role of social-environmental factors. Turiel

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 language 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, in the areas denoted by the titles of the following sections:

(1) Cognitive Development
(2) Learning and Memory Development
(3) Language, Staff

201C. Seminar on Reading Disability. (3-5) Three hours of seminar per week. Examination and analysis of basic issues in reading disability. Prerequisites: Consent of instructor. Examination, psychological and social factors, verbal factors, visual and perceptual factors, perceptual tests and remediation. Optional field work involves diagnosing and treating children with reading problems and preparing written case studies. Cunningham

201D. Seminar on Reading Disability. (3-5) For an additional 8 hours of fieldwork per week, an additional 2 units of credit will be awarded. Three hours of seminar per week. Examination and analysis of basic issues in reading disability. Topics include criteria for identification, psychological and social factors, neurological and genetic factors, verbal factors, visual and perceptual factors, perceptual tests and remediation. Optional fieldwork involves diagnosing and treating children with reading problems and preparing written case studies. Cunningham

202D. Seminars in Social and Personality Development. (2) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: Consent of instructor. Three 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
(3) Personality Development. Turiel

204C. Research Seminars: Inquiry in Educational Psychology. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. The doctoral program in Educational Psychology requires that students complete three projects of documentary and empirical research. As they engage in these projects, students will enroll (ordinarily during alternate years) in appropriate sections of the seminar. At each meeting, participants will present their own projects, and analyze those presented by others. Lambert

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, emergent literacy, reading, writing, mathematics, science, computer literacy, motivation, self-regulated learning, and classroom organization. Cameron

207A. Standard Tests in Education. (2) Two hours of lecture per week plus two hours of fieldwork biweekly. Introduction to measurement concepts and procedures applicable to the development, selection and utilization of educational and psychological tests in school settings. In particular it examines achievement, cognitive abilities, adaptive behavior and other tests commonly confronted by teachers and pupil personnel workers. Staff

207B. Individual Appraisal of Intelligence. (4) Three hours of lecture and six hours of fieldwork per week. Prerequisites: Consent of instructor. The theories and principles of intelligence as applied to the assessment of intelligence, measurement concepts applied to intelligence tests, development, administration and interpretation of the WISC-R, Stanford-Binet, and other assessment intelligence tests. Current controversial issues in testing, including issues pertaining to test bias and legal aspects of testing. Staff

207C. Diagnosis of Human Handicaps. (4) Three hours of lecture and six hours of fieldwork per week. Prerequisites: Consent of instructor. Reviews current criteria for eligibility for programs for the handicapped and evaluates available procedures for making diagnostic decisions. Special topics may include diagnosis of learning disabilities, mental retardation, neurological handi caps, emotional and behavioral disorders. Staff

207D. Assessment and Education of Exceptional Pupils in Regular Classes. (2) One hour of lecture and one hour of discussion per week. Methods for assessment of handicapped children and implications for their education in regular classes. Such topics as nondiscriminating testing, least restrictive environments, alternative programs, parent communication, interpersonal relationships, characteristics, behavior of exceptional pupils are covered in studies of individual exceptional children in regular classes. Staff
Admission to Developmental Teacher Education Pro-
gram

Theories and procedures for individual and group as-
sumption; children's learning and behavior problems
as applied to the design of individual and group pro-
ductions in the classroom.

Special Problems in Mathematics, Science
and Technology Education. (3) Requires: class par-
ticipation; three short papers, reaction note-
book. Holloway

The goal in this course is to provide students
in cognitive science in artificial intelligence
(Al) relevant to modeling human cognition.
The course is specifically aimed at students with
no prior programming experience. In the labs, students
will make use of a beginning system to teach
essential LISP programming and later provide in-
struction in basic AI programming techniques.

221B. Curriculum Development and Instruction in
Science. (3) Requires: class participation; three short
papers. Holloway

216. Child Care Research and Policy. (3) Requires:
lecture and course project. Three hours of lecture per
week. The course offers an overview of current
state of child care in terms of cost, supply and quality.
We will survey and analyze some of the mental
processes and trends, cultural influences, national and
international events, and legislative decisions.
Examination of the more successful programs will be made from various
learning theories, perspectives and research studies.

213B. Theoretical and Scientific Bases for School
Psychology Practice. (3) Requires: class participation;
three short papers. Holloway

220. Artificial Intelligence for Cognitive Scientists.
(3) Requires: class participation; three short papers, re-
action notebook. (SP) Holloway

222A. Programming and Problem Solving. (3) Requires:
lecture and course project. Three hours of lecture per
week. This course will analyze how experts and novices solve programming
problems, examine recent investigations of program-
ning and relate these investigations to recent research on learning and problem solving.
Experts' insights, current programming instruction will be examined. Other
topics include: programming environments such as MacPascal instruction, programming tools, and
student behavior when solving programming problems.

Linn

222B. Special Problems in Mathematics, Science
and Technology Education. (2-6) Requires: class par-
ticipation; three short papers, reaction note-
book. Holloway

221A. Introduction to Intelligent Computer As-
sisted Instruction. (2) Requires: class participation;
three short papers, reaction notebook. Holloway

225A. Introduction to Intelligent Computer As-
sisted Instruction. (2) Requires: class participation;
three short papers, reaction notebook. Holloway

228A. Qualitative Methodology. (3) Requires:
lecture and course project. Three hours of lecture per
week. The course explores contemporary research on theoretical cog-
nition, with a particular emphasis on "higher order thinking skills" and mathematical problem solving.
We discuss various frameworks for characterizing math-
ematical behavior and various methodologies for ex-
amining it. As an "honors level" course in the EMST curricular sequence, this course includes a major
course project. In their project, students engage in re-
sheet investigation of the main ideas studied in the course. Shoenerfeld

224C. Gender, Mathematics and Science. (3) Requires:
lecture and course project. Three hours of lecture per
week. The course explores com-
monly asked questions concerning gender, mathe-
matics, and science. We will discuss whether these are
appropriate questions and examine evidence related to the
questions. In this course we will also consider whether policies and practices concerning gender, mathe-
matics, and science should be changed and, if so, identity some of the steps that could be taken to improve the
current situation. Linn

225A. Qualitative Methodology. (3) Requires:
lecture and course project. Three hours of lecture per
week. The course offers an overview of current
cognitive science perspective, beginning with an examination of thinking involved in diverse
problem types. Students will then analyze the literature concerning cognitive issues in each problem
type, including representation, understanding," ac-
cess and availability of knowledge, access to one's
own cognitive processing, categorization, the archi-
tecture of knowledge, and the control of cognition. Also
listed as Psychology C220D.

C229. Proseminar: Problem Solving and Under-
standing. (3) Requires: class participation; three short
papers. Holloway

229B. Cognitive Science Approaches to Learning.
(2) Requires: class participation; three short
papers. Holloway

229F. Conceptual Change. (3) Requires:
lecture and course project. Three hours of lecture per
week. The course focuses on conceptual change in a single
domain. It offers this option, for the learning of
facts and skill acquisition. The course emphasizes re-
cognizing cognitive science-oriented approaches to defin-
ing "broad and deep" learning; understanding its prop-
erties; it draws on diverse cognitive approaches including
developmental psychology; analogies to the history of
user interface to computer systems, activity structures
involving multiple operation tools and programming) as
well as cognitive constructs being developed to un-
derstand performance. Requirements include three an-
alytical papers. d'Sessa

225D. Computer System Design Project Labora-
tory. (1) Requires: class participation; three short
papers. Holloway

228B. Cognitive Science Approaches to Learning.
(2) Requires: class participation; three short
papers. Holloway
240A. Language Study for Educators. (3) Three hours of lecture/discussion per week. This course will introduce educators 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, the development of language in the preschool and school years. This course will be required for all Ed.D. students and recommended as an introductory course to all students who have had no formal course work in linguistics. (F,SP) Fillmore, Baquedano-Lopez

240B. Theoretical Issues in the Study of Literacy. (3) Three hours of seminar per week. Formerly 242. Students will review trends in literacy theory, and then examine current theories of written language acquisition and early literacy. Connections will be made between research, theory, and practice. Hull, Mahiri

240C. Issues in First and Second Language Acquisition. (3) Three hours of seminar per week. Prerequisites: Course in linguistics or language acquisition. Formerly 244C. 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 learn from home to use language? 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 role of oral and cognitive implications of these issues. Fillmore

240D. Foundations of Curriculum Theory in the United States: A Survey. (3) Three hours of lecture 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 reconstructorist approaches. It concludes with a study of curriculum theory since the Reconceptualists. (F) Eidman-Aadahl

241A. Issues in Language Arts Instruction. (3) Three hours of seminar per week. Formerly 244B. Working within a developmental and sociolinguistic framework, this course will examine issues related to assessment and fostering of oral and written language development in the elementary and middle school years. Among the topics to be covered are the role of talk in learning, the role of the oral language arts, emergent literacy, and writing development. Dyson, McCullum

242A. Issues in Reading Instruction. (3) Three hours of lecture/discussion per week. Formerly 241. Course content will focus on the implications of reading theory and curriculum decisions on teaching reading at elementary and secondary school levels. Critical analysis of instructional programs will be followed by curriculum planning for the school site and district level. McCullum

243A. Issues in Secondary and Post-Secondary Reading Instruction. (3) Three hours of lecture per week. Formerly 244D. The focus of this course will be on the theoretical and instructional issues surrounding instruction in reading for secondary and post-secondary readers. Topics to include comprehension of literary text, comprehension of expository text, self-directed learning in reading understanding, the recognition and comprehension process, and approaches to curriculum organization. Staff

244A. Issues in Secondary English Instruction. (3) Three hours of lecture per week. Formerly 244E. This course examines theoretical and instructional approaches in secondary English education. Focus is on the multicultural classroom. Issues include relationships between oral and written languages, especially for non-native and non-standard dialect speakers; relationships between languages and learning; response to literature and to writing development for adolescents; and evaluation of English language skills. Mahiri

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 teaching of secondary English. It focuses on theories for grounded classroom decisions and connects theory to practice. The course takes an inclusive, effective approach to teaching English and introduces issues in constructing a secondary English curriculum. Students gain a foundation for developing plans for lessons and units of instruction. How to make English use in secondary academic communities of diverse learners, including non-native 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 curriculum in general, 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 portfolios for tracking student learning and 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 student populations. (SP) Freedman, Cziko

245A. Approaches in Teaching English as a Second Language. (3) Three hours of lecture per week plus field work assignment. Prerequisites: Applied linguistics course or a course in second language acquisition. Formerly 245A. 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. Topics include teaching English through content instruction, "structured English immersion," syllabus and curriculum design, second language reading, and language testing for placement and evaluation. (F,SP) Fillmore

245B. Literacy Practices in Out-of-School Settings. (3) Three hours of seminar per week. Formerly 245B. The goal of this course is to critically examine the history and current practices of remedial programs and to work toward a social/cognitive conception of problematic reading and writing that could reorient educational theory, policy, and practice. Hull

246B. Literacy Problems and Language Differences. (3) Three hours of lecture/discussion per week. Formerly 245. An examination of the role of language differences on the problems of learning to read and write. Emphasis will be on the effects of cultural and dialect differences on participation in classroom learning. These issues will be examined within a sociolinguistic and ethnographic framework. Staff

247A. Reconceiving Remediation: Literacy Theory to Practice. (3) Three hours of seminar per week. Formerly 248. The goal of this course is to critically examine the history and current practices of remedial programs and to work toward a social/cognitive conception of problematic reading and writing that could reorient educational theory, policy, and practice. Hull

247B. Literacy Practices in Out-of-School Settings. (3) Three hours of seminar per week. Formerly 244A. Emphasis is placed on design, articulation, and implementation of reading-language curricula for primary grades through community college. Dynamics of personal leadership basic to successful curricula implementation is stressed. Staff

249C. Foundations in Reading (Learning from Text) for Secondary Schools. (3) Three hours of lecture and one hour of fieldwork 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 content area courses. Learning from text theory to practice. (F,SP) McCullum

250A. Qualitative Research in Language/Literacy Education. (3) Three hours of lecture per week. Prerequisites: 241A (formerly 244A); or 240A (formerly 244D); or consent of instructor. Formerly 256B. Focuses on students’ and teachers’ use of language from a variety of interrelated perspectives, particularly development, sociolinguistic, and sociocultural contexts beyond schooling in homes, churches, community groups, neighborhood-based organizations, clubs, gangs, special interest groups, and in the ongoing settings of the community. This course is intended to help students understand and write about how to use theoretical perspectives to understand and write about how students use language in their everyday lives. Staff

250B. Psycholinguistics and Language Learning. (3) Three hours of seminar per week. Formerly 253A. Psycholinguistic theory and 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 instructional settings? What skills can they transfer from their native languages, and literacy in L1 transfer to the way the L2 is used in L2 speech and writing? Consideration of various hypotheses and theories that consider language learning from a linguistic, cognitive and discourse perspective. Topics include: interlanguage hypothesis, transfer and acquisition, cognitive vs. sociocultural theories, language acquisition, interlanguage theories, affective and cultural variables, schema theory, speech act and discourse theory, and cross-cultural pragmatics. Kramsch

250C. Discourse Analysis. (3) Three hours of seminar per week. Examination of the major linguistic, psycho- and sociolinguistic concepts and theories of dis-
course and their application to the analysis of spoken and written texts in education. Topics include: coherence and cohesion, deixis, speech acts, genres, systems of conversational and ritual constraints, scripts and frames, information structure, narrative structure. Kramsch

250D. Language and Identity. (3) Three hours of lecture/discussion per week. Relationship between language, the self, the ideology of race, and the construction of individual and collective identity, and its significance in educational contexts. Topics covered include language as embodied practice, language and subjectivity, pedagogy and language learning, language-mediated action and as the social symbolic construction of identity, writing and textual identity, authority and voice, language learning memoirs as acts of identity, the politics of recognition, linguistic human rights. (SP) Kramsch

251A. Research on Early Literacy Development. (3) Three hours of seminar per week. Prerequisites: 240B (formerly 242) or 241A (formerly 244B); or consent of instructor. Formerly 256A. This course is designed for advanced graduate students interested in the social and cognitive roots and the developmental history of literacy in which particular attention is given to early writing. Emphasis will be given both to children's early experiences in the home and to their initial school experiences. Dyson

252A. Reading Research: Sociocognitive Perspective. (3) Course may be repeated for credit. Three hours of seminar per week. Formerly 251. An examination of selected topics on reading research in the sociocognitive perspective of reading research of recognition, reading comprehension, the relationship between decoding and comprehension, attitudes toward reading, and models of the reading process. Cunningham

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 methods of research to develop research design and reporting of research findings on the written language. Freedman

254A. Research in Second Language Acquisition. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Linguistics, language acquisition, or ESL background; or consent of instructor. Theory and research on untutored acquisition of second languages by children and adolescents. Focus on cognitive and social variables of the learning process and on the processes of individual differences. Examination of educational problems encountered by second language learners. Fillmore

255A. Issues in the Study of Bilingualism. (3) Three hours of lecture/discussion per week. Formerly 253. An analysis of sociolinguistic frameworks to which new research students will examine key issues in the study of bilingualism. Attention will be given to such areas as: definitions and typologies of bilingualism, the acquisition of bilingual ability, the description and measurement of bilingualism, and the nature of societal bilingualism. Much time and attention will be devoted to questions and controversies surrounding bilingualism and education. Fillmore, Staff

256A. Research on Technology and Literacy. (2) Course may be repeated for credit with consent of instructor. Two hours of lecture and three hours of laboratory per week. Formerly 247. This course focuses on the uses of computer and allied information technology in literacy instruction. Students will learn computer and critique instructional software, testing these programs on the uses of computer and allied information technologies in literacy instruction. Students will use and critique instructional software, testing these programs on the uses of computer and allied information technologies in literacy instruction. Students will use and

257. Education and the Student Athlete. (3) Three hours of lecture/discussion per week. Students interested in a sociocultural perspective with a particular focus on the educational challenges student athletes face. Topics include theories of sport in society, the institutional relationship between sport, academia, and athletic identities, self-regulated learning and studying, academic discourse, achievement motivation, coaches as teachers, the culture of sport, and the role of race, class, and gender. Simons, Van Rheenen

258A. Issues in Educational Administration and Policy. (3) Three hours of lecture per week. (Requ.) Three hours of lecture per week. (Requ.) Prerequisites: consent of all students in the Division of Educational Administration and Evaluation.) Concepts, theories, and issues related to administration and evaluation. Application is made to governmental policy for school systems. Fuller

259A. Organization Theory in Education and Other Social Services. (3) Three hours of lecture per week. Concepts of power, authority, legitimacy, professions, controls, incentives, etc., as they apply to education or other social services. Fuller

260A. School Leadership and Management. (3) Three hours of lecture per week. (Required of students in the administrative program.) An analysis of theories of leadership, motivation, small group dynamics, organizational climate, communication, etc., associated with site leadership and management. (FSP) Staff

261A. School Leadership and Management. (3) Three hours of lecture per week. (Required of students in the administrative program.) An analysis of theories of leadership, motivation, small group dynamics, organizational climate, communication, etc., associated with site leadership and management. (FSP) Staff

262A. Curriculum Planning: Theories, Principles, and Methods. (3) Three hours of lecture and three hours of discussion per week. Special emphasis is given to the way in which policy choices—and at whatever level—shape the experience of teaching and the organization of schooling. Among the policy areas considered are those governing membership in the teaching occupation, teaching assignments, classroom autonomy regarding curriculum and instruction, personnel factors, and opportunities for professional development. This course is a requirement for Educational Administration students and those completing the Professional Administration Service. It is open to all other interested students. Little

263A. Educational Issues in Legal 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

264C. Special Topics in the Politics of Social Sector Services. (3) Course may be repeated for credit. Three hours of lecture per week. Directed research on special topics related to politics and government of education. Topics: local political consequences of federal categorical aid programs, effectiveness of intergovernmental relations strategies, formation of political reform networks in education. Staff

265A. Economics of Education and Other Social Services. (3) Three hours of lecture and three hours of conference per week. Topics to be considered include the following: alternative methods of assessing the contribution of education to economic growth; demand for education services; education production functions, cost analysis and sectorial planning, economic aspects of innovation. Grubb, Stem

265B. Economic Development and Education in the Third World. (3) Course may be repeated for credit. Three hours of lecture per week. former 255B. Prerequisites: Economics 100A-100B or Economics 101A-101B or equivalent. Human capital theory and its influence on economic planning in developing countries. The effects of educational development on the distribution of income. The role of educated women in economic development. Proposals to improve internal and external efficiency of educational systems in developing countries. The role of basic education in third world development. Staff

266A. Educational Resources and Finance. (3) Three hours of lecture per week. This course covers the resources necessary for education; financing from local, state, federal, and private sources; the effects of funding decisions on the distribution of educational resources; tax bases and their consequences; equity issues and court challenges like Serrano; and the relation between resources and outcomes. It concentrates on the funding of K-12 education, though higher education will also be included. (SP) Grubb, Stem

267A. Curriculum and Instructional Foundations. (3) One hour of lecture and two hours of discussion per week. Essentials of curriculum and instruction, planning, philosophical thought and human learning, use of taxonomies and models affecting instructional effectiveness, and approaches to evaluation in curriculum and instructional activity. Staff

267B. Curriculum Planning: Theories, Principles and Practices of Instruction. (3) One hour of lecture and two hours of discussion per week. Theories of instruction, models of teaching, research paradigms, studies and findings related to teaching effectiveness. Students are required to observe and analyze the teaching act and to conduct micro-teaching exercises. Staff

268A. The Role of Community Colleges in Higher Education. (3) Three hours of lecture per week. This course is designed for all students of higher education, including those interested in planning and social policy. The emphasis will be on the role of higher education in the development of the third world. (SP) Staff

269A. Seminar in Contemporary Higher Education: Developments, Issues, Changes. (3) Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. A seminar approach and review of current studies in higher education. Analysis of recent developments, innovations, functional inter-relation- ships, and changing issues and problems. Staff

268D. Higher Education Organization. (3) Three hours of seminar per week. Organizational analysis of higher education structures. The system structure, Research universities, and other policy issues. Bureaucratic and collegial controls. Higher education

B prefix=xlanguage course for business majors
C prefix=cross-listed course
K prefix=honors course
R prefix=course satisfies R & requirement
AG suffix=course satisfies American cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

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planning. Inter and intra politics of higher education. Topics vary to fit student interests. Staff

268E. Seminar in the History of the American College and University. (3) Three hours of lecture per week. A reading and seminar approach to the social and intellectual history of American higher education. Addressing European antecedents, institutional changes and development, growth of disciplines, the roles of faculty and student cultures, and the shifting functions of a revolution through U.S. history. Hofstetter

269. 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; in the last two decades, the focus has shifted somewhat to the potential of individual cognitive and social development. This seminar examines the place of school reform in the institutional structure of schooling and the relationship of school reform to wider political and social conflicts. Staff

269A. Urban School Reform. (3) Three hours of lecture per week. American debates about effectiveness and equity and public interest in school reform focuses on city schools, and the commitment to reform is a recurrent theme in public discussions of education. At the same time, reformers often charge that urban schools are highly resistant to their efforts. In order to understand the potential of individual reform proposals and strategies, this course examines the place of school reform in the institutional structure of schooling and the relationship of school reform to wider political and social conflicts. Staff

270B. BEAR Center Seminar. (2,3) Course may be repeated for credit. Two hours of seminar and one hour of discussion per week. This seminar constitutes one of the ways in which the Berkeley Evaluation and Assessment Research (BEAR) Center fulfills its role of supporting student research. The topic of the seminar will change from semester to semester, reflecting topics chosen by the instructor and the participants. The seminar is an opportunity for students and faculty to present their recent and ongoing work for in-depth review and commentary. In addition, visitors to the campus will be invited to present relevant to the topic under examination will be invited to present at the seminar and join in the discussion. Students taking this course for two units will make a presentation of a current research project at the end of the semester. Students taking this course for three units will also be required to attend a one-hour discussion following each presentation and will write a critique of one other student’s presentation. Wilson

271D. Methods in Educational Research and Decision-Making. (3) Three hours of lecture/discussion per week. Covers qualitative research methods and analytical models for decision-making in education. Staff

271E. Teaching and Learning in Secondary, Higher, and Adult Education. (3) Three hours of lecture/discussion per week. This course is designed for graduate students planning teaching and administrative careers in secondary, higher, and adult education. It is a basic introduction to the research and literature about teaching and learning, emphasizing the applications of research and theory for practice in the classroom. The course is divided into three broad topics: 1) learning—cognition, metacognition, and motivation; 2) assessment—measurement and evaluation, research design and research, 3) instruction—teaching effectiveness and faculty development. Staff

273A. Qualitative Evaluation and Research. (3) Course may be repeated for credit. Three hours of seminar per week. Theory and applications of the role of the evaluator as the research instrument and the nature of valuing. Detailed treatment of ethnographic, naturalistic, illuminative, historical, and connoisseurship modes of inquiry. Staff

274A. Measurement in Education and the Social Sciences I. (4) Four hours of lecture per week. Formerly Educational Psychology 208A. An introduction to classical test theory and item response theory from a conceptual and practical viewpoint. Both qualitative and quantitative aspects of assessment will be addressed. Emphasis will be placed on the appreciation of which theory-based measures and qualitative exercises in the interpretation and development of tests. 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 conceptual viewpoint. Application of these techniques to a practical measurement situation will be studied. Topics such as test bias, computerized and polytomous response modes will be discussed. 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. Seminar will address a current research issue in the area of educational and psychological measurement. Topics will vary from semester to semester. Some examples are poly- tomous item response theory, measurement of cognitive processes, and learning assessment issues. Wilson

274D. Multidimensional Measurement. (4) Four hours of lecture per week. Formerly Educational Psychology 208D. Emphasis is on understanding school reform as an organizational structure, this course addresses the functions of higher education through U.S. history. Hofstetter

276. Causal Inference in Non-experimental Designs. (3) Three hours of lecture per week. Prerequisites: 275B and 275L (may be taken concurrently) or consent of instructor. Formerly 293D. A formal analysis of various ideas related to causation with special emphasis on the problems of causal inference arising in program evaluation and the behavioral sciences more generally. Randomization, controlled experiments, and observational studies. Prospective designs as well as retrospective case-control designs. Direct causation, indirect causation. An analysis and critique of the relation of path models and latent variable models to the estimation of causal effects. Staff

276C. Practicum in Evaluation. (2-4) Course may be repeated for credit. Two hours of seminar biweekly, alternating with four-hour laboratories. Prerequisites: 293A and 293L. Formerly 293F. For students involved in an evaluation or assessment project, this course provides an opportunity for student researchers or part of a practicum or apprenticeship experience. The purpose of this course is to integrate practical experiences with evaluation theory and research literature relevant to those projects. Students will present 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. Evaluation Theory. (3) Three hours of lecture per week. Prerequisites: 276A. This course will provide students with a basic understanding of prevalent evaluation theories, with systems for categorizing these theories, and with an understanding of the processes for theory development in evaluation. Hofstetter

276E. Evaluation Procedures. (3) Three hours of lecture per week. Prerequisites: 276A. This course covers the basic stages of and strategies for conducting program evaluations within selected evaluative frameworks, such as cost-benefit analysis, utilization- oriented evaluation, theory-based evaluation, and historical evaluation. Mastery of these strategies can be demonstrated by the completion of mini-projects that focus their own evaluation studies, identify questions, develop instruments, collect data, and write/present an evaluation report. (SP) Hofstetter

280. Education, Training, and Employment. (3) Three hours of seminar per week. Theorists examine the development of occupational opportunities for schools, colleges, and training programs since the turn
of the century including school-based versus work-based learning; the effects of occupational purposes on curriculum and pedagogy; human capital theory and alternative conceptions of the contributions of education to employment; the effects of education on earnings, and on earnings inequality; and the development of a "system" of workforce development since 1938.

280A-280B. Proseminar: Sociocultural Critique of Education. (3) Three hours of seminar 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 quarter. Students spend about 50 hours on the field research. Lave, Shaiken, Stack

280C. Research Apprenticeship and Qualitative Methodology Seminar I. (3) Three hours of seminar per week. Prerequisites: 280C or consent of instructor. This is the second in a sequence of courses on the practice of the sociocultural society and the first semester students work with faculty mentors and in the seminar to carry out a field research project. Continuing both apprenticeship and seminar, this semester is devoted to analyzing the field materials and preparing a paper on the research. Lave, Shaiken, Stack

280F. Dissertation Seminar. (3) Course may be repeated for credit. Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Recommended for doctoral students preparing dissertation proposals and dissertations. Staff

281. Social Foundations of Education for Teachers. (1) Two hours of lecture/discussion per week for ten weeks. Prerequisites: Admission to a teacher education program. Relations of the American educational system; race, culture and consciousness of schools as social systems, with particular reference to the needs of teachers in training. The first meeting will be in the sixth week of the semester. Staff

282A. Families, Classrooms, and Social Change. (3) Three hours per week. Influences of social structure, process and change on classroom learning in contemporary society. Seminar discussions will focus on research and theory relating classroom learning to socialization and opportunity structures, cultural and community processes and family-classroom articulations. Staff

283B. Historical Perspectives on American Education. (3) Three hours of lecture per week. Public schooling today reflects a long evolution, producing an institution 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 examines the relationship of the changing political economy, and field research in Oakland and Berkeley schools. An examination and evaluation of current proposals for reform of urban schools will also be included. (F,SP) Staff

283G. Education and the State in Caribbean Societies. (3) Consent of instructor. This course will examine the role of education in developing societies and its relationship to popular culture. In particular, we will examine the ways in which educational institutions are responding to the emerging youth culture of the Anglophone Caribbean during a period characterized by economic and social uncertainty. We will consider how education has been incorporated into development strategies under the leadership of the governments of English-speaking Caribbean nations, and look at the role of education in the reproduction of the social structure and culture of Caribbean societies. We will also analyze how policies such as Technocratization have been used as a strategy for regime legitimation and political socialization. Students enrolled in the course will be encouraged to compare their experiences with those of the Caribbean Studies Association that will be held in May 1997, and some will be invited to submit papers for presentation at the conference. Staff

284A. Philosophy of Education. (3) Three hours of lecture per week. Philosophical analysis applied to current educational problems and key concepts. Jarrett, Tretway

285A. The School as a Workplace. (3) Three hours of lecture/discussion per week. Introduction to theory and research on the school as a professional work-place and its effects on classroom teaching, teachers' orientations to teaching, and career commitments. Topics include school-level effects on pupil progress, teachers as colleagues, structures of school-level leadership, and the workplace effects of district, state and union policies. Little

288B. Theory and Methods in Interpretive Research. (3) Three hours of lecture/discussion per week. An introduction to the theories, methods and techniques of interpretive research. Examination of the range of approaches to data analysis. Skills in the analysis of both qualitative and quantitative data. (Can be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Staff)

288C. Advanced Topics in Interpretive Research. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. An advanced topic in the theory or practice of interpretive research will be introduced and examined. Topics might include the application of interpretive research to 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. Jarrett

290A. Policy, Organization, Measurement, and Evaluation. (1-4) (F,SP) Staff

290B. Education in Language, Literacy, and Culture. (1-4) Staff

290C. Cognition and Development. (1-4) Staff

290D. Special Topic Seminar. (1-4) Staff

290E. Special Topics Seminar. (1-4) Staff

291A. The Educational System of the United States. (3) Three hours of lecture/presentation and one hour of discussion per week. Prerequisites: Graduate standing. Historical development and contemporary status of principal features of American schooling and major issues of policy and practice. The course will focus primarily upon public elementary and secondary schools. The course will stress relationships between education and other sectors of society. Grubb

291B. Education as an Institution. (3) Course may be repeated for credit. Three hours of lecture/discussion per week. A departmental core course. The environment and structure of formal education systems. Constraints surrounding schools and colleges. Impact of family, class, and media. Opportunities for employment and training for these formal systems. The bureaucratization of education and the professionalization of teaching. The role of universities to improve education. Staff

291C. Cognition, Learning, and Instruction: Ages 12 and Up. (3) Three hours of lecture/discussion per week. Focus on the various aspects of thinking and knowing, of learning, and the implications of those theoretical views on instruction. The perspective taken and elaborated on is basically constructivist. Examines are the development of knowledge, and what shapes them; compare and contrast learning and thinking in different domains; and ways in which schooling can enhance or inhibit learning. Various methodologies designed to elicit information about these issues are also explored. Frederiksen, White

291D. Cognition, Learning, and Instruction: Childhood and Adolescence. (3) Three hours of lecture per week. Examines a variety of theoretical perspectives on the nature and acquisition of knowledge, together with their implications for instruction. While a constructivist developmental perspective is emphasized, other approaches considered include behaviorism, social constructionism, and artificial intelligence. Research methods and strategies used in these approaches are discussed as well. Ammon

292A. Perspectives on the Education of Linguistic Minorities. (3) Three hours of lecture/discussion per week. The social, political, linguistic, and pedagogical issues associated with educating students who do not speak the societal language. Issues considered as they relate to the American experience, in relation to the experiences in other societies. Bilingual education, as an instructional approach to solving such problems in the United States will be examined. Staff

292B. The Logic and Politics of Curriculum. (3) Three hours of lecture/discussion per week. Analysis of selected curriculum trends in America. Examination of the "logic" (and epistemology) underlying decisions about how to teach and what to teach, e.g., "social, cultural, professional" that shapes such decisions. Case studies will examine critically the rationales for prescribed and elective curricula and treat various other curriculum "reforms." The "interrelatedness" of these systems is treated, and the responses of school professionals from the perspective of the school as a social system. Staff

292C. The Transformation of Work. (3) Three hours of seminar per week. Information technology and new forms of work organization are reshaping the workplace. This course analyzes the nature of these

B prefix=language course for business majors
C prefix=course satisfies R & R requirement
AG suffix=course satisfies American cultures requirement
H prefix=honors course
R prefix=course satisfies graduation requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
changes, the alternatives available, and the implications of technological and organizational change for education. (F,SP) Shaiken

293A. Data Analysis in Education Research. (4) Four hours of lecture per week. Prerequisites: Consent of instructor. Introduces students to quantitative statistical methods for educational research. Emphasizes parameter estimation and hypothesis testing, in particular of group differences on means, medians, proportions and correlation coefficients. Section 1 takes a conceptual and heuristic approach and includes a module on distribution free statistics. Section 2 takes an empirical approach and includes a module on multiple regression. High school algebra is strongly recommended for section 2. Staff

293L. Educational Data Analysis Laboratory. (1) Two hours of laboratory per week. Prerequisites: Must be taken concurrently with 293A. Exercises and computer programs are presented and discussed. Students work in groups on a project based on means, medians, proportions and correlation coefficients. Section 1 takes a conceptual and heuristic approach and includes a module on distribution free statistics. Section 2 takes an empirical approach and includes a module on multiple regression. High school algebra is strongly recommended for section 2. Staff

294A. Thesis Seminar—POME. (4) Course may be repeated for credit. Three hours of seminar and four hours of independent study per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Education Administration 294. Recommended for M.A. students working on seminar papers or theses, and doctoral students preparing dissertation proposals. Topic varies with instructor. Staff

294B. Thesis Seminar—ELLC. (1-6) Course may be repeated for credit. One to three hours of seminar per week. Additional units earned by completing four hours of independent research per week per unit. Prerequisites: Consent of instructor. Formerly Education in Language and Literacy 294. Recommended for students working on qualifying papers, theses, and dissertation proposals in language and literacy studies. Section 1: Recommended for Ed.D. students and M.A. students working on curriculum projects. Section 2: Recommended for Ph.D. students and M.A. students working on research projects. Staff

294C. Seminar on Formulation of Educational Research—POME. (1) Course may be repeated 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 294. Discussion of criteria for useful educational research. Emphasis is on applying these criteria while developing plans for research topics of interest to the participants. Staff

294D. Thesis Seminar—SCS. (1-4) Course may be repeated for credit. One to three hours of seminar per week. Additional units earned by completing four hours of independent research per week per unit. Prerequisites: Consent of instructor. Formerly Social and Cultural Studies in Education 294. Recommended for degree students working on seminar papers, theses, or dissertation proposals. Topics include the adoption of a thesis topic, research design, statistical analysis. Staff

294E. Thesis Seminar. (1-4) Course may be repeated for credit. Three hours of discussion per unit per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Educational Psychology 294E. Recommended for M.A. students working on seminar papers or theses, and doctoral students preparing dissertation proposals.

295A. Exploring Mathematics and Science with Computers. (3) Two hours of lecture and three hours of laboratory per week. Formerly Education in Mathematics, Science, and Technology 291A. Provides in-depth material through an exploratory approach made possible by computers. Students learn mathematics, engage in mathematical invention and discovery and reflect on the role of computation in making it all happen effectively. Mathematical topics include elementary number theory, topology of planar paths, geometry on curved surfaces, and Einstein’s General Theory of Relativity. Some elementary programming recommended. diSessa

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 incorporating technological delivery of instruction will be developed. Linn

296. Internship in Math, Science and Technology Education. (1-4) Course may be repeated once for credit. Two hours of seminar every other week and three to ten hours of laboratory per week. Internship on an educational research or development project on the UC campus or at a nearby cooperating institution such as the Exploratorium, Oakland Museum, etc. Two hour meeting bi-weekly to discuss the students’ experiences. 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. One hour of lecture per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Research on special problems and topics not covered by regular courses or seminars. Topics will vary in different semesters. (F,SP) Staff

298B. Group Study for Graduate Students—ELLC. (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. Prerequisites: Consent of instructor. Formerly Education in Language and Literacy 298. Research on special problems and topics not covered by courses or seminars. Staff

298C. Group Study, Seminars, or Group Research—DCEMST. (1-4) One to four hours of lecture/seminar per week. Formerly Education in Mathematics, Science, and Technology 298. Advanced group study in an area of concentration. Students to meet bi-weekly to discuss the students’ experiences. Staff

299. Special Study and Research. (1-12) Course may be repeated for credit. One to twenty hours of independent study per unit. Can be repeated for credit. Formerly Educational Psychology 299. Course is satisfactory/unsatisfactory. Prerequisites: Admission to a teaching credential program in English. This course will introduce students to the best practice involving existing technologies for the teaching of English, as well as cutting-edge technologies that are not widely available in schools today but that hold promise for the teaching of writing, language, and literature. Throughout the course, issues of equity and access will be addressed, and special attention will be given to using new technologies to their best advantage in multilingual, multilingual classrooms. Hull

300. Teaching Assistants Practicum. (1-6) Course may be repeated for credit. One half-hour lecture, one 3/4-hour discussion and one hour field work per unit per week. Must be taken on a satisfactory/unsatisfactory basis. Consultation and analysis for teaching assistants. Staff

390A-390B. Supervised Teaching for CLAD English Program. (7.6) Credit and grade to be awarded on completion of sequence. Prerequisites: Admission to a teaching credential program. Formerly Education in Language and Literacy 390A-390B. Twenty-four to twenty-eight hours of supervised teaching in public school classrooms and one hour of lecture per week. Sequence begins with the fall semester. Cziko

390C. Supervised Teaching in Elementary Education. (1-8) Course may be repeated for credit. One to three hours of lecture and two to twenty hours of fieldwork per week. Prerequisites: Admission to a teaching credential program. Formerly Education in Language and Literacy 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. Peretti

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 ten hours of fieldwork per week. Prerequisites: Admission 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

413A-413B. Community-Based Internship in School Psychology. (3-3) Course may be repeated for credit. Two hours of lecture/discussion and one hour of fieldwork per week. Supervised assignment to a community mental health agency in the capacity of a school psychologist. (F,SP) Singh

413C-413D. School-Based Internship in School Psychology. (6-6) Course may be repeated for credit. Two hours of lecture and three days of fieldwork per week. Supervised assignment to a school district in capacity of school psychologist. Staff

413L. Consultation for School Psychology Students. (1) Course may be repeated for credit. One hour consultation on campus and six hours of field work per week. Must be taken on a satisfactory/unsatisfactory basis. Staff

Professional Courses

340A-340B. Foundations for Secondary School English. (2.2) Two hours of lecture per week. Credit and grade to be awarded on completion of sequence. Prerequisites: Admission to English Credential Program of Bay Area Writing Project. Internship teaching the secondary school English curriculum, with emphasis on the teaching of composition. Staff

341. Teaching Writing in Secondary School. (3) Course may be repeated for credit. Three hours of lecture and seminar/workshop per week plus 24 hours of seminar/workshop per week during the semester break. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Admission to English Credential Program. Formerly 242. Comprehensive description and demonstration of theoretical approaches and specific lessons for teaching and improving writing in secondary schools; includes frequent and extensive writing and discussion of cases. Staff

343. Technology and the Teaching of English. (2) Two hours of lecture and three hours of laboratory per week. Prerequisites: Admission to the Single Subject Credential Program in English. This course will introduce students to the best practice involving existing technologies for the teaching of English, as well as cutting-edge technologies that are not widely available in schools today but that hold promise for the teaching of writing, language, and literature. Throughout the course, issues of equity and access will be addressed, and special attention will be given to using new technologies to their best advantage in multilingual, multilingual classrooms. Hull

208 / Education
Electrical Engineering and Computer Sciences (College of Engineering)

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Chair: Shahnaz粕, Ph.D.

University Professor

John R. Whinnery (Ementus). Ph.D. University of California, Berkeley. Communications applications of lasers

Professors

Venkatachalam Anantharam, Ph.D. University of California, Berkeley. Systems and control

*Charles B. Kenney, Ph.D. Stanford University. Plasmas

Jeffrey Bolot, Ph.D. Stanford University. Nanodevices


Robert W. Brodersen (John R. Whinnery Professor of Electrical Engineering and Computer Sciences). Ph.D. Stanford University. Computer-aided design, processing applications

Constance D. Hoganas, Ph.D. University of California, Berkeley. Electronic devices and fabrication techniques

Nathan Cheung, Ph.D. California Institute of Technology. Electronic and Photonic devices

Leon O. Chua, Ph.D. (Hon.) University of Illinois. Device modeling, phenomenology, and applications

Ronald S. Fearing (Vice Chair, Undergraduate Matters). Ph.D. Stanford University. Bio-inspired robotics

Paul R. Gray (The Executive Vice Chancellor and Provost). Ph.D. University of Arizona. Integrated circuits and devices

T. Kenneth Gustafson, Ph.D. Massachusetts Institute of Technology. Quantum and nonlinear optical processes

Thomas A. Henzinger, Ph.D. Stanford University. Computer-aided design for microelectronics

* David A. Hodges, Ph.D. University of California, Berkeley. Integrated circuits

Roger T. Howe, Ph.D. University of California, Berkeley. Microprocessors and microarchitectures

Chenming Hu (Taiwan Semiconductor Manufacturing Company Distinguished Professor in Microelectronics). Ph.D. University of California, Berkeley. IC materials and devices

Joseph Kahn, Ph.D. University of California, Berkeley. Optical communications

Kurt Keutzer, Ph.D. University of California, Berkeley. Computer-aided design, simulation, computer-aided design, architectural design, formal verification

Kam Y. Lau, Ph.D. California Institute of Technology. Microelectronics

Edward A. Lee, Ph.D. University of California, Berkeley. Signal processing, digital communications

* Alan J. Litchenberg, Ph.D. Stanford University. Plasma astrophysics, energy resources

* Michael A. Lieberman, Ph.D. Massachusetts Institute of Technology. Computer architecture, computer systems

David G. Messerschmitt (Roger A. Strauch Professor of Engineering, IBM Fellow). Ph.D. University of Michigan. Signal processing and networking

Robert G. Meyer, Ph.D. University of Melbourne. IC design and device technology

*Richard S. Muller, Ph.D. California Institute of Technology. Integrated sensing devices

Andrew R. Neureuther (Adjunct). Ph.D. University of Illinois. Integrated circuit process

A. Richard Newton (Dean). Ph.D. University of California, Berkeley. Computer-aided design, computer architecture

William G. Oldford (Distinguished Professor in Electrical Engineering and Computer Sciences). Ph.D. University of California, Berkeley. Computer science, computer architecture, semiconductor microprocessors

Albert P. Pisano, Ph.D. Massachusetts Institute of Technology. Microelectronics, computer-aided design

Christian Fraczkiewicz, Ph.D. University of California, Berkeley. Optimization and control

* Jan M. Rabey (Associate Chair, Electrical Engineering). Ph.D. Katholieke Universiteit, Leuven. Microelectronics, computer-aided design

*Alberto L. Sangiovanni-Vincentelli (Edward L. and Harold H. Butner Professor of Electrical Engineering). Dr. Ing. Politecnico di Milano. VLSI circuits and systems

S. Shankar Sastry (Chai) Ph.D. University of California, Berkeley. Robotics, robotics and computational systems, control

Charles E. Schwab, Ph.D. University of California, Berkeley. Ultrashort light pulses

Costas Spanos, Ph.D. Carnegie-Mellon University. Computer networks, computer architecture


Pravin P. Varaiya (Robert H. N. Young Professor in EECS). Ph.D. University of California, Berkeley. Communication Networks

Jean Walrand, Ph.D. University of California, Berkeley. Communication Networks

William J. Welch III, Ph.D. University of California, Berkeley. Radioastronomy

Richard M. White, Ph.D. Harvard University. Semiconductors and superconductors

Pravin P. Varaiya (Robert H. N. Young Professor in EECS). Ph.D. University of California, Berkeley. Communication Networks

*Joseph Zai, Ph.D. Massachusetts Institute of Technology. Digital signal processing and its applications

V. Ralph Algazi, Ph.D. (Ementus)


Charles A. Deves, Ph.D. (Ementus)

Andrew J. Diannes, Ph.D. (Ementus)

Albert C. English, Ph.D. (Emeritus)

Martin H. Graham, D.Eng (Eer) (Emeritus)

Elash A. Jury, Sc.D., Dr.Sc. Techn. (Hon.) (Emeritus)

Edward L. Kelley, Ph.D. (Ementus)

Ernest S. Kuh (William S. Floyd, Jr., Professor of Engineering Emertus). Ph.D. (Ementus)

*Tedwin R. Lewis, Ph.D. (Emeritus)

Kenneth K. Mei, Ph.D. (Emeritus)

Donald O. Pederson, Ph.D. (Hon.) (Edgar L. and Harold H. Butner Professor of Electrical Engineering)

Steven E. Schwarz, Ph.D. (Emeritus)

Jerome R. Singir, Ph.D. (Ementus)

David H. Sloan, Ph.D. (Emeritus)

Oto J. Smith, Ph.D. (Emeritus)

Charles Sassur, Ph.D. (Emeritus)

Arjan J. Thomasian, Ph.D. (Emeritus)

George L. Turner, Sc.D. (Hon.)

Eugene Wong, Ph.D. (Emeritus)

* Felix F. Wu, Ph.D. (Emeritus)

* Associate Professor

Bernhard E. Boser, Ph.D. Stanford University. Integrated circuits, neural networks

Tsu-Jae King, Ph.D. Stanford University. Semiconductor materials and devices

Kristine S. J. Pister, Ph.D. University of California, Berkeley. Micro/nanoelectromechanical systems

Annandale R. Chalmers, Ph.D. University of California, Berkeley. Signal processing and communications

* Seth S. Sanders, Ph.D. Massachusetts Institute of Technology. Nonlinear circuits and systems

John J. Smith, Ph.D. Stanford University. Control theory

* David Tse, Ph.D. Massachusetts Institute of Technology. Networking

* Acting Associate Professor

Laurent El Ghaoui, Ph.D. Stanford University. Optimization

* Assistant Professor

Borivoj Nikolic, Ph.D. University of California, Davis. Digital integrated circuits

Vivek Subramanian, Ph.D. Stanford University. Microelectronic devices

* Affiliated Professors

David Attwood, D.Sc. (In Residence)

Thomas F. Budinger, M.D. Ph.D. (In Residence)

Stephen F. DeSantis, Ph.D. (Adjunct)

Maria D. Dilbenet, Ph.D. (Adjunct)

Nelson Morgan, Ph.D. (Adjunct)

Martin Vetterli, Doctoral es Sc (Adjunct)

Stephen Whitehead, Ph.D. (Adjunct)

* Jerold E. Marsden, Ph.D. Stanford University. Optimization

Lawrence Stark, M.D. (Emeritus)

Computer Science Division

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http://http.cs.berkeley.edu/

University Professor

*Richard M. Karp (Class of 39 Professor Emeritus). Ph.D. Harvard University. Analysis of algorithms

Professors

Brian Barsky, Ph.D. University of Utah. Graphics, visualization in scientific computing

Erella B. Kerkel, Ph.D. Massachusetts Institute of Technology. Algebraic coding theory, combination game theory


* John F. Canny, Ph.D. Massachusetts Institute of Technology. Robotics

* David E. Culler, Ph.D. Massachusetts Institute of Technology. Parallel computation

James W. Demmel (Dr. Richard Carl Dehmel Distinguished Professor in the College of Engineering). Ph.D. University of California, Berkeley. Linear algebra, scientific computation

* Richard J. Fateman, Ph.D. Harvard University. Symbolic and algebraic manipulation

Jerome A. Feldman, Ph.D. Carnegie-Mellon University. Artificial intelligence

* Susan L. Graham, Ph.D. Stanford University. Programming language semantics

Michael Jordan, Ph.D. University of California, San Diego. Machine learning, applications

William Kahan, Ph.D. University of Toronto. Automatic symbolic mathematical manipulation

* Randy H. Katz (United Microelectronics Corporation Distinguished Professor). Ph.D. University of California, Berkeley. Computer architecture, programming languages

* Jitendra Malik, Ph.D. Stanford University. Artificial intelligence

Christos H. Papadimitriou (Associate Chair, Computer Sciences and Electrical Engineering). Ph.D. University of California, Berkeley. Computer science, computer architecture

* David A. Patterson (E. H. and M. E. Pardee Professor). Ph.D. University of California, Los Angeles VLSI computer architecture

Lawrence A. Rowe, Ph.D. University of California, Irvine. Programming systems and implementation

Stuart Russell (Chancellor’s Professor). Ph.D. Stanford University. Artificial intelligence

*Professor of the Graduate School

†Recipient of Distinguished Teaching Award
Robert J. Wilensky
John C. Wawrzynek, Ph.D. California Institute of
Alan J. Smith, Ph.D. Stanford University. Operating systems,
Alistair Sinclair, Ph.D. University of Edinburgh. Computer
putation, computer architecture, computer graph-
artificial intelligence, complexity, theory of com-

The Computer Science and Engineering program
Hall. Details about the computer science major of-

The CS Major and Minor,
College of Letters and Science, see the booklet
and Science (B.A. degree). For information about
Engineering (B.S. degree) or the College of Letters
Science (Emeritus)
(Vice Chair, Computing and Networks)
Ph.D. Yale University. Artificial intelligence

*Lotfi A. Zadeh, Ph.D.

Domenico Ferrari, Dr. Ing.

Chittoor V. Ramamoorthy, Ph.D.

Beresford N. Parlett, Ph.D.

Anthony Joseph, Ph.D. Massachusetts Institute of
Assistant Professors
Satish Rao, Ph.D. Massachusetts Institute of Technology.
Joseph M. Hellerstein, Ph.D. University of Wisconsin. Design
Michael Franklin, Ph.D. University of Wisconsin. Database
David A. Forsyth, D.Phil. Oxford University. Artificial intelli\nMichael Franklin, Ph.D. University of Wisconsin. Database
management
Kenneth Goldberg, Ph.D. Carnegie Mellon University.
Robotic and geometric algebra
Joseph M. Hellerstein, Ph.D. University of Wisconsin. Design
of database management systems
Paul N. Hilfinger, Ph.D. Carnegie-Mellon University.
Programming languages, concurrent programming
Salks Ral, Institute of Technology. Theoretical computer science
Katherine V. Ramamoorthy, Ph.D. Massachusetts Institute of
Technology. Programming languages, methodologies

Assistant Professors
Anthony Joseph, Ph.D. Massachusetts Institute of Technology. frameworks for mobile
computing applications
John Kubiatk, Ph.D. Massachusetts Institute of Technology. Multiprocessor computer architecture and
systems
James Landay, Ph.D. Carnegie-Mellon University. User interface construction systems
George Necula, Ph.D. Carnegie-Mellon University. Programming languages and computer system research
James D. O’Brien, Ph.D. Institute of Technology. Computer graphics and animation
Jonathan Shevuch, Ph.D. Carnegie-Mellon University. Scientific computing, computational geometry and
computer geometry
Iot Stofa, Ph.D. Carnegie-Mellon University. Networking and distributed computer systems
Luca Trevisan, Ph.D. University. Theoretical computer science
David Wagner, Ph.D. University of California, Berkeley. Computer security, cryptography, systems, theory

Senior Lecturers
Michael J. Clancy, B.S.
Brian Harvey, Ph.D.

Department Overview
With rapid growth in technology, electrical engi-
neering now encompasses solid-state devices, in-
egrated circuits, microwave electronics, quantum and
optical electronics, bioelectronics, radiation and
propagation, plasmas, power systems, control sys-
tems, communications and information theory, cir-
cuit theory, large-scale networks and systems,
computer-aided design, microelectromechanical systems, digital signal processing, robotics, and
pattern recognition.

The department offers programs in computer sci-
ence through its Computer Science Division. Under-
graduates who wish to major in computer science
may do so in either of the programs: The College of
Engineering (B.S. degree) or the College of Letters
and Science (B.A. degree). For information about
the computer science programs offered through the
College of Letters and Science, refer to the booklet
The CS Major and Minor, which is available from the
Computer Science Advising Office, 377 Soda Hall. Details about the computer science major of-
ered through the College of Letters and Science may be found under Computer Science.

The Computer Science and Engineering program includes such topics as analysis of algorithms,
artificial intelligence, complexity, theory of com-
putation, computer architecture, computer graph-
ics and geometrical modeling, database manage-
ment systems, formal languages and automata
theory, information theory, numerical analysis, par-
allel and scientific computation, performance anal-
ysis, programming languages and compilers, op-
erating systems, robotics, computer vision, soft-
ware engineering, and symbolic algebraic manip-
ulation.

Beyond satisfaction of the minimum requirements for the B.S. degree in EECS, students follow one of
two basic paths in completing their major program in Electrical and Computer Engineering or Computer
Science and Engineering. They may select a Gen-
eral Electrical Engineering and Computer Sciences Option in which they will receive an introduction to
a large number of the areas outlined above. Al-
ternatively, they may emphasize particular subject
areas by choosing one of the four main options in
the Department of Electrical Engineering and Com-
puter Sciences: electronics, communication, net-
works and systems, computer systems, and com-
puter science. Or they may plan an individual
program to suit their special needs or background.

Students take elective units in engineering, phys-
cal or life sciences, mathematics and statistics in
order to strengthen and broaden their background
and to satisfy some of the requirements in these
areas. The upper division program includes a se-
lection of courses in electronics, communications,
networks and systems, computer systems, and
computer science. Descriptions of the courses can
be found in the Announcement of the College of
Engineering. Students should also consult the Un-
dergraduate Notes published by the Electrical En-
gineering and Computer Sciences Department.

The Electrical and Computer Engineering program is accredited by the Engineering Accreditation
Board for Engineering and Technology (ABET),
111 Market Place, Suite 1050, Baltimore, MD 21202-4012; (410) 347-7700. The Computer Sci-
ence and Engineering Program is accredited by the
Computer Science Accreditation Commission of
ABET.

Undergraduate Program
The department offers two programs: Electrical and Computer Engineering (ECE) and Computer Sci-
ence and Engineering (CSE). Students working for the
B.S. degree select an option within their pro-
gram; they are then assigned an appropriate ad-
viser on the basis of their selection. Students in
both programs will pursue the following objectives:

• Gain the ability to analyze and solve electrical and
computer engineering problems through application
of fundamental knowledge of mathematics, sci-
ence, and engineering.
• Gain the ability to identify, formulate, and solve
challenging engineering problems.
• Learn to apply modern skills, techniques, and en-
gineering tools to create electronic systems.
• Learn to communicate their ideas to be effective
in collaboration with other members of engineering
teams.
• Acquire the background in humanities and social
sciences required to be effective as engineers,
leaders, and citizens.
• Achieve an understanding of conceptual foun-
dations and emerging applications over a broad
range of electrical engineering, computer engi-
neering, and computer science subjects.
• Gain professional maturity through selection of
their individual courses of study.

Electrical and Computer Engineering Program
The ECE options (described below) include Option I (Electronics), Option II (Communication, Net-
works, and Systems), Option III (Computer Sys-
tems), and Option V (General). (Option IV falls un-
der the Computer Science and Engineering Program, below.) Students are encouraged to de-
velop an individual program in consultation with
their faculty adviser. The transcripts of students in
these options indicate that their degree is from
the Electrical and Computer Engineering Program.

Computer Science and Engineering Program
The CSE Program includes Option IV (Computer Science), described below. The transcripts of stu-
dents in Option IV indicate the major discipline of
Computer Science and Engineering Program.

Options
Electronics (Option I) is for students interested in
integrated circuits, including fabrication technology,
solid state devices, digital and analog circuits anal-
ysis and design, VLSI design, and computer-aided
design and manufacturing; and for students inter-
ested in microelectromechanical systems, elec-
tromagnetics, acoustics, opoelectronics, plasmas,
cryoelectronics, and antennas and propagation.

Communication, Networks, and Systems (Op-
tion II) is for students interested in networks, con-
trol, robotics, digital and analog communications,
computer networks, signal processing, systems de-
sign and optimization, and power systems planning
and operation; and for students interested in biol-
ogy, medicine as well as electrical engineering,
including biological sensors and signals, signal
and image processing, and analysis and modeling of
biological systems.

Computer Systems (Option III) is for students in-
terested in computer-aided design and logical design
of computer systems, database systems, program-
ning languages and systems, and digital devices and
circuits.

Computer Science (Option IV) is for students in-
terested in design and analysis of algorithms, com-
plexity theory and other theoretical topics, artificial
intelligence, and computer graphics.

General Option (Option V) is for students whose
interests are broad or are not yet focused on a
specific field. This flexible option enables students
to explore several areas of electrical engineering
and computer sciences.

Double Majors
In addition, the department offers double major pro-
grams designed to help students qualify for em-
ployment in either of two major fields of engineer-
ing, or for positions where competence in both
fields is required. Both majors are listed on the stu-
dent’s transcript. Two such double majors are cur-
rently established:

EECS/Materials Science and Engineering: For
students interested in materials and devices, a
double major in EECS/MSIE can be valuable. The
program combines the study of materials from a
broad perspective, as taught in MSIE, with the
study of their applications in electronic devices and
circuits, as taught in EECS.

EECS/Nuclear Engineering: The EECS/NE dou-
ble major combines the traditional EE program with one
in the nuclear sciences. Nuclear engineering shares
with EE a concern for electrical power genera-
tion, automatic control, computer sciences, and
plasmas.
Curriculum for the Bachelor's Degree

A minimum of 120 semester units is required for the Electrical Engineering degree in EECS, including: At least 30 units of natural science, mathematics, and statistics, including:

1. (a) At least 11 units of natural science, including Physics 7A-B or H7A-H7B, and one course chosen from among the following:
   - Physics 7C or 7HC (recommended), Chemistry 1A (recommended), Biology 1A (recommended), Astronomy 10A, 10B, Chemistry 1B, 3A-3B, 4A-4B, and 5, Molecular and Cell Biology 32/3L, or an upper division course in astronomy, biology, chemistry, geology and geophysics, integrative biology, molecular and cell biology, physics or plant biology.
   - Math 1A-1B, 53, and 54.
   - A course in discrete mathematics and/or probability and statistics. Math 55 or CS 70 is required for students following Option III (Computer Systems) or Option IV (Computer Science). Students following Option I (Electronics), Option II (Computer Science), or Option V (General) may substitute a course on probability and statistics chosen from the following list: Stat 20 (permitted for junior transfer students taken at a community college only), Stat 25, Stat 26, EECS 126. EECS 126 counts as upper division EECS units under requirement 2, and the other courses in this list count as mathematics and statistics credits under requirement 1.

2. A total of 45 units of engineering courses, including at least 20 units of upper division EECS courses. A student may count any graded course (lower or upper division) in the College of Engineering toward the 45-unit requirement. We encourage students to consider taking courses outside the department. In the past, we have found the following courses to be of particular interest:
   - CEE 105 and 130; E36, 45, 66, 115, 118, 120, 166, 177; MSE 102 and 111; ME 102A, 104, 135, and 136; and NE 101 and 107. This list is suggestive, not exclusive.

3. An upper division engineering course providing a major design experience based on the knowledge and skills acquired in earlier coursework and incorporating engineering standards and realistic constraints. Examples include: Material and System Design (for requirement 2). The current EECS design courses are EE 123, EE 128, EE 141, EE 143, EE 145L, EECS 145M, CS 152, CS 160, CS 162, CS 164, CS 166, EE 181A, EE 205D, and EE 192. A course in other engineering departments having substantial engineering design content may be substituted by petition.

4. Courses that satisfy the Subject A, Humanities and Social Studies, American Cultures, and American History and Institutions requirements in effect at the time of admission.

5. Courses to satisfy requirements 1-3 must be taken for a letter grade.

6. No more than 3 units of English as a Second Language, 4 units of physical education, or 10 units of Course 199 (independent study and research) may be counted toward the degree.

7. You may earn a total of at most 5 units of credit toward graduation for courses labeled as “computing service” courses, which include CS 3, the CS 9 courses, and IDS 10. You will receive course credit but not more than 1 unit of credit for each computing service 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 purpose of determining whether your study list falls within the minimum and maximum unit loads.

Note: Details of the undergraduate degree program and its options are available in the Announcement of the College of Engineering and in the Electrical Engineering and Computer Sciences Undergraduate Notes.

Graduate Program

To prepare graduate students for work in the rapidly developing fields of electrical engineering and computer sciences, the department offers a wide selection of courses, seminars, and flexibility in meeting degree requirements. Since no single sequence of courses is required, students are free to design programs that suit their particular needs and interests, in consultation with a faculty adviser in their field.

Graduate degree programs are available as preparation for research and teaching (Master of Science and Doctor of Philosophy), and for careers in design, development, and management (Master of Engineering and Doctor of Engineering). The Master of Science program requires two-three semesters of study. Students normally complete the Doctor of Philosophy program in five years. The Master of Engineering program requires four semesters of study and includes a minor in a technical subject outside the major and a second minor in a nontechnical subject such as law, business administration, etc. The Doctor of Engineering program, of about two years duration, builds on the course work for the Master of Engineering and requires a one-year internship in a design and development organization. Students with either a B.S. or an M.S. who intend to study for the D.Eng. should apply first for the M.Eng. program.

Details of the available fields of graduate study in electrical engineering and computer sciences are described in the Announcement of the College of Engineering. For further information on graduate courses, programs and procedures, see the Electrical Engineering and Computer Sciences Graduate Information Notes, available in 395 Cory Hall and at http://hera.eecs.berkeley.edu/GradNotes/grad_notes.html.

Computing Service Courses

You may earn a total of at most 5 units of credit toward graduation for courses labeled as “computing service” courses, which include: CS 3, the CS 9 courses, IDS 110 and 110L, and Engineering 77N. You will receive no more than 1 unit of credit for each computing service 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 purpose of determining whether your study list falls within the minimum and maximum unit loads.

Note: In addition to the courses listed below, the Department of Electrical Engineering and Computer Sciences offers the following courses, found in the Engineering section of this catalog: Engr. 205, Engineering Design Studio; 160, Energy and Power; 186, Engineering Management; 233, Applications of Parallel Computers; 235, Sparse Matrix Methods.

Electrical Engineering

Lower Division Courses

1. EECS: The First Course. (2) One hour of lecture and two hours of laboratory per week. Introduction to engineering concepts and techniques in general, and to forefront topics in electrical and computer sciences in particular, involving hands-on experimentation, lectures, demonstrations, readings, and practice with written and oral communication. Course interface for first-year undergraduates. White

204N. Structure and Interpretation of Systems and Signals. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: Mathematics 1B. Mathematical modeling of signals and systems. Continuous and discrete signals, with applications to audio, images, video, communications, and control. State-based models, beginning with automata and evolving to LTI systems. Frequency domain models for signals and frequency response for systems, and sampling of continuous-time signals. A Matlab-based laboratory is an integral part of the course. (F.SP) Lee

39. Freshman/Sophomore Seminar. (2-4) Course may be repeated for credit as topic varies. Two to four hours of seminar per week. Sections 1-2 to be graded on 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 area of interest under the guidance of 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) Howe

40. Introduction to Microelectronic Circuits. (4) Students will receive no credit for 40 after taking 100. Three hours of lecture, three hours of laboratory, and one hour of discussion per week. Prerequisites: Mathematics 1B and Physics 7B. Basic circuit concepts and analysis techniques in the context of digital electronic circuits. Transient analysis of CMOS logic gates; basic integrated-circuit technology and layout. (F.SP) How

42. Introduction to Electronics for Computer Science. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 43 (may be taken concurrently); Mathematics 1B. Fundamental principles of electronics with emphasis on those of particular interest to students of computer science. Electric circuits; analysis of passive dc circuits; equivalent circuits; power calculations; inductance and capacitance; sinusoidal steady-state analysis; frequency response; transient response of first-order circuits; time constants. Digital blocks. Field-effect transistors; MOS-FETs; CMOS technology; CMOS logic devices; other logic families. (F.SP) Staff

43. Introductory Electronics Laboratory. (1) Two hours of laboratory/demonstration per week. Must be taken on a passed/not passed basis. Prerequisites: 42 (may be taken concurrently) or equivalent or consent of instructor. Using and understanding electronic laboratory equipment such as oscilloscope, power supplies, function generator, multimeter, curve-tracer, and RLC-meter. Includes a term project of constructing and testing a robot or other appropriate electromechanical device. (F.SP) Staff

Upper Division Courses

100. Electronic Techniques for Engineering. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Mathematics 1B, Physics 7B. Analysis of passive circuit elements and linear time-invariant systems, impedance and admittance, frequency response, transient response, operational amplifiers, digital building blocks, digital systems, microprocessor control, power systems and machines. This course is not for students majoring in Electrical Engineering. (F.SP)

104. Linear and Nonlinear Circuits. (5) Four hours of lecture and two hours of discussion per week. Pre-
112. Introduction to Digital Communication Systems. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 117. Discrete time signal processing. Channel coding, error correction, modulation, digital signal processing. (F,S) Fearing, Kahn

120L. Signals and Systems Laboratory. (1) Three hours of laboratory every other week. Prerequisites: May be taken concurrently with 120. Hands-on experiments designed to provide physical examples for the theoretical concepts of 120. Time- and frequency-domain experiments on linear systems, periodic and transient signals, modulation and demodulation, sampling, reconstruction and aliasing. Representative applications include active filters, AM, FM, feedback control, and digitized speech. (F,S) Fearing, Kahn

121. Introduction to Digital Communication Systems. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 120, 126. Introduction to the basic 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 design of digital telecommunication and digital wireless communication systems. Concepts illustrated by a sequence of MATLAB exercises. (SP) Tse

122. Introduction to Communication Networks. (3) Three hours of lecture per week. Prerequisites: 104. Introduction to electric power systems with emphasis on the transmission network. Load flow analysis and control. Economic operation and stability analysis, and synchronization. Short-circuit analysis. (SP) Staff

123. Digital Signal Processing. (4) Three hours of lecture, one hour of discussion, and one hour of laboratory per week. Prerequisites: 121. Discrete time signals and systems; Fourier and Z transforms, DFT, 2-dimensional versions. Digital signal processing topics: flow graphs, realizations, FFT, chirp-Z algorithms, Hilbert transform, bandpass and band-stop filters, linear prediction. Digital filter design methods: windowing, frequency sampling, S-to-Z methods, frequency-transformation methods, optimization methods, 2-dimensional filter design. (SP) Staff

C125. Introduction to Robotics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 120 or equivalent, consent of instructor. An introduction to the kinematics, dynamics, and control of robot manipulators, robotic vision, sensing, and the programming of robots. The course will cover forward, inverse kinematics of serial chain manipulators. The manipulator Jacobian, force relations, dynamics, and control-position, and force control. Trajectory generation, collision avoidance, automatic planning of fine and gross motion strategies; robot programming languages. Proximity, tactile, and force sensing. Network modeling, stability, and fidelity in teleoperation. Biological analogs and medical applications of robotics. Also listed as Bioengineering C125, (F,S) Sastry, Tendick


128. Feedback Control. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 120. Analysis and synthesis of continuous and sampled-data linear feedback control systems. Advantages of feedback. Design by root locus, frequency response, and state space methods, with a comparison of techniques. Case studies. (F) Sanders

193. Neural and Nonlinear Information Processing. (3) Three hours of lecture per week. Prerequisites: 120 or consent of instructor. Neural networks, concepts of 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) Chua

130. Integrated-Circuit Devices. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 40 or 100. Overview of electronic properties of semiconductor. Metal-semiconductor contacts, pn junctions, bipolar transistors, and MOS field-effect transistors. Properties that are significant to device operation and microwave and high-speed device design. (SP) Bokor

C133. Microfabrication Equipment Laboratory. (2) One hour of lecture and three hours of laboratory per week. Prerequisites: 40 or 100, Mathematics 53 and 54, Physics 7B; an upper division course on microfabrication technology is recommended but not required (e.g., Chemical Engineering 179, Electrical Engineering 143, Mechanical Engineering 110, 122, Materials Science 111, 123, 125). Experimental setup and simulations illustrating the fundamental principles of equipment and measurement technology for microelectronic and microelectromechanical fabrication and manufacturing. The experiments involve investigation and measurements of high vacuum systems, plasma-assisted etching and film deposition, high temperature silicon oxidation, photolithography, spin coating, chemical-mechanical polishing, and electroplating. Also listed as Electrical Engineering C123, Materials Science and Engineering C133, and Chemical Engineering C133. (SP)

140. Linear Integrated Circuits. (4) Three hours of lecture and one hour 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 dependent biasing and references. Selected applications of analog circuits such as analog-to-digital converters, switched capacitor filters, and comparators. The laboratory builds on concepts presented in the lectures and provides hands-on design experience and help with the use of computer aided design tools such as SPICE. (F,S) Staff

141. Introduction to Digital Integrated Circuits. (4) Three hours of lecture, one hour of discussion, and two hours of laboratory per week. Prerequisites: 104 and 110 recommended. 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: cost, reliability, performance, and power dissipation. Sequential circuits, timing considerations, and clocking approaches. Design of large system blocks, including arithmetic, memory, and graphically programmable logic arrays. Introduction to design methodologies, including hands-on experience. (F) Rabaey

212 / Electrical Engineering and Computer Sciences
142. Integrated Circuits for Communications. (4)
Three hours of lecture and one hour of discussion per week. Prerequisites: 120 and 140. Analysis and design of electronic circuits for communication systems with an emphasis on integrated circuits for wireless communication systems. Analysis of distortion in amplifiers with application to radio receiver design. Power amplifiers with application to wireless radio transmitters. Class A, Class B, and Class C power amplifiers. Radio-frequency mixers, oscillators, phase-locked loops, modulators, and demodulators. (F) Meyer

145A. Sensors, Actuators and Electrodes. (4)
Three hours of lecture and one hour of discussion per week. Prerequisites: 40 plus elementary chemistry and physical chemistry. Sensing and control of the physical bases of transduction, detection of signals in the presence of noise, applications of lumped- and distributed-parameter network theory to design and analysis of sensor and actuator systems. Optics, techniques of higher frequencies, thermodynamics, chemical dynamics, and electrochemistry. Electrochemical bases of electrodes. Biological sensors and actuators. (F) Staff

C145B. Image Processing and Reconstruction Tomography. (4)
Three hours of lecture and one hour of discussion per week. Prerequisites: 120; basic programming ability in C or FORTRAN. Linear systems and Fourier transforms in two and three dimensions. Basic image processing. Theory and algorithms for image reconstruction from projections. Physics of imaging systems including magnetic resonance, X-ray tomography, positron emission tomography, ultrasound, and biomagnetic imaging. Data analysis including hypothesis testing, parameter estimation, and compartmental modelling. Field trips to medical imaging laboratories. Also listed as Biomedical Engineering C165. (SP) Budinger

145L. Introductory Electronic Transducer Laboratory. (3)
Two hours of lecture and three hours of laboratory per week. Prerequisites: 40. Laboratory exercises exploring a variety of electronic transducers for measuring physical quantities such as temperature, force, displacement, sound, light, ionic potential; correlation between the physical process and electrical/mechanical performance. MOS transistors and linear circuits will be demonstrated in the laboratory and evaluated. (F,SP) Cheung, King

145M. Introductory Microcomputer Interfacing Laboratory. (3)
Two hours of lecture and three hours of laboratory per week. Prerequisites: 40 and 60B. Laboratory exercises constructing basic interfacing circuits and writing 20-100 line C programs for data acquisition, storage, analysis, display, and control. Use of the IBM PC with microprogrammable digital counter/timer, parallel I/O port, and analog I/O port. Circuit components include anti-aliasing filters, the S/H amplifier, A/D and D/A converters. Laboratory exercises include effects of antialiasing in periodic sampling, fast Fourier transforms of basic waveforms, the use of the Hanning filter for leakage reduction, Fourier analysis of the human voice, digital filtering of music. Fourier deconvolution. Lecture topics include principles explored in the laboratory exercises constructing basic interfacing circuits and laboratory exercises constructing basic interfacing circuits. (SP) Denazzo

192. Mechatronic Design Laboratory. (4)
One and one-half hours of lecture and ten hours of laboratory per week. Prerequisites: 120, Computer Science 61B or 61C, 150 or equivalent. Design project course, focusing on application of theoretical principles in electrical engineering to control of a small-scale, system, and mechatronic design and construction of a mechatronic system incorporating sensors, actuators, and intelligence. (SP) Feature

199. Supervised Independent Study. (1-4)
Course may be repeated for a maximum of four units per semester. Must be taken on a pass/not pass basis. Prerequisites: Consent of instructor and major adviser. Supervised independent study. Enrollment restrictions apply. (F,SP) Staff

Graduate Courses

C201. Strategic Computing and Communications Technology. (3)
Three hours of lecture per week. Prerequisites: Graduating standing in engineering, business administration, information management and systems, or consent of instructor. Factors strongly impacting the success of new computing and communications products and services (based on underlying technologies such as electronics and software) in commercial applications. Technology trends and limits, economics, standardization, intellectual property, government policy, and industrial organization. Strategies to manage the design and marketing of successful products and systems. Also listed as Information Systems C224 and Business Administration C290D. (SP) Messerschmitt, Varian

210. Applied Electromagnetic Theory. (3)
Three hours of lecture per week. Prerequisites: 117, or Physics 110A, 110B. Formerly 210A-210B. Advanced treatment of electromagnetic theory with engineering applications. Boundary value problems in electrostatics. Applications of Maxwell’s Equations to the study of waveguides, resonant cavities, optical fiber guides. Gaussian optics, diffraction, scattering, and antennas. (F) Welch

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 E2 Engineering 290C. 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 atomic model. 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 spatial and temporal coherence will be discussed. Also listed as Applied Science and Technology C210. (SP) Attwood

215. Power Systems. (3)

216. Antennas and Propagation. (3)
Three hours of lecture per week. Prerequisites: 210 or consent of instructor. Application of Maxwell’s Equations to the study of antennas and propagation of electromagnetic waves. Basic concepts of antennas as devices in communications systems. Analysis of wire antennas, arrays of elements, horns, reflector and lens systems, frequency independent antennas. The propagation of waves over the earth and in inhomogeneous and random media. Offered alternate years. (SP) Staff

219A. Computer-Aided Verification of Electronic Circuits and Systems. (3)
Three hours of lecture per week. Prerequisites: Consent of instructor; a course in linear algebra and ordinary differential equations useful. Formerly 219. This course describes the computer algorithms, techniques, and theory used in the simulation of electrical circuits and systems. This course is concerned with algorithmic techniques for the verification of the correctness of complex electronic circuits and systems that are implemented using detailed simulation of integrated circuits at the transistor level in the time and frequency domain, discrete-event and symbolic simulation, cycle-based simulation, RTL and behavioral simulation, equivalence checking, timing analysis, power estimation. (F) Sangiovanni-Vincentelli

219B. Logic Synthesis for Hardware Systems. (4)
Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. The course is concerned with the efficient representation and manipulation of logical functions in the computer and how this is implemented in the analysis and synthesis both the combinational and sequential logic. Brayton

219C. Computer-Aided Verification. (3)
Three hours of lecture per week. Prerequisites: 219B and Computer Science 172 or consent of instructor. Introduction to the theory and practice of formal methods for the design and analysis of electronic circuits and systems. Focus on algorithmic techniques for checking logical and timing properties of circuits and communication protocols. Topics include the semantics of reactive systems, temporal logic, equality checking, the theory of omega automata, state space reduction techniques, compositional and hierarchical reasoning, real time. Offered alternate years. (F,SP) Henzinger

220. Nonlinear Circuits. (3)
Three hours of lecture per week. Prerequisites: 104. Algebraic and dynamic n-potential and stability theory. Frequency-power formulas. Qualitative properties: equilibrium states, stability, oscillations, subharmonic, almost-periodic, and chaotic phenomena. Large signal frequency response. Harmonic balance, describing function and bifurcation. Applications to oscillators, multivibrators, mixers, modulators and harmonic generators. Offered alternate years. (SP) Chua

221A. Linear System Theory. (4)
Three hours of lecture and two hours of recitation per week. Prerequisites: 120. Mathematics 112 recommended. Basic system concepts; state-space and I/O representation. Properties of linear systems. Controllability, observability, minimality, state and output-feedback. Stability. Observers. Characteristic polynomial. Nyquist test. (F,SP) Staff

221B. Multivariable Feedback Systems. (3)
Three hours of lecture per week. Prerequisites: 221A or equivalent and one undergraduate control course. MIMO feedback systems design and analysis. Decentralization, tracking, disturbance rejection. Two degrees of freedom design. Robustness. Large scale interconnected systems. Linear Quadratic Optimal Control. (SP) Sastry

222. Nonlinear Systems—Analysis, Stability and Control. (3)
Three hours of lecture per week. Prerequisites: 221A or equivalent and one undergraduate control course. MIMO feedback systems design and analysis. Decentralization, tracking, disturbance rejection. Two degrees of freedom design. Robustness. Large scale interconnected systems. Linear Quadratic Optimal Control. (SP) Sastry

223. Stochastic Systems: Estimation and Control. (3)
Three hours of lecture per week. Prerequisites: 224 or equivalent. Stochastic processes and their description function method, linearization. Stability - direct and indirect methods of Lyapunov. Applications to the Lure problem - Popov, circle criterion. Input-Output stability. Additional topics include: estimation theory of complex systems, introduction to the “geometric” theory of control for nonlinear systems, passivity concepts and dissipative dynamical systems. (SP) Sastry

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R&Q requirement
AG suffix=course satisfies American culture requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
Modulation techniques, including PAM, QAM, PSK, FSK, and spread spectrum. Optimal demodulation techniques and their performance. Information-theoretic considerations and channel capacity bounds. Block, convolutional and trellis coding techniques. Intersymbol interference and equalization techniques. (SP) Kahn

225A. Digital Signal Processing. (3) Three hours of lecture per week. Prerequisites: 123 and 126 or solid background in Fourier transforms. Advanced techniques in signal processing. Stochastic signal processing, parametric statistical signal models, and adaptive filtering. Application to spectral estimation, speech and audio signal processing, equalization, channel cancellation, and linear prediction. (SP) Lee

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, Z transform, different equations, recursive computability, 2-D DFT and FFT, 2-D FIR filter design; human eye, perception, psychophysical vision properties, photometry and colorimetry, optics and image systems; image enhancement, image restoration, geometrical image modification, morphological image processing, halftoning, edge detection, image compression, error-correcting codes, arithmetic coding, Huffman coding, arithmetic coding dictionary techniques, waveform and transform coding DCT, KLT, Hadamard, multiresolution coding pyramid, subband coding. Fractal coding, vector quantization, motion estimation and compensation, standards: JPEG, MPEG, H.3xx, pre- and post-processing, scalable image and video coding, image and video transmission over noisy channels. (FSP) 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 consent of instructor. Introduction to relevant signal processing and basics of pattern recognition. Introduction to coding, synthesis, and recognition. Models of speech and music production and perception. Speech processing for speech analysis, reconstruction, and synthesis. Psychological aspects of applications with speech to speech and music. Vocoders and music synthesizers. Statistical speech recognition, including introduction to Hidden Markov Model and Neural Network approaches. (SP) Broderson, Morgan


226B. Applications of Stochastic Process Theory. (2) Course may be repeated for credit. Prerequisites: 226A. Advanced topics such as: Martingale theory, stochastic integrals, queueing networks, stochastic control. (SP) Anantharam, Varaiya

227A. Introduction to Convex Optimization. (3) Three hours of lecture per week. Convex optimization is a class of nonlinear optimization problems where the objective and the constraint functions are convex. Contrarily to the more classical linear programming framework, 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 address non-convex problems (such as "combinatorial optimization problems") using convex approximations that are more efficient than classical linear ones. The 3-unit course covers some convex optimization theory and algorithms. Projects involve developing algorithms for engineering design, modeling and estimation, finance, and operations research. (F) El-Ghaoui

227B. Convex Optimization and Approximation. (3) Three hours of lecture per week. Prerequisites: 227A or consent of instructor. This class and 227A form 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 arising with unknown but bounded data), of optimal control problems. Quality estimates of the resulting approximation. Applications in robust engineering design, statistics, control, finance, data mining, operations research. (F) El-Ghaoui

228A. High Speed Communications Networks. (3) Three hours of lecture per week. Prerequisites: 122, 229A (may be taken concurrently). Descriptions, models, and approaches to the design and management of networks. Optical transmission and switching techniques are described and analyzed using deterministic, stochastic, and simulation models. FDDI, DQDB, SMD5, Frame Relay, ATM, networks, and SONET. Applications demanding high-speed communication. (F) Varaiya, Walrand

228B. Communication Networks. (2) Two hours of lecture per week. Prerequisites: 122 and 226A, or equivalent. Formerly 228. Principles of design and analysis of communications networks. Circuit, packet, and hybrid switching networks, including setup, routing, flow control error recovery. MM1 and M/G1 queueing theory and its application to analysis of networks, including delay and blocking. (SP) Varaiya, Walrand

229. Information Theory and Coding. (3) Three hours of lecture per week. Prerequisites: 226 recommended. Statistics 200A or equivalent. Formerly EECS 229B. Fundamental bounds of Shannon theory and their application. Source coding theorem, Galois field theory, algebraic error-correction codes. Private and public-key cryptographic systems. Offered alternate years. (SP) Anantharam


231. Solid State Devices. (4) 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 devices including the development of new device physics, device characteristics, parasitic effects static and dynamic digital circuits for logic and memory functions. Calculations of speed and power consumption from layout and fabrication parameters. ROM, RAM, EEPROM circuits. Use of SPICE and other computer aids. (SP) Rabaey

240. Advanced Analog Integrated Circuits. (3) Three hours of lecture per week. Prerequisites: 140. Analysis and optimization design of monolithic operational amplifiers and wide-band amplifiers; methods of achieving wide-band amplification, gain-bandwidth considerations; analysis of noise in integrated circuits and low noise precision passive elements, analog switches, amplifiers and comparators, voltage reference in NMOS and CMOS circuits, Serial, successive-approximation, and parallel analog-to-digital converters. Switched-capacitor and CCI3 filters. Applications to codes, modern. (F,SP) Gray, Boser

242. Advanced Integrated Circuits. (3) Three hours of lecture per week. Prerequisites: 142. Analysis, design, and implementation of microwave amplifiers and mixers; the design of microwave oscillators, harmonic mixers, and frequency multipliers. (SP) Meyer

243. Advanced IC Processing and Layout. (3) Three hours of lecture per week. Prerequisites: 143 and 144 or 140 and 141. The key processes for the fabrication of integrated circuits. Optical, X-ray, and e-beam lithography, ion implantation, oxidation and diffusion, thin film deposition, ion and laser etching and ion milling. Effect of phase and density on performance. (SP) Staff

254. Fundamental Concepts of Information Theory. (2) Two hours of lecture per week. Prerequisites: EECS 140 or equivalent. Introduction to information theory, Shannon's entropy, channel capacity. Block, FSK, and spread spectrum. Optimal demodulation techniques, vector quantization, motion estimation and compensation, standards: JPEG, MPEG, H.3xx, pre- and post-processing, scalable image and video coding, image and video transmission over noisy channels. (FSP) Zakhor
Computer-Aided Design of Integrated Circuits. (3) Three hours of lecture per week. Prerequisites: 140 or 141. This course will cover a wide variety of topics relating to the development of computer aids for integrated circuit design. The course will emphasize state-of-the-art techniques and both the theoretical basis for the methods as well as the application of results to practical problems, including developments in computer-aided design. Topics to be covered include simulation, layout techniques, synthesis, verification, testing, and integrated design systems. (F) Newton, Sangiovanni-Vincentelli

Introduction to MEMS Design. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Advanced application of linear and non-linear systems techniques to the modeling and analysis of MEMS. Course may be repeated for credit. Three hours of lecture per week. Formerly 291E. This course will cover the fundamental concepts and design methodologies related to MEMS. (F,SP) Staff

Introduction to MEMS. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Advanced application of linear and non-linear systems techniques to the modeling and analysis of MEMS. Course may be repeated for credit. Three hours of lecture per week. Formerly 291E. This course will cover the fundamental concepts and design methodologies related to MEMS. (F,SP) Staff

Computer-Aided Design of Integrated Circuits. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Advanced application of linear and non-linear systems techniques to the modeling and analysis of MEMS. Course may be repeated for credit. Three hours of lecture per week. Formerly 291E. This course will cover the fundamental concepts and design methodologies related to MEMS. (F,SP) Staff

Analysis and Design of VLSI Analog-Digital Interface Integrated Circuits. (3) Three hours of lecture per week. Prerequisites: 240. Architectural and circuit level design and analysis of integrated analog-to-digital and digital-to-analog interfaces in CMOS and BiCMOS VLSI technology. Analog-to-digital converters, digital-to-analog converters, sample/hold amplifiers, continuous and switched-capacitor filters, RF integrators, electronics including synthesizers, LNAs, and baseband processing. Low power mixed signal design. Data communications functions including clock recovery. CAD tools for analog design including simulation and synthesis. (F) Sangiovanni-Vincentelli

Advanced Topics in Embedded Systems: Models, Validation, and Synthesis. (4) Four hours of lecture per week. Prerequisites: Background in logic synthesis and simulation or consent of instructor. This course deals with the design of embedded real-time systems. Topics include finite state machines, synchronous languages, large data flow networks, petri nets, software optimization and performance estimation, operating systems and scheduling, system level simulation, and interface-based design. (F,SP) Staff

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. (1-3)

Advanced Topics in Computer-Aided Design. (1-3)

Advanced Topics in Solid State Devices. (1-3)

Advanced Topics in Circuit Design. (1-3)

Advanced Topics in Semiconductor Technology. (1-3)

Advanced Topics in Electromagnetics and Plasma. (1-3)

Advanced Topics in Photonics. (1-3)

Advanced Topics in Mems, Microsensors, and Microactuators. (1-3)

Advanced Topics in Semiconductor Manufacturing. (1-3)

Advanced Topics in System Theory. (1-3)

Advanced Topics in Control. (1-3)

Advanced Topics in Bioelectronics. (1-3)

Advanced Topics in Communication Networks. (1-3)
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 equivalent to that gained in 3 or 77N. 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 aimed as prerequisite for 9C and 9F. (F,SP) Clancy

9C. C for Programmers. (1) Refer to computer science service course restrictions. Self-paced. Must be taken on a passed/not passed basis. Prerequisites: Programming experience with pointers (or addresses in assembly language) and linked data structures equivalent to that gained in 9B, 61A, or Engineering 77N. Self-paced course in the C programming language for students who already know how to program. Computation, input and output, control structures, arrays, strings, files, pointers, linked structures, use of dynamic storage, and implementation of abstract data types. (F,SP) Clancy

9D. Scheme and Functional Programming 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 Engineering 77N. Self-paced course in functional programming, using the Scheme programming language, for students who already know how to program, higher-order functions; list processing; implementation of rule-based querying. (F,SP) Clancy

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: 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 computer memory; control structures; classes; objects; transformational and functional programming;رينگر compounds; inheritance; GUI elements; applications; arrays, strings, files, and linked structures; exceptions; threads. (F,SP) Clancy

9F. C++ for Programmers. (1) Refer to computer science service course restrictions in the General Catalog. Must be taken on a passed/not passed basis. Prerequisites: Programming experience equivalent to that gained in 9B, 61A, or Engineering 77N. Self-paced introduction to the C++ programming language for procedural and object-oriented programming, aimed at students who already know how to program. (F,SP) Clancy

9G. JAVA for Programmers. (1) One hour of self-paced per week. Must be taken on a passed/not passed basis. Prerequisites: 9C, 9F or 61A or 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 computer memory; control structures; classes; objects; inheritance; GUI elements; applications; arrays, strings, files, and linked structures; exceptions; threads. (F,SP) Clancy

39. Freshman/Sophomore Seminar, (2-4) 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. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore division students have 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 are open to students interested in the topic and from semester to semester. Enrollment limits are set by the faculty, but the suggested limit is 25. (F,SP) Clancy

61A. The Structure and Interpretation of Computer Programs. (4) Three hours of lecture, three hours of discussion, and two and one-half hours of self-paced programming laboratory per week. 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. This course exposes students to techniques of abstraction at several levels: (a) within a programming language, using higher-order functions, manifest types, data-directed programming, and message-passing; (b) between programs and programming languages, using functional and rule-based languages as examples. It also relates these techniques to the practical problems of implementation of languages and algorithms on von Neumann machines. There are several significant programming projects, programmed in a dialect of the LISP language. (F,SP) Clancy, Harvey

61B. Data Structures. (4) Three hours of lecture, one hour of discussion, two hours of programming laboratory, and an average of six hours of self-directed programming per week. Prerequisites: A grade of B- or better in 61A or Engineering 77N. Fundamental data structures, including linear lists, queues, trees, and other linked structures; arrays strings, stacks, and hash tables. Storage management, elementary principles of software engineering. Abstract data types. Algorithms for sorting and searching. Introduction to implementation and program language. (F,SP) Clancy, Hillig, Yelick

61C. Machine Structures. (3) Two hours of lecture, one hour of discussion, and an average of six hours of self-directed programming laboratory per week. Prerequisites: 61B. The internal organization and operation of digital computers. Machine architecture, support for high-level languages (logic, arithmetic, instruction sequencing) and operating systems (I/O, interrupts, management, process switching). Elements of computer organization in fundamental architectural design decisions. (F,SP) Staff

70. Discrete Mathematics and Probability Theory. (4) Students will receive no credit for 70 after taking Mathematics 55. Three hours of lecture per week, or three hours of lecture and two hours of discussion per week. Prerequisites: Sophomore mathematical maturity, and programming experience equivalent to that gained in 3 or the Advanced Computer Science A course. Logic, infinity, and induction; applications include undecidability and stable marriage problems. Modular arithmetic and GCDs; applications include primality testing and cryptography. Polynomials; error-correcting codes and interpolation. Probability including sample spaces, independence, random variables, law of large numbers; examples include load balancing, existence arguments. Bayesian inference. Demmel, Papadimitriou, Russell, Sinclair

98. Directed Group Study, (1-4) Course may be repeated for credit. One hour of lecture per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. For group study of selected topics, which will vary from year to year. Intended for students in the lower division. (F,SP) Staff

99. Individual Study and Research for Undergraduates. (1-2) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: GPA of 3.4 or better. May be repeated for credit. One hour of lecture per week per unit. Must be taken on a passed/not passed basis. Prerequisites: 150. Students will receive no credit for 99 after taking 161A and 161B and 161C or 170 after taking 170. Students will work in teams on a substantial programming project. (F,SP) Brewer, Hillig, Rowe

152. Computer Architecture and Engineering. (5) Three hours of lecture and two hours of discussion per week and one large design project. Prerequisites: 150. Instruction set design. Register Transfer. 5 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) Cutler, Kubiatowicz, Wawrynek

160. User Interface Design and Development. (4) Three hours of lecture, 1 hour of discussion, and four hours of self-directed programming laboratory per week. Prerequisites: 61B. The design, implementation, and refinement of human-computer interfaces. Applications include interface devices (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 methodologies, implementation tools, testing, and quality assessment. Students will develop a direct-manipulation interface. Landay, Rowe

162. Operating Systems and System Programming. (4) Three hours of lecture, one hour of discussion, and four hours of programming laboratory per week. Prerequisites: 61B, 61C, and Math 55. Basic concepts of operating systems and system programming. The design and implementation of multiple operating systems. Processes, interprocess communication, and synchronization. Memory allocation, segmentation, paging, and linking. Scheduling, process management, priority-based scheduling. Implementation tools, testing, and quality assessment. Overview of run-time organization and error handling. (F,SP) Aiken, Hillig, Rowe

169. Software Engineering. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 61B and 61C, Math 55 or 113. Ideas and techniques for designing, developing, and modifying large software systems. Function-oriented and object-oriented modular design techniques, designing for re-use and maintainability. Specification and documentation. Verification and validation. Cost and quality metrics and estimation. Project team organization and management. Students will work in teams on a substantial programming project. (F,SP) Sinclair, Papadimitriou, Vazirani


174. Combinatorics and Discrete Probability. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 170. Permutations, combinations, principle of inclusion and exclusion, generating functions, Ramsey theory. Expectation and variance, Chebyshev’s inequality, Chernow bounds. Birthday
C182. The Neural Basis of Thought and Language. (4) Three hours of lecture and one hour of discussion per week. This is a course in the current status of inter-disciplinary studies that seeks to answer the following questions: Is it possible for the human brain, which is a highly structured network of neurons, to think and 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 the 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 Undergrad Interdisciplinary Studies C130, Linguistics C109, and Cognitive Science C110. Feldman, G. Lакот


186. Introduction to Database Systems. (4) Three hours of lecture and one hour of discussion per week, Prerequisites: 61B and 61C. Access methods and file system fundamentals. Hierarchical, network, relational, and object-oriented data models. Query languages for models. Embedding query languages in programming languages. Database services including protection, integrity control, and alternative views of data. High-level interfaces including application generators, browsers, and report writers. Introduction to transaction processing. Database system implementation to be done as term project. (FSP) Hellerman

188. Introduction to Artificial Intelligence. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 61A or 61B and consent of instructor. Basic ideas and techniques underlying the design of intelligent computer systems. Topics include heuristic search, problem solving, game playing, knowledge representation, logical inference, planning, reasoning under uncertainty, expert systems, learning, perception, language understanding. (FSP) Malik, Russell, Wilensky

195. Social Implications of Computer Technology. (2) Two hours of lecture per week. Prerequisites: Must be taken on a passed/not passed basis. Prerequisites: Major in EECS or CS or consent of instructor. Topics include electronic community; the changing nature of work; the information economy; intellectual property; privacy; artificial intelligence and the sense of self; pornography and censorship; professional ethics. Students will lead discussions on some of these topics. (SP) Harvey

H196. Honors Seminar for Computer Science Majors. (3) Three hours of lecture per week and project work. Must be taken on a passed/not passed basis. Prerequisites: 150, 170, and consent of instructor. Study in-depth of several topics in computer science to be chosen by the instructor. Students will assess current literature in the topics and present critiques to the class. Each student will carry out a project. (SP) Staff

198. Directed Group Studies for Advanced Undergraduates. (1-4) Course may be repeated for credit. Course format varies with section. Must be taken on a passed/not passed basis. Prerequisites: 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) Course may be repeated for a maximum of four units per semester, subject to approval of the instructor. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and major adviser. Supervised independent study. Enrollment restrictions apply. (FSP) Staff

Graduate Courses

250. VLSI Systems Design. (4) Three hours of lecture and four hours design lecture per week. Prerequisites: 150. Unified top-down and bottom-up design of integrated circuits and systems forecasting on architectural and topological issues. VLSI architectures, systolic arrays, self-timed systems. Trends in VLSI design and implementation. Physical tradeoffs in custom-design, standard cells, gate arrays. VLSI design tools. (F) Wawrzynek

252. Graduate Computer Architecture. (4) Three hours of lecture and one hour of discussion per week, Prerequisites: One of contemporary computer organizations covering: early systems, CPU design, instruction sets, control, processors, busses, ALU, memory, I/O interfaces, connection networks, virtual memory, multiprocessor design, and case studies. Prerequisites of term paper or project is required. (FSP) Culler, Kubiatowicz, Patterson

254. Topics in VLSI Chip Design and Implementation. (4) Course may be repeated for credit. Three hours of lecture and three hours of design lecture per week. Prerequisites: 250, 253, and 254. Comprehensive implementation and testing of LSI/VLSI multi-project technology. Apply the design techniques learned in CS 250 to build systems on silicon chips. Design for testability, preparation of system level schematic testing of the fabricated chips. Wawrzynek

258. Parallel Processors. (3) Three hours of lecture per week. Prerequisites: 252. In-depth study of the design, engineering, and evaluation of modern parallel computers. Fundamental design: naming, synchroniza- tion, latency, and bandwidth. Architectural evolu- tion and technological driving forces. Parallel pro- gramming models, communication primitives, programming and compilation techniques, multipro- gramming and multiprocessors, parallel operating systems. Optimizing parallel computer performance evaluation. Latency avoidance through replication in small-scale and large-scale shared memory designs; cache-coherence, protocols, directories, and memory consistency. Protocols; 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 de- sign: topology, packaging, k-sny k-cubes, performance under contention. Synchronization: global operations, mutual exclusion and associative 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-in- terfaces to computer systems. Software and hardware architectures for personal computers. Object-oriented programming systems. Form-based user-interfaces. Window and display management abstractions. Case studies of naive- and expert-user interfaces. Study of user interfaces will complete a substantial project. Landay, Rowe

261. Security in Computer Systems. (3) Three hours of lecture per week. Prerequisites: 162. Graduate survey of modern topics in computer security, including protection, access control, distributed access security, authentication, encryption, firewalls, secure coding practices, safe languages, mobile code, and case studies from real-world systems. May also cover cryptographic protocols, pri- vacy and anonymity, and or other topics as time per- mits. (SP) Brewer

262A. Advanced Topics in Computer Systems. (4) Three hours of lecture per week. Prerequisites: 162 and entrance exam. Formerly 262. Graduate survey of systems for managing computation, covering a breadth of topics: early systems; volatile memory management, including virtual memory and buffer management; persistent memory systems, including both file systems and traditional storage managers; storage metadata, physical vs. logical naming, schemas, process scheduling, threading and con- current control; system support for networking, in- cluding remote procedure calls, transactional RPC, TCP, and active messages; security infrastructure; ex- tensible systems and APIs; performance analysis and engineering of large software systems. Homework assi- gnments, exam, and term paper or project required. (FSP) Hellerstein

263. Design of Programming Languages. (3) Three hours of lecture and one hour of discussion 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 proof of correctness. Also listed as Undergrad Interc-disciplinary Studies C130, Linguistics C109, and Cognitive Science C110. Feldman, G. Lакот


289. Advanced Topics in Distributed Computing Systems. (2) Two hours of lecture per week. Prerequisites: 162, 262 recommended. Formerly 292DJ. Building distributed computer systems, issues and techniques; communication; distributed data, identification of resources and their distributed management,
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, augmenting algorithms; branch-and-bound algorithms; data structure techniques for efficient implementation of combinatorial algorithms; analysis of data structures; applications of data structure techniques to combinatorial and geometric problems. Papadimitriou, Sinclair, Vazirani

271. Randomness and Computation. (3) Three hours of lecture per week. Prerequisites: 170 and at least one course numbered 270-279. Computational applications of probability and computational randomness of approximate counting and uniform generation of combinatorial objects, rapid convergence of random walk on expanders graphs, randomized reductions, Kolmogorov complexity, pseudo-random number generation, semi-random sources. Sinclair


274. Computational Geometry. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 170 or equivalent. Formerly 292T. Constructive problems in computational geometry: convex hulls, triangulations, Voronoi diagrams, arrangements of hyperplanes, searching among these problems. Search problems: advanced data structures; subdivision search; various kinds of range searches. Models of computation; lower bounds. Staff

276. Number Theory and Cryptography. (2) Two hours of lecture per week. Prerequisites: 170 and either Mathematics 113A or 115A. Computing the greatest common divisor; efficient exponentiation mod n; efficient algorithms (some probabilistic, some deterministic/extended Riemann hypothesis) to decide primality and extract square roots modulo a prime; not so efficient factoring; applications of number theory to cryptography, generation of pseudo-random sequences, design of protocols. Blum

277. Concrete Complexity. (3) Three hours of lecture per week. Prerequisites: 100 and Mathematics 113A. The study of inherent complexity of specific computational problems. Circuit complexity, branching programs, decision tree models, sorting and selection, eavesdropping, circuit complexity, communication complexity, VLSI complexity, time/space trade-offs. Staff

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. Vazirani

279. System Support for Scientific Computation. (3) Three hours of lecture per week. Prerequisites: 68B, Engineering 118 or Mathematics 128. Formerly 281. Trace the consequences of design decisions made by "architects" of hardware, languages and operating systems upon those who use the computer for large-scale numerical computations in business, engineering, and science. Staff


C281B. Advanced Topics in Learning and Decision Making. (3) Three hours of lecture per week. Prerequisites: C281A, Statistics C241A. Recent topics include: Graphical models and approximate inference algorithms. Markov chain Monte Carlo, mean field and probability propagation methods. Model selection and stochastic realization. Bayesian information theoretic and structural risk minimization approaches. Markov decision processes and the value function Markov decision processes. Reinforcement learning. Also listed as Statistics C241B. (SP) Jordan, Russell

282. Algebraic Algorithms. (3) Three hours of lecture per week. Prerequisites: 164, Mathematics 113B, or permission of instructor. Theory and construction of symbolic computer programs. Polynomial arithmetic, GCD, factorization, integration of elementary functions, analytic approximation, simplification, design of computer systems and languages for symbolic manipulation. Fateman

283. Programming Technology for Artificial Intel- ligence and Symbolic Manipulation. (3) Three hours of lecture per week. Prerequisites: 164, Advanced LISP programming. AI programming languages, in-dexing, discrimination nets, unification pattern matching, production systems, predicate-calculus based systems, frame-based systems, representations for mathematical forms, symbolic and algebraic manipu- lation techniques. Fateman


285. Solid Free-Form Modeling and Fabrication. (3) Three hours of lecture per week. Prerequisites: 164. From shape design to computer-based descriptions suitable for manufacturing or rapid prototyping. Solid modeling techniques and procedural shape generation. Effective data structures and unambiguous part de- sign. Brep formats. Algorithms for dealing with Boolean operations and for machine tool path planning. Prob- lems of finite-precision geometry and machining toler- ences. Introduction to some rapid prototyping tech- niques based on Solid Free-Form Fabrication and Maching. Other advanced topics and recent develop- ments 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 systems. Considerations concern- ing operating system design, including buffering, page size, prefetching, etc. Query processing algorithms, de- sign of crash recovery and concurrency control sys- tems. Implementation of distributed data bases and data base machines. Hellerman


288. Artificial Intelligence Approach to Natural Lan- guage Processing. (3) Three hours of lecture per week plus programming assignment. Prerequisites: 164. Representation of common sense knowledge; language analysis and production, models of inference and memory, high-level text structures, question an- swering and conversation, machine translation. Wilensky


294. Special Topics. (1-4) Course may be repeated for credit. Topics will vary from semester to semester. See Computer Science Division announcements. (F,SP) Staff

298. Group Studies Seminars, or Group Research. (1-4) Course may be repeated for credit. One to four hours per unit. Sections 1-25 to be graded on a satisfac- tory/unsatisfactory basis. Sections 26-35 to be graded on a letter-grade basis. Advanced study in vari- ous subjects through seminars on topics selected by students. Individual group studies of special problems, group participation in comprehensive design projects, 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 investigations of problems in computer science. (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, consultation with faculty member. Must be taken on a satisfactory/unsatisfactory basis. Individual study under the direction of a major field advisor, intended to provide an opportunity for qualified students to prepare themselves for the vari- ous examinations required of candidates for the Ph.D. (and other doctoral degrees). (F,SP) Staff

Professional Courses

300. Teaching Practice. (1-6) Course may be re- peated for credit. Three to twenty hours of discussion and consulting per week. Must be taken on a satis- faction/unsatisfactory basis. Supervised teaching prac- tice, in either a one-on-one tutorial or classroom dis- cussion setting. (F,SP) Staff

301. Teaching Techniques for Computer Science. (1-3) Course may be repeated for credit. One hour of discussion per week. Must be taken on a satisfac- tory/unsatisfactory basis. Prerequisites: Consent of in- structor. Discussion and practice of techniques for ef- fective teaching. (F,SP) Clancy

302. Designing Computer Science Education. (2) Two hours of lecture per week. Prerequisites: Computer Science 301 or two semesters of GSI experience. Discussion, practice, and review of research concerning issues relevant to the teaching of computer science curriculum and topic organization, presenta- tion, technology, grading, staff management. (SP) Clancy
Endocrinology
(College of Letters and Science)

Group Office: 3060 Valley Life Sciences Building, (510) 642-6264
Co-Chairs: Gary L. Firestone, Ph.D. and Tyrone B. Hayes, Ph.D.

Professor
James P. Allison, Ph.D.
Marc Breedlove, Ph.D.
Roy L. Carlson, Ph.D.
Marian C. Diamond, Ph.D.
Gary Firestone, Ph.D.
Stephen E. Glinski, Ph.D.
Paul J. Hossley, Ph.D.
Hsiao-Ping Moore, Ph.D.
Satyabrata Nardi, Ph.D.
Charles Persky, Ph.D.
Hee Sook Sul, Ph.D.
Irving J. Tannenbaum, Ph.D.
Howard A. Bern, Ph.D. (Emeritus)
James W. Frohman, Ph.D. (Emeritus)
Paola S. Timiras, M.D., Ph.D. (Emeritus)

Associate Professors
Gregory Aponte, Ph.D.
Gary E. Buehling, Ph.D.
Tyrone B. Hayes, Ph.D.

The Graduate Program

The faculty associated with the program leading to the M.A. and the Ph.D. in endocrinology have di-
verse interests representing endocrinology in the broadest sense: chemical mediators in the living
world (autocrine, paracrine, endocrine and ecco-
 hormonal factors), with approaches from molecu-
lar and cellular endocrinology through organizational
and comparative endocrinology to chemical eco-
yology.

Students who plan to work for higher degrees in
endocrinology at Berkeley will be guided by a grad-
uate adviser and by the professor who directs their
research. The graduate adviser and the major pro-
fessor will ascertain whether students have met the
minimum requirements, will recommend to prospec-
tive candidates what additional courses to take,
and will decide with them the fields to be covered
in the qualifying examinations, and will act gener-
ally in an advisory capacity. The candidates are ex-
pected to have completed an undergraduate major
in any area of animal biology leading to the B.A. or B.S. degree.

To advance to candidacy for the Ph.D., students
must complete all requirements (information can be
obtained from the graduate advisers or at the office
given above), including passage of an oral qual-
ifying examination.

Energy and Resources Group
(Special Studies)

Department Office: 310 Barrows Hall, (510) 642-1664
http://erg.berkeley.edu
Chair: Thomas M. (Zack) Powell, Ph.D.

Professor
Gary Brewer, Ph.D. Yale University. Environmental issues, water, climate, water
Catherine Koshland, Ph.D. Stanford University. Energy, society, development, environment
Gene L. Roehl, Ph.D. University of Chicago. Energy, security, political economy

Associate Professor
Daniel Karmen, Ph.D. Harvard University. Energy, society, development, environment

Professor
Edward Arens, Ph.D. (Architecture)
David Caron, Ph.D. (Chemical Engineering)
Charles Birdsall, Ph.D. (Elastic Engineering)
Eisen Cairns, Ph.D. (Chemical Engineering)
David Caron, J.D. (Law)

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
H prefix=honors course

Program Overview

The Energy and Resources Group (ERG) is an inter-
disciplinary academic unit that conducts gradu-
atute teaching and research. It treats issues of
energy, resources, development, human and bi-
lological diversity, and international security at the
intersection of technological, environmental, eco-

mical, and sociopolitical dimensions. Established
in 1973, ERG offers two-year M.A. and M.S. de-
grees in energy and resources, as well as the Ph.D.

Faculty. The faculty of ERG consists of six pro-
fessors of Energy and Resources plus some 100
other affiliated faculty members whose main ap-
pointments span all five colleges and four of the
schools of the Berkeley campus, as well as the
University’s Lawrence Berkeley and Lawrence Liv-

ermore national laboratories. The chair is normally
drawn on a rotating basis from the affiliated faculty.

Students. There are approximately 60 graduate
students enrolled in ERG degree programs, about
half of them doctoral candidates. The students come
from a wide variety of backgrounds—engi-
eering, natural sciences, social sciences, and hu-
manities. The characteristics they have in common
are an interest in interdisciplinary approaches to
energy and resource issues and the intellectual
credentials to survive a highly competitive admis-
sions process. All receiving training at ERG in the
technological, environmental, economic, and so-
ciopolitical dimensions of energy and resource is-

sues while pursuing additional course work and in-
dividual research tailored to their interest and back-
grounds.

Graduates. ERG graduates are employed across
the U.S. and around the world in universities, gov-

ernmental and international agencies, legislative
staff positions, national laboratories, public and pri-
vate utilities, other energy and resource compa-
nies, consulting firms, and public-interest organi-
zations.

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, sociopoliti-
cal and economic aspects. The courses provide
both basic surveys of the field and introductory
training in interdisciplinary research methods.

There are no prerequisites for enrollment in the
courses unless specifically noted otherwise in the
descriptions below.

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,
resources, politics, public policy, or environmental sciences.

Admission. Applications are considered once a year for fall semester admission only. Continuing students may be 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) 643-9540. Web site: http://socrates.berkeley.edu/erg/.

Upper Division 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, politics, economics, and environmental effects of energy in contemporary society. Energy and well-being; energy in international perspective, origins, and character of energy crisis. (F) Kammen, Norgaard

102. Quantitative Aspects of Global Environmental Problems. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Physics 7C; or Physics 8B and Math 1B or Math 2B and Chemistry 1A, or their equivalents. Environmental data analysis and hypothesis testing for environmental scientists, with emphasis on characterizing and evaluating uncertainty. Introduction to selected topics relevant to environmental analysis, including energy, water, design of experiments, and Monte Carlo methods. Also listed as Earth and Planetary Science C120.

C130. Analysis of Environmental Data. (3) Three hours of lecture per week. Prerequisites: One year of college mathematics and concurrent enrollment in 120L 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 energy, water, design of experiments, and Monte Carlo methods. Also listed as Earth and Planetary Science C120.

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) Rochlin

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. A topical seminar on the social, economic, and political aspects of energy supply and use, including regional, national, and international issues. Emphasizes systematic assessment of alternative strategies and options from an interdisciplinary viewpoint. (F) Kammen, Norgaard

C202. Modeling Ecological and Meteorological Phenomena. (3) Three hours of lecture per week. Prerequisites: 102 or consent of instructor. Modeling methods in ecology and meteorology; stability analysis; effects of anthropogenic stress on natural systems. Alternating years. Also listed as Environ Sci, Policy, and Management C211 and Integrative Biology C271. (SP) Powell

C210. Quantitative Methods for Ecological and Environmental Modeling. (3) Three hours of lecture per week. Prerequisites: Upper division statistics and agreement to proceed with the development of the model. This course will review the background mathematical and statistical tools necessary for students interested in pursuing ecological and environmental modeling. Topics include linear algebra; 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 Environ Sci, Policy, and Management C205 and Integrative Biology C210. (F) Staff

251. The Political Economy of Energy. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Some familiarity with present critical problems in energy policy and at least a broad general understanding of relevant technologies. The political economy of energy policy, emphasizing the appropriate and actual roles of governments, state and federal. Emphasis on how and why to apply various theoretical and methodological tools of the social sciences to policy making in technical issue areas. (SP) Rochlin

255. Large Socio-Technical Systems: Design, Organization, and Risk. (3) Three hours of lecture and one hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. This course focuses on the forces that shaped the development trajectories of the history, design, operation, and regulation of large-scale socio-technical systems such as electric utilities, air traffic control, or the NASA space program. The behavior and culture of operators and managers will be studied in search of the origins of organizational performance and reliability, and the source of errors, failures, or mistakes. Offered alternate years. (SP) Rochlin

261. Natural Resources and Regional Development. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Some background in social theory and political economy are strongly recommended. This graduate course is concerned with understanding how the presence of particular natural resources shaped the development trajectories, social class relations, and economic and political power structures of particular regions. The course will consider a variety of natural resources in a range of geographical and historical settings. Issues addressed include the “uniqueness” of natural resource industries; resource characteristics and industry organization; the labor process; natural resources and the state; and culture and commodity demand. Students will be introduced to the debates and issues in literature on natural resources and regional development, to empirically grounded case studies and to alternative methodological approaches to research in the field. Some background in social theory and political economy are recommended. (SP) Staff

265. Biotechnology, Biodiversity, and Agriculture. (3) Three hours of seminar per week. This graduate seminar explores the debates over genetic engineering through the lens of agriculture, the arena in which most biotechnology development is taking place. After reviewing theoretical perspectives on technology, the course will explore historical experiences with several antecedents such as agriculture; the political-economic context in which agricultural biotechnology is being developed; the role of universities and the state in biotechnology research; biotechnology and international inequality; issues related to intellectual property rights; and potential environmental consequences of the new biotechnologies. (F) Staff

280. Energy Economics. (3) Three hours of lecture per week. Prerequisites: Economics 100A or equivalent; basic calculus or linear algebra. Input-output and cost-benefit analysis applied to energy; exhaustion theory and economics of energy supply; patterns of energy use; trade-offs in energy conservation; the effect of energy policy on supply and demand; projecting future energy and resource supply and use. (SP) Norgaard

282. Resources, Ecology, and Development: The Social Science Response. (3) Three hours of lecture per week. Prerequisites: Graduate course. The social science response to resource depletion, ecological complexity, and the role of biological diversity. The implications of the growing acceptance of alternative paths of development and of alternative forms of knowledge to conventional social science. Western and non-Western, governmental and nongovernmental organizations. A review of the conceptual literature with case studies from the Third World. (F) Norgaard

290. Group Seminar. (1-3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Graduate standing in Energy and Resources Group. Graduate student presentations and faculty-student discussions of advanced topics in interdisciplinary energy research. A seminar on emerging energy and resources. Instructor determines class meetings and assignments; unit determined according to instructor and student time requirements by the Curriculum Committee. (F,SP) Staff

C291. Ecological and Social Dimensions of Global Change. (2) One and one-half hours of discussion and a non-student seminar presentation. Must be taken on a satisfactory/unsatisfactory basis. This seminar will explore the possible social and ecological impacts of global change, the economic, political, and tradeoffs associated with the following human responses to global change: adaptation, prevention, and no response. Emphasis is placed on developing predictive models of the human response (including humans) that will respond to global change. Also listed as Geography C244, Integrative Biology C272, and Environ Sci, Policy, and Management C212.

292A. Analytical Methods in Energy and Resources. (2) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of Instructor. Quantitative methods for energy and resource analysis. Topics include linear algebra, differential equations, statistical methods, chemical equilibrium theory, and thermodynamics. (F) Staff

292B. Interdisciplinary Problem Solving as a Profession. (2) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Open to ERG graduate students only. An introduction to a profession in interdisciplinary research, including such topics as organizing time and information, selecting and defining research topics, conducting research, writing skills, oral presentations, getting published, getting funded, finding employment. (F) Staff

292C-292D. Master’s Project Seminar. (2-2) Two hours of seminar per week. Credit and grade to be awarded on completion of sequence. Required of second-year Energy and Resources Master’s candidates. Topics include the adoption of a research project, research design, presentation of work, statistical analyses. Students will apply the interdisciplinary methods,
approaches, and perspectives learned in the core curriculum. Sequence begins fall each year. Credit and grade to be awarded upon completion of the full sequence. (F,SP) Staff

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 satisfactory/unsatisfactory basis. Presentations of research in energy issues by faculty, students, and visiting lecturers. Master’s degree students required to enroll for three semesters. (F,SP) Staff

296. Group Studies. (2) Course may be repeated for credit. Two hours of section per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. (F,SP) Staff

299. Individual Research in Energy and Resources. (1-8) 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. (1-8) 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 themselves for the various exams required of candidates for the Ph.D. (F) Staff

Professional Courses

301. Graduate Student Instructor Practicum. (3) Course may be repeated for credit. Course credit for experience gained in academic teaching through employment as a graduate student instructor. (F,SP) Staff

Undergraduate Programs

The college offers programs in a wide variety of engineering fields. These programs are based on the concept that an engineer must be well-grounded in the sciences, humanities, and social studies, with full command of the principles and practices of the engineering profession.

Four-year undergraduate programs are offered in the following professional fields: civil engineering, electrical and computer engineering, computer science and engineering, industrial engineering and operations research, mechanical engineering, and nuclear engineering. These programs, with the exception of computer science and engineering, are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), 111 Market Place, Suite 1050, Baltimore, MD 21202-4012. Telephone: (410) 347-7700. Computer science and engineering is accredited by the Computer Science Accreditation Commission of ABET. Programs are also offered in bioengineering, manufacturing engineering, and materials science. Each of the curricula is administered by a department within the college and each emphasizes a core program of science and engineering subjects related to the particular field. In addition, there is a curriculum in engineering science with programs in computational engineering science, engineering mathematics and statistics, engineering physics, and environmental engineering science. Entering freshmen may apply for admission to an engineering—undeclared option. The college offers five double major programs that combine engineering with either mechanical engineering or electrical engineering and computer science; and materials science and engineering combined with nuclear engineering. In addition to these five programs, double major programs in chemical engineering combined with materials science and engineering or nuclear engineering are offered jointly by the College of Chemistry and the College of Engineering.

Degree Requirements

Engineering students must fulfill University of California, Berkeley campus, and College of Engineering requirements to graduate. The unit requirement for the bachelor’s degree is normally 120 semester units, within which the student is expected to satisfy graduation requirements. This minimum may be exceeded for valid reasons. To exceed 125 units, prior approval of the dean is required for registration.

Admission Requirements

Entering freshmen should have completed the following subjects:

High School Subjects and Units:

- United States history—1 (one year of United States history or one-half year of United States history and one-half year of civics or American government.)
- English—4
- Mathematics—4
- Physics—1
- Chemistry—1
- Foreign language—2

Other college preparatory subjects—2

Total units—15

Graduate Programs

Graduate programs are offered leading to the Master of Science and Doctor of Philosophy degrees for study emphasizing engineering and applied sciences, and Master of Engineering and Doctor of Engineering degree programs emphasize advanced professional studies of design development. Fields of study include bioengineering, civil and environmental engineering, electrical engineering and computer sciences, industrial engineering and operations research, mechanical engineering, nuclear engineering, ceramic engineering and metallurgy, materials science and engineering, fluid mechanics, applied mechanics, and naval architecture and offshore engineering. Interdisciplinary graduate programs are also available in the fields of bioengineering, biophysics, ocean engineering, plasma, environmental engineering, applied science and technology, management of technology, robotics and manufacturing, fire safety engineering science, surface and subsurface hydrology, and rock mechanics.

Concurrent degree programs provide a broad, integrated curriculum between two disciplines. Degrees awarded are an M.Arch. in Architecture with an M.S. in Civil and Environmental Engineering (Structural); an M.C.P. in City and Regional Planning with an M.S. in Civil and Environmental Engineering (Transportation); and an M.F.P. in Public Policy with an M.S. in an engineering department.

More information will be found in the engineering sections of this catalog and in the Announcements of the College of Engineering. The announcement is available from the College of Engineering, University of California, Berkeley; 308 McLaughlin Hall #1702, Berkeley, CA 94720-1702, or from any organizational unit listed below.

Organizational Units

Bioengineering

Department Office: 459 Evans Hall #1762, (510) 642-5825
Chair: Thomas F. Budinger, M.D., Ph.D.

Civil and Environmental Engineering

Department Office: 760 Davis Hall #1710, (510) 642-3261
Chair: Adb Kananfani, Ph.D.

Electrical Engineering and Computer Sciences

Department Office: 231 Cory Hall #1770, (510) 642-3214
Chair: S. Shankar Sastry, Ph.D.
Associate Chair, Electrical Engineering: Jan M. Rabaey, Ph.D.

Computer Science Division

Division Office: 389 Soda Hall #1776, (510) 642-1024
Associate Chair: Christos Papadimitriou, Ph.D.

Industrial Engineering and Operations Research

Department Office: 4135 Etcheverry Hall #1777, (510) 642-5484
Chair: Candace A. Yano, Ph.D.
An introductory 50. Two hours of lecture and three hours of lab-
voted to relation between microstructure and the me-
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 Engi-
neering, and Laboratory. (1) May be repeated for credit. (1-3)
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 who are lower division engineering majors may be required to complete the lower division engineering course may complete the work un-
der this heading. (F,SP) Staff

63. Engineering Design Case Studies and Design Labo-
ratory. (3) Two hours of lecture and three hours of laboratory or design session per week. Prerequisites: Lower division standing in the College of Engineering or consent of instructor. The science and art of engi-
neering. Application of computers in engineering de-
sign and implementation of embedded microprocessors. Case studies of multidisciplinary mechatronics engi-
neering design. Design, construction and testing of a mechatronics prototype product. Practice in commu-
nication of technology information. (F,SP) Casey

66. Engineering Design Studio. (3) Five hours of laborato-
ry and one hour of lecture per week. Prereq-
usites: Freshman and sophomore standing in engi-
neering. Creative problem-solving and multidisciplinary engi-
neering design. Students work in teams of no more than three persons, plus a mentor, on a design project of their choosing. Aspects of the design process, com-
municating engineering ideas, scope of a project, tin-
kering as forerunner to engineering, using tools and equip-
ment of the prototyping or model shop and lab-
atory, selecting design materials, fabricating the pro-
totype, testing and modifying the prototype. No final ex-
amination. Sponsoring departments: Mechanical Engineering and Electrical Engineering and Computer
Sciences. (F,SP) Staff

76. Moving from Procedural to Object-Oriented
Programming. (1) One hour of lecture per week and five discussion/laboratory sessions per semester. Pre-
requisites: A one-semester course in procedural pro-
grammimg or consent of instructor. This is a "bridge course" designed for students with prior knowledge (equivalent to a semester-long course) of programming but in mostly procedural languages, as for example, FORTRAN, to modern object-oriented programming environments, with MATLAB being the present choice for the working
language. There are three principal components of the course: first, teach students MATLAB; second, in-
troduce students to fundamental concepts of object-orien-
ted programming, such as recursion, data struc-
tures, and classes; and third, to develop practical skills in application of the learned concepts and program-
ning skills to solve effectively problems encountered in engineering analysis, intelligent manufacturing, pro-
cess control, and other applications. (F) Packard

77N. Introduction to Computer Programming for
Scientists and Engineers. (3) Two hours of lecture, one hour of discussion, and four hours of laboratory per week. Prerequisites: Mathematics 1A (may be
taken concurrently). Formerly 77. Elements of pro-
cedural programming. Induction, iteration, and recur-
sion. Real functions and floating-point computations. Introduction to data structures. Representative ex-
amples are drawn from elementary algebra, calculus and geometry. The course uses the MATLAB pro-
grammaging language. Sponsoring department: Civil and Environmental Engineering. (F) Canny, Cassidy, Madanat, Papadopoulos, Rector

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 undeclared En-
geineering students, with information on the various engi-
neering disciplines to guide them toward choice of major. Lecturers describe research activities, how they
made their own career choices, and indicate future op-
opportunities. Recommended for all Engineering Sciences
majors and students required for Engineering Sciences unde-
clarated students. (F) Casey

45. Properties of Materials. (3) Three hours of lec-
ture per week and three hours of laboratory on alter-
nate weeks. Prerequisites: Physics 7A. Application of basic principles of physics and chemistry to the engi-
neering properties of materials. Special emphasis de-
oted to relation between microstructure and the me-

101. Fractals, Chaos, and Complexity Around Us. (3)
Two hours of lecture and one hour of discussion per week. Prerequisites: Upper division standing. Con-
cepts and applications of fractal geometry, nonlinear chaotic dynamics, and emerging complex systems. Emphasis on intuitive understanding of the concepts rather than rigorous formalism. Applications to various areas of science, engineering, and everyday life. Top-
ics include percolation and flow through fractures, ag-
gregation, self-scaling coastlines, fractal landscapes,
chaotic chemical reactions, and pattern formation. Sponsoring department: Civil and Environmental En-
gineering. (F) Hermanowicz

102. Introduction to Operations Research. (3) Two hours of lecture and one four-week project period. Prerequisites: Mathematics 1B. Not open to students ma-
joring in Industrial Engineering and Operations Re-
search. Introduction to the models and techniques of operations research as they pertain to engineering sys-
tems problems. Linear and dynamic programming.
Queues and inventory models. Examples will be drawn from various engineering disciplines to illustrate tech-
niques. Sponsoring Department: Industrial Engineering and Operations Research. (F)

C111. Introduction to Networked Applications
and Computing. (3) Three hours of lecture per week. Prere-
quises: Undergraduate in good standing, and ex-
perience with personal computing and Internet ap-
lications. Any student who can successfully use a personal computer to author documents, browse the World Wide Web, etc. can successfully complete this course. Introduction to applications of networked comput-
ers, especially social, educational, and information management. Understanding of the networking, com-
puting, and software infrastructure enabling con-
temporary networked applications, with the goal of empower-
ing the student to use these technologies ef-
fectively in their personal and professional life. Related policy, legal, economic, and industry issues will be cov-
ered. A listed as Information Systems C106. (F,SP)

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: Physics 7B, Math 54; Chemistry 1B recommended. Fundamental laws of thermodynamics for simple sub-
stances; application to flow processes and to nonre-
acting mixtures; statistical thermodynamics of ideal gases and crystals; solid; chemical thermodynamics; multiphase and multicomponent equilibria in reacting systems; electrochemistry. Spon-
soring Departments: Materials Science and Engi-
neering and Nuclear Engineering. (F,SP) Messerschmidt

117. Methods of Engineering Analysis. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 53, 54. Methods of theo-
retical engineering analysis; techniques for analyzing partial differential equations and the use of special functions related to engineering systems. Sponsoring
Department: Mechanical Engineering. (F) Papat-
dopoulos

119. Applied Java Programming. (3) Three hours of lecture and one hour of voluntary discussion per week. Prerequisites: Mathematics 1A-1B. This course is de-
dicated to teaching students Java programming. This course provides a concise introduction to object-oriented programming and the basics of Java programming. Advanced features of Java program-
ing, including graphical user interface with Swing, multithreading, distributed objects, remote method invocation, and linking applications or applets to native methods in C, are also covered. The course covers design and assignments emphasizing object-oriented design and development techniques and tools and computational methods that can be used for engineering analysis, intelligent manufacturing and other types of systems modeling or data analysis. The final two weeks of the course include capstone projects and case studies that illustrate application of Java pro-
grammming to engineering design analysis, intelligent...
manufacturing, system simulation and/or other application areas. (SP) Carey

120. Principles of Engineering Economics. (3) Students will receive 2 units for 120 after taking Civil Engineering 130 or consent of instructor. Three hours of lecture per week plus drop in laboratory. Prerequisites: 28, 45. Advanced graphic tools for engineering design. Advanced descriptive geometry. Surface and solids modeling. Spreadsheet programming and parametric design. Introduction to linear finite element analysis for stress and deflection in homogeneous materials. Presentation using computer animation and multimedia techniques. Sponsored by Mechanical Engineering. (SP) Lieu

127. Supplementary Work in Upper Division Engineering. (1-3) Course may be repeated for credit. Prerequisite: Limited to students who must make up a fraction of a required upper division course. May be taken with permission of the Dean of the College of Engineering. Students with partial credit in an upper division course may take the work under this heading. (F,SP) Staff

C153. Principles of Bioengineering. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 1B, Physics 7C, Mathematics 53, 54; junior standing. Basic analytical tools and applications in biological systems. Biomechanics, physiological fluid mechanics, biomaterials, bio-heat transfer, physiological mass transport, biological network modeling, physiological control system. Also listed as Bioengineering 153. (F,SP) Liepmann

C164. Marine Statics and Structures. (3) Students will receive 2 units of credit for 164 after taking Mechanical Engineering 151. Three hours of lecture per week. Prerequisites: Civil Engineering 130 or consent of instructor. Formerly 164. Terminology of hull forms, conditions of static equilibrium and stability of floating submerged bodies. Effects of damage on stability. Structural loads and response. Box girders, T-girders and orthogonal plate bending and buckling. Also listed as Mechanical Engineering C164. (F) Mansour

166. Engineering Project Management. (3) Five hours of laboratory and one hour of lecture per week. Prerequisite: Junior standing in engineering and consent of instructor. Students will be mentors to the students enrolled in the course Engineering Design Studio. Developing and presenting a technical lecture. Control of scope/schedule/budget of engineering projects. Testing, building and motivating the project team. The design review, prototype testing and qualification, product liability. No final examination. Sponsoring department: Mechanical Engineering and Electrical Engineering and Computer Sciences. (F,SP) Staff

177. Advanced Programming with MATLAB. (3) Three hours of lecture and one voluntary discussion/computer laboratory per week. Prerequisites: 77N, Mathematics 53, 54 (one of these may be taken concurrently with consent of instructor). The course builds an understanding of the classroom material and provides an introduction to object-oriented programming as well as exposes 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 introductory concepts are reinforced by developing and debugging simple graphical features in 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, the emphasis will be placed on examples and homework assignments from engineering disciplines. (SP) Frankel, Packard

191. Engineering Ethics. (3) Three hours of lecture and one hour consultation per week. Prerequisites: Upper division standing in an engineering or science discipline, or consent of instructor. Formerly 191A. Historical, regional, and cultural perspectives on ethics. The ethics of technology, technology and the environment, technology and the effect of technology on social, cultural, and economic systems. Environmental impact of engineering activities. The role of the engineer in controlling technology. Ethical and legal responsibilities of the engineering professional. Engineering codes of ethical conduct. Avoiding ethical conflicts in the workplace. (F,SP) Uddell

192. Writing for the Technical Press. (3) Three hours of lecture per week. Prerequisites: 190 or consent of instructor. Introduction to writing about technology, engineering, and science for technical, trade, consumer, and news magazines. Topics include writing and reporting skills, how to organize arguments, journalistic ethics, and the structure of the magazine publishing business. Students will research and compose several articles in technical areas of their choice, participate in editorial-style meetings, and analyze/edit each other’s writing. (F,SP) Liepmann

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 of more of the following candidate articles, edit articles, enter articles into UNIX computer system for typesetting, draw technical illustrations, photography, issue layout, issue paste-up, write articles on assignment, advertising, design and publishing. (F,SP) Staff

195. Science, Technology, and Culture. (3) Three hours of lecture/discussion per week. Prerequisites: English 1A or equivalent; a course in physical or biological sciences and consent of instructor. This course is designed (1) to encourage students to see science and technology in a broad cultural context and from a variety of perspectives (historical, philosophical, ethical, etc.) and (2) to help them develop their writing skills. Science and its ways of knowing; science, technology, and community; science, technology and the conscience; technology and the environment; the two cultures. Sponsoring department: Engineering and Computer Science. (F,SP) Staff

201. Ocean Engineering Seminar. (2,3) Two hours of lecture or two hours of lecture and one hour consultation per week. Prerequisites: Enrollment in Ocean Engineering Master of Engineering Program or consent of instructor. Lectures on new developments in ocean engineering. The optional third unit covers the analysis of specific ocean engineering structures and their interaction. The additional unit will require that students meet with the instructor one hour extra per week to work on an individual project. Topics covered: ice, mechanical properties, wave and tidal forces, and other ice actions on structures. Term paper required. Sponsoring department: Engineering Interdisciplinary Studies. (SP) Staff

201N. Ocean Engineering Seminar. (2,3) Three hours of lecture or three hours of lecture and one hour consultation per week. Prerequisites: Enrollment in Ocean Engineering Master of Engineering Program or consent of instructor. Lectures on new developments in ocean engineering. The optional third unit covers the analysis of specific ocean engineering structures and their interaction. The additional unit will require that students meet with the instructor one hour extra per week to work on an individual project. Topics covered: ice, mechanical properties, wave and tidal forces, and other ice actions on structures. Term paper required. Sponsoring department: Engineering Interdisciplinary Studies. (SP) Staff

217. Magnetic Materials. (3) Three hours of lecture per week. A comprehensive introduction to magnetism, magnetic properties of materials, magnetization. A description of magnetic phenomena on a macroscopic scale will be followed by discussions of modern experimental methods for magnetic measurements. Intrinsinc and phenomenological concepts of magnetism will be developed, including electronic magnetic moments, classical, quantum, and band theories of magnetic behavior. Ordered magnetic materials will be explored in detail. Sponsoring department: Engineering Interdisciplinary Studies. Also listed as Applied Science and Technology C210. (SP) Staff

C219. Diffusion: History, Physics, and Mathematics. (3) Three hours of lecture per week. Prerequisites: Graduate standing. Engineering students: consent of instructor. Formerly C220. Fourier’s heat-diffusion model as a basis for studying diverse physical, biological, and social systems. Basic concepts and equations of ordinary differential equations and justification and solution methods. Evolution of ideas as revealed by papers of historical significance. Heat, chemical, solid and gas diffusion, flow in porous media, and stochastic differential equations. Students to explore their individual interests in diffusion (experimental, theoretical, or historical) within a broader scientific context. Also listed as Materials Science and Engineering C219. (SP) Narasimhan


240. Fundamentals of Multiphase Flow in Earth Systems. (3) Three hours of lecture per week. Prerequisites: Graduate standing; Mathematics 53, 54, or equivalent. Chemical Engineering 140 or equivalent. Formerly Mineral Engineering 251. Fundamental physics and mathematics of multiphase, nonisothermal flow of immiscible fluids in porous media. Pore level characterization of porous media; pore networks; invasion percolation in drainage and imbibition; description of capillary pressures and relative permeability in two and three phase flow; upscaled; method of coherence in three phase flow; nonisothermal flow with phase change. MATLAB used as the computing environment for all course work. Sponsoring Department: Civil and Environmental Engineering. (F) Patzek

241. Mathematical and Numerical Methods in Earth Sciences. (4) Three hours of lecture and one hour of computer laboratory per week. Prerequisites: Graduate standing: Mathematics 53, 54, or equivalent. 240 or equivalent is strongly recommended. Fundamentals of mathematical theory and hands-on development of numerical skills. MATLAB is used as the computing environment for all course work. Difference equations, convergence theorem; continuum transport equations; basics of volume averaging; dimensional and insessional analysis; self-similarity and scaling; semi-analytic models of conservation transport and chemical models of boundary-value problems for the Convection-Dispersion-Adsorption equation. Sponsoring Department: Civil and Environmental Engineering. (SP) Patzek

B prefix=laboratory course for business majors C prefix=cross-listed course P prefix=course satisfies R&C requirement A prefix=satisfies AG prerequisite S prefix=satisfied by same course R prefix=course satisfies R&C requirement
Engineering—Double Major Programs

College of Engineering

Engineering Student Affairs Office: 308 McLaughlin Hall #1023, (510) 642-7594

Overview

Double Major Programs of Study. The Double Major Program is designed for students who wish to undertake study in two major 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 two fields. While they may require slightly increased course loads, they can be completed in four years. Both majors are shown on the student’s transcript of record. Admission to double major programs is closed to freshmen but open to transfer students. Continuing students may petition for change to double major programs in the last semester of the sophomore year. For complete information about programs of study under the double major, see the Announcements of the College of Engineering.

Students may prepare for a bachelor’s degree combining study in the following areas:

- Electrical Engineering and Computer Sciences/Information Systems, Computer Engineering
- Materials Science and Engineering, Mechanical Engineering, Nuclear Engineering
- Electrical Engineering and Computer Sciences/Nuclear Engineering

In addition to the double major programs within the College of Engineering listed above, two double major curricula involving the College of Engineering and the College of Chemistry are offered. These are: (1) Materials Science and Engineering/Chemical Engineering; and (2) Nuclear Engineering/Chemical Engineering. Details on these curricula can be found in the Announcements of the College of Chemistry and College of Engineering. Students must apply for admission to the College of Chemistry for these double major programs.

Engineering—Interdisciplinary Studies

College of Engineering

Program Office: 230 Bechtel Engineering Center #1708, College of Engineering, University of California, Berkeley; Berkeley, CA 94720-1708.

Overview

Interdisciplinary studies involving various branches of engineering, the natural sciences and mathematics, the biological sciences, the social sciences, and the humanities are coordinated through the Meakin Interdisciplinary Studies Center. The Meakin Interdisciplinary Studies Center has four main goals: (1) to promote the knowledge and skills needed to function in an interdisci-
progressive creation of a business plan by each project team. Team progress presentations by one person on each team (management, finance, etc.) will be made on a rotating basis. (F.S.P.) Staff

190. Technical Communication. (3) Three hours of lecture per week. Prerequisites: English 1A or equivalent course; upper division standing. Principles of technical communication: analyzing one’s audience; organizing material; developing a clear, economical style; proper formats and rhetorical strategies for formal technical reports, feasibility studies, abstracts, descriptions and instructions, proposals, letters, and memos. Practice in oral presentations to technical and nontechnical audiences. Sponsoring Department: Engineering Interdisciplinary Studies. (F.S.P) Staff

Graduate Courses

296. Operational Management of Technology. (3) Three hours of lecture per week. Prerequisites: Graduate standing in Engineering or Business Administration. The engineering process for realizing new technologies and product concepts is a key link in the innovation chain. The engineering interface to technology sources and market requirements is addressed. An integrated approach to the tools and organizational issues in the engineering infrastructure is framed as an information management task. Management roles are focused on quality and minimizing concept-to-market time. The course does not assume specialist technical knowledge. (F) Staff

Interdepartmental Study Courses

Upper Division Courses

IDS 110. Introduction to Computers. (3) Students who have completed courses in Computer Science 7, 8, or the 50 series will receive no credit for IDS 110. Three hours of lecture plus four hours of laboratory per week. Prerequisites: Upper division standing. Primarily for students in the social sciences and humanities and in the professional schools other than Engineering. This course covers the fundamentals of computing and information technology. Structure and function of computing systems. Elements of programming. Application programs. Examples are drawn mainly from word processing, databases, management, electronic spreadsheet, graphics and simulation, and telecommunications. Sponsoring departments: Engineering Interdisciplinary Studies and Education. Staff

IDS 140. Technical Communication for Non-Native Speakers of English. (3) Three hours of lecture per week. Prerequisites: English 1A, or equivalent course; upper division or graduate standing. Emphasis on improving language skills and use of the rhetorical conventions of technical presentations. This course is designed to prepare non-native speakers for the more advanced work in Engineering 190. Sponsoring departments: College Writing and the College of Engineering. (F.S.P) Jones

Graduate Courses

IDS 294. Management of Technology Joint Learning Seminar. (3) One hour of lecture and three hours of laboratory per week. Prerequisites: Business Administration 296 or Engineering 206 or 297, or consent of instructor. Students, under the guidance of two faculty advisers (Bus. Adm. and Engr.) will assist a Bay Area corporation in a central issue in the management of technology. Applications of classroom work to the solution of real issues. Will provide an opportunity to further the student’s understanding of the scope and complexity of technology management process. Comprehensive report and presentation required. Sponsoring departments: Engineering and Business Administration.

IDS 296. Management of Innovation and Policy. (3) Three hours of lecture per week. Prerequisites: Graduate standing in Business Administration or Engineering. This course is designed to introduce students to the innovation process and its management. It draws upon experience from industry and business and integrates them in a fashion which will generate key insights into how technology can be developed and managed. Sponsoring departments: Engineering and Business Administration.

Engineering Science (College of Engineering)

Program Office: 230 Bechtel Engineering Center #1708, (510) 642-8790 http://www.eecs.berkeley.edu/engsci/

Associate Dean: David A. Dornfeld, Ph.D., dornfeld@me.berkeley.edu

Programs for the Bachelor’s Degree

Each undergraduate Engineering Science curriculum is multidisciplinary and departmental. The programs include closely related fields of the natural sciences, mathematics, physics, and engineering. The options offered within engineering science prepare students especially for advanced graduate study in engineering or the natural sciences. The Engineering Science options are computational engineering science, engineering mathematics and statistics, engineering physics, and environmental engineering science. Students seeking information on bioengineering should refer to the Department of Bioengineering section of this catalog.

Applicants at the freshman level may apply to any of the engineering science options. Students will be advanced to the upper division in engineering science upon satisfactory completion of the lower division requirements and achievement of a minimum 3.0 overall grade-point average.

Computational Engineering Science

This new interdisciplinary program recognizes the growing importance of computation as a methodology for attacking complex scientific and engineering problems. Combined with mathematical modeling and experimental observations, scientific computation enables engineers and scientists to solve problems that are otherwise intractable. The Computational Engineering Science Program provides a solid foundation in mathematics, the sciences, and engineering and fosters skills required for modeling, simulating, and solving complex problems. The emphasis is on the computation of science rather than the science of computation (i.e., computer science). Students have the opportunity to select courses from a wide variety of disciplines. (see the section on clusters in the detailed description of the program in the Announcement of the College of Engineering) During the first year, the program provides a sound basis for graduation studies in engineering and the applied sciences. Additionally, it nurtures skills that are needed in large-scale technological modeling and simulation of situations that occur in industrial and natural laboratories.

Lower Division.

Mathematics 1A-1B, 53, 54, 55 (or Statistics 134 or Math 110 or Computer Science 70); Physics 7A-7B-7C; Chemistry 1A, 1B (or Engineering 45); Biology 1A; Engineering 39B, 37N, 92; Computer Science 161B; humanities and social sciences electives. For further details, see the Announcement of the College of Engineering.

Upper Division.

Mathematics 128A, 128B; Engineering 170A, 170B, 190; core and cluster courses including capstone course; humanities and social sciences electives. For further details, see the Announcement of the College of Engineering.

Engineering Mathematics and Statistics

This interdisciplinary program offers students an opportunity to study pure and applied mathematics as essential components of modern engineering. The balance between pure mathematics, applied mathematics, and scientific applications allows the student to individualize a program of study in theory or applications or both. The program provides a broad foundation for graduate studies in theoretical branches of engineering, as well as in mathematics.

Lower Division.

Mathematics 1A-1B, 53, 54; Physics 7A-7B-7C; Chemistry 1A; two lower division computer science courses approved by an adviser; an English composition course chosen with a selection of engineering course options that prepare the student to tackle the complex problems faced by society. Because the program emphasizes science and mathematics, students are well-prepared to pursue graduate studies in physics or engineering. With the proper choice of electives, the program also enables a student to transfer to a more traditional field of engineering should such an interest develop.

Lower Division.

Mathematics 1A-1B, 53, 54; Physics 7A-7B-7C; Chemistry 1A-1B; one lower division computer science course approved by an adviser; an English composition course chosen from the current approved college list (List E). Please consult the Announcement of the College of Engineering for further information.

Upper Division.

Mathematics 104 or 185 or 121A-121B; Physics 110A-110B or Electrical Engineering 117A-117B, 117E; Mechanical Engineering 104 or Physics 105; Nuclear Engineering 104A or Physics 111 or Electrical Engineering 135; Physics 112 or Engineering 115; Physics 141A or Materials Science and Engineering 111; Mechanical Engineering 106 or 185; 14 units of upper division courses in the Department of Physics.

Environmental Engineering Science

This is a multidisciplinary field requiring an integration of physical, chemical, and biological principles with engineering analysis for environmental protection and restoration. The program incorporates courses from many departments on campus to create a discipline that is rigorously based in science and engineering, while addressing a wide variety of environmental problems. This new field of environmental engineering undergraduate options exist in the chemical, civil, mechanical, and materials science and engineering departments, the engineering and curriculum provides a student the foundation in the sciences than is possible in these departments. This major prepares the student for a career or graduate study in many environmental areas.

Lower Division.

Mathematics 1A-1B, 53, 54; Chemistry 1A and 1B or 2A; Engineering 77 or Chemical Engineering 140; Physics 7A-7B; Biology 1B; Engineering 11, 12, 19; two basic science electives from approved list (Physics 7C, Biology 1A, Chemistry 38, Chemistry 5, or Geology 50 and 50L); English composition course taken from the current approved college list of courses (List E).

Upper Division.

Civil Engineering 100 or Mechanical Engineering 106 or Chemical Engineering 150A or 150B; Engineering 36, Engineering 113, Engineering 114; Engineering 104; Electrical Engineering 100; Chemical Engineering 141 or Engineering 115 or Mechanical Engineering 105; Civil Engineering 111; Mathematics 121A-121B or Mathematics 137A; Mathematics 128A or Statistics 101 and Statistics 102 or Engineering 117 and Engineering 118; Civil Engineering / 225

*Professor of the Graduate School

†Recipient of Distinguished Teaching Award
General Degree Requirements

All engineering science programs must include six courses of at least 3 units each in humanities and social studies selected from an approved list of courses. Of these, at least one course must be an English composition course taken from the current approved college list (List E), one must be from a list of selected courses in History and Culture, one must be from a list of selected courses in Western Literature and Values, and two must be upper division courses. The English composition course and either the course in History and Culture or that in Literature and Values must be taken for a letter grade. At least one of which is in the upper division, must be taken from a single department.

All engineering science programs also must include at least 40 units of approved technical subjects (mathematics, statistics, science, engineering), of which at least 16 units are upper division engineering courses (required upper division courses may be included). For further details, see the Announcement of the College of Engineering.

Engineering—Undeclared

(College of Engineering)

Program Office: 230 Bechtel Engineering Center #1708, (510) 642-6790

Associate Dean: David A. Dornfeld, Ph.D., dornfeld@college.berkeley.edu

This lower division program is intended for academically strong students who are interested in pursuing an engineering education—but who are not yet ready to choose a specialization within engineering. The undeclared option supplements the freshman-sophomore curriculum with seminars and attractor courses (courses designed to attract students to a major) that introduce the student to the various engineering fields. By their junior year, students must transfer into a degree program. The programs available for transfer within the College of Engineering include civil engineering, computational engineering science, earth resources engineering, electrical engineering and computer sciences, engineering mathematics and statistics, engineering physics, industrial engineering and operations research, manufacturing engineering, materials science and engineering, mechanical engineering, nuclear engineering and the engineering double majors.

Lower Division. Mathematics 1A-B, 53, 54: Chemistry 1A; two lower division computer science courses approved by an adviser; Physics 7A-7B; Engineering 92; Humanities and Social Studies electives; attractor course; technical electives. Please consult the Announcement of the College of Engineering for the latest information on this program.

English

(College of Letters and Sciences)

Undergraduate Office: 322 Wheeler Hall, (510) 642-3467
Graduate Office: 319 Wheeler Hall, (510) 642-4005
http://english.berkeley.edu

Professors

Janet Adelman, Ph.D. Yale University. Shakespeare, English Renaissance literature

Charles F. Altei, Ph.D. University of North Carolina. Modern and contemporary literature, literary theory, history of ideas

Joel Altman, Ph.D. Stanford University. English Renaissance

Ann Bartfield, Ph.D. University of Wisconsin. Literary and linguistic theories

Michael A. Berman, Ph.D. University of Pennsylvania. 19th-century poetics, literary theory, comparative literature

Stephen Booth, Ph.D. Harvard University. Aesthetics, Renaissance literature

Michelle Brumfield, Ph.D. SUNY Buffalo. American literature

Carol Christ, Ph.D. Yale University. Victorian literature, women in literature

Ian Duncan, Ph.D. University of Yale. British novel, 19th century

Mary Catherine Gallagher, Ph.D. University of California, Berkeley. 19th-century English

Richard Helman, Ph.D. Yale University. English Renaissance, Shakespeare

Robert Hass, Ph.D. Stanford University. Poetry, poetry writing

Lorna Hutgin, Ph.D. Oxford University. 16th- and 17th-century Renaissance literature, drama

Ron Loewenthal, Ph.D. Harvard University. Poetry, fiction, American literature

Donald A. McCaughan, Ph.D. Rutgers University. Nonfiction, American studies, American literature

Anne Middleton, Ph.D. Harvard University. Old and Middle English literature

D. A. Miller, Ph.D. Yale University. 19th-century English and European Novel

Bharati Mukherjee, Ph.D. University of Iowa. Fiction writing, world literature in English

Alan Nelson, Ph.D. University of California, Berkeley. History of drama, Medieval English literature

John D. Niles, Ph.D. University of California, Berkeley. Old and Middle English, folklore, history of English language

*Morton D. Paley, Ph.D. Columbia University. Romantic period, literature and the visual arts

Carolyn Porter, Ph.D. Rice University. American literature

James Turner, D. Phil. Oxford University. 17th- and 18th-century literature

Alex Zander, Ph.D. University of Princeton. Modern British and American literature

P-A. J. Alpers, Ph.D. (Eremitus)

Robert Bloom, Ph.D. (Eremitus)

Julian C. Boyd, Ph.D. (Eremitus)

Joseph Coolidge, Ph.D. (Eremitus)

Frederick C. Crews, Ph.D. (Eremitus)

Philip W. Damon, Ph.D. (Eremitus)

Richard Fingesten, Ph.D. (Eremitus)

Donald M. Friedman, Ph.D. (Eremitus)

Leonard Michaels, Ph.D. (Eremitus)

Charles Musciano, Ph.D. (Emeritus)

Raymond Oliver, Ph.D. (Eremitus)

John Paterson, Ph.D. (Eremitus)

Norman Rubinstein, Ph.D. (Eremitus)

Ralph W. Rader, Ph.D. (Eremitus)

James Rennie, Ph.D. (Eremitus)

Michael A. Richmond, Ph.D. (Eremitus)

Peter D. Scott, Ph.D. (Eremitus)

Harold Stott, Ph.D. (Eremitus)

Richard Tracy, Ph.D. (Eremitus)

John Traubert, Ph.D. (Eremitus)

Associate Professors

Elizabeth F. Abel, Ph.D. Princeton University. Modern fiction

Julia Bader, Ph.D. University of California, Berkeley. Modern American literature

John M. Bishop, Ph.D. Stanford University. The novel, modern British literature

Steven Goldsmith, Ph.D. University of Pennsylvania. Romantic literature, literary theory

Dorothy Hale, Ph.D. University of California, Berkeley. American literature

Saidiha Hartman, Ph.D. Yale University. African American literature, cultural studies

Richard E. Hudson, Ph.D. University of Illinois. American novel, popular culture

Abdul Jami Mohammad, Ph.D. Brandeis University. Third World, Colonial, and African American literature

Steven Justice, Ph.D. Princeton University. Late Medieval literature

Jeffrey Knapp, Ph.D. University of California, Berkeley. English Renaissance

Celeste Langan, Ph.D. University of Pennsylvania. Romantic poetry, 19th-century British literature

Sharon Marcus, Ph.D. Johns Hopkins University. 19th-century British and French feminist theory

Christopher Nealon, Ph.D. Cornell University. 19th- and 20th-century American literature

Samuel Otter, Ph.D. Cornell University. 17th-19th century American literature

Genaro Padilla, Ph.D. University of Washington. American (especially minority) literature, Chicano literature, ethnic autobiography

Nancy Rutterberg, Ph.D. Stanford University. 17th-19th century American and British literature

Susan J. Schwik, Ph.D. Yale University. Feminist theory, American women writers, modern poetry

Katherine Snyder, Ph.D. Yale University. 19th- and 20th-century British and American literature, gender studies

Hertha Sweet Wong, Ph.D. University of Iowa. American (especially ethnic) literature, Native American literature

John T. Anson, Ph.D. (Eremitus)

Andrew Griffin, Ph.D. (Eremitus)

Oyler Knutsen, Ph.D. (Eremitus)

Assistant Professors

Stephen Best, Ph.D. University of Pennsylvania. 19th- and 20th-century American and African American literature and culture

Anne Cheng, Ph.D. University of California, Berkeley. 19th- and 20th-century British and American literature

Kamilla Elliott, Ph.D. Harvard University. 19th-century British literature, literature and film

Anne-Lise Francois, Ph.D. Princeton University. 19th-century British literature, comparative literature, 19th-century French literature

Marcial Gonzalez, Ph.D. Stanford University. 20th-century American literature, Chicano literature

Kevin Goodwin, Ph.D. Yale University. 18th-century and Romantic literature, 17th-century poetry ( Milton

Krahn Hanson, Ph.D. Stanford University. Linguistics, metrics and poetic forms

Frieda D. Carey, Ph.D. Harvard University. French literature

Colleen Lye, Ph.D. Columbia University. 20th-century literature, Asian American literature

Jennifer Miller, Ph.D. Oxford University. Medieval literature, Romance, Spenser

Senior Lecturers

Maxine Hong Kingston, A.B. University of California, Berkeley. Prose writing

Johann Reed. The writing of poetry and short fiction

Thorn Gunn, M.A. (Eremitus)

Affiliated Faculty

June Jordan (Professor of African American Studies and Women’s Studies)

Gerald Viser (Professor of Native American Studies)

Department Overview

The Department of English offers courses in literature, in language, and in writing. Our courses in literature have many different focuses: major authors, historical periods, genres, critical theories and methods, as well as cultural and multicultural studies. Courses in language offer instruction in both the history and the structure of the English language. Writing courses offer training in both expository and creative writing.

The major in English is designed to introduce students to the history of literature written in English, to acquaint them with a variety of historical periods and geographical and cultural regions of English language and writing, to create an awareness of methods and theories of literary and cultural analysis, and to provide continued training in critical writing. Before declaring the major, students normally must have completed the Reading and Composition requirement of the college.

The core of the major consists of seven courses: English 45A-45B-45C, a course in Shakespeare, an upper division course in literature before 1800, and two upper division seminars, English 100 and 150. English 45A-45B-45C is an intensive survey of literature in English from Chaucer through the 20th century, including British, American, and Anglophone writing. Together with the required course in Shakespeare, this sequence provides a foundation on which to build more specialized upper division work in one or more of the areas of concentration described under "Major Program" below. Prerequisites, as well as a detailed description of major requirements, may also be found there.

College Writing. Students must have fulfilled the requirement in College Writing before taking any course in the Department of English. For further information, see the College Writing listing in the Index.

Note: Specific topics in the following staff courses vary from semester to semester. English 24, 31AC, 39, 100, 102, 133T, 135AC, C136, 138, 139, 150,
A and B. (For courses that fall in specific areas, therefore can be used to meet both requirements, the 11 Areas of Concentration listed above, and necessarily, these courses will fall within at least one of the major courses. For a description of the areas and a list of the required courses, i.e., 45A-45B-45C, Shakespeare, the pre-1800 course, English 100, 150, or any of the three courses within a student’s area of concentration.

Summer Session. Only one Summer Session course normally may be counted toward fulfilling the 12-course major requirements.

EAP Courses. Many courses taken by English majors through the UC Office of Abroad Program can be counted toward the major.

Additional Information. Further details about the major are available at the department office.

Honors Program. H195A-H195B is a two-semester course, graded IP at the end of the first semester. Students must take the two-semester course to graduate with honors in the major. Students who take H195A-H195B may apply to take English 150 as an elective course. 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 advisor 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 pass 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 English Department’s “Announcement of Classes” in early April for exact information.

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. English majors may not complete a minor in the English Department.

The minor in English requires the completion of at least five upper division courses taken for a letter grade, of which at least three must be taken at Berkeley, with a GPA of at least 2.0. Three of the five courses must fall within one of the Areas of Concentration listed under Major Requirements, IIA.

All minors must see the minor adviser to register for the program. Registration gives some priority to English minors during their Tele-BEARS appointments.

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: Enumerative 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: Medieval through Sixteenth Century (British); Seventeenth through Eighteenth Century (British and/or American); Nineteenth Century (British, American, and/or Anglophone); Twentieth Century (British, American, and/or Anglophone); one 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 course work or examination, by demonstration of advanced knowledge in one, or proficiency in two, approved languages. 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.

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 and applications from the English Graduate Office, 319 Wheeler Hall.

The M.A. Degree. The English department 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. Note: 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 courses on a pass/failed basis only. Students will find information about the grading basis of a specific class in these series in the English Department’s “Announcement of Classes,” available at pre-enrollment.

Enrollment in most writing classes is limited; consult the English Department’s “Announcement of Classes” for application procedures for these courses.

Lower Division Courses. R1A-R1B. Reading and Composition. (4) Three hours of lecture per week. Prerequisites: Passing grade in Subject A (exam or course). 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. Prerequisite: 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. Prerequisite: 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. Freshman and Sophomore Studies. (3) Three hours of lecture per week. Prerequisites: R1A or equivalent. Formerly 50. Writing-intensive introduction to the study of literature; fulfills the second half of reading and composition requirement. Highly recommended for
Upper Division Courses

141. Modes of Writing (Exposition, Fiction, Verse, etc.). (4) Course may be repeated once for credit with different instructor. Three hours of lecture per week. Prerequisites: Consent of instructor. Writing in connection with reading in recent English literature and its continental background.

142A. Advanced Composition for Potential English Teachers in Secondary Schools. (4) Three hours of lecture per week. Prerequisites: Consent of instructor, Advanced composition and methods of teaching composition. Open only to those who wish to pursue English as their single subject teaching field.

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 expository and critical writing.

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 prose nonfiction as an art.

143T. Poetry Translation Workshop. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor, willingness to translate, working knowledge of at least one foreign language, and topic to satisfy credit and English influence for writing poetry or to seek a fuller understanding of any foreign poetry by rendering it into English.

C143V. 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.” The course aims to help students become conversant with the elements of alphabetic literacy (reading and writing) and visual literacy (observing and making) in order to develop a distinctive type of visual literacy. Also listed as Visual Studies C185A, Undergrad Interdisciplinary Studies C135, and American Studies C174. This course satisfies the American cultures requirement.

Courses in Language

Note: In addition to the courses listed below, see also 105, 179, 201A, 201B, and 205A-B, 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 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

Note: Students in literature courses are expected to devote an average of nine hours per week to class preparation.

Lower Division Courses

17. Shakespeare. (4) Three hours of lecture per week. Lectures on Shakespeare and reading of his best works.

20. Modern British and American Literature. (4) Three hours of lecture per week. Lectures on and discussion of major authors of modern British and American literature.

24. Freshman Seminars. (1) Course may be repeated for credit. Each hour of seminar per week. Must be taken on a passed/not passed basis. The Berkeley 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. Berkeley 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 in an introduction to 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.

27. Introduction to the Study of Fiction. (4) Three hours of lecture per week. Lectures and discussion intended to develop the student’s ability to understand and evaluate fiction. Designed primarily for students whose major is not English, but majors and prospective majors are welcome.

28. Introduction to the Study of Drama. (4) Three hours of lecture per week. Lectures and discussion intended to develop the student’s ability to read, understand and evaluate plays. 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.

33. African American Literature and Culture. (4) Three hours of lecture per week. Major literary and cultural texts in the African American tradition from origins to the present.

39. Freshman Seminar. 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.)

44A-44B. Masterpieces of Literature. (4,4) Three hours of lecture per week. Lectures on great works of the world’s literature.

A. Classical Literature.
B. Medieval and Renaissance Literature.

45A-45C. Literature in English. (4,4,4) Three hours of lecture 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) Will count toward Environmental Science, Policy, and Management 10 requirement for the conservation and resource studies major. Students will not receive credit for C77 after taking Environmental Science, Policy, and Management 10 or C12. Three hours of lecture and one and one-half hours of discussion per week. This innovative course taught by a scientist and a humanities professor surveys current environmental issues; introduces students to the basic intellectual tools of environmental science; investigates ways the human relationship to nature has been imagined in literary and philosophical traditions; and explores new tools of scientific and literary analysis, scientific method, and imaginative thinking can clarify what is at stake in environmental issues and environmental citizenship. Also listed as Undergrad Interdisciplinary Studies C12 and Environ Sci, Policy, and Management C12.

95. Other Voices: Multicultural Literary Perspectives. (2) Course may be repeated for credit. One hour of lecture and one hour of 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

100. Junior Seminar. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Intensive study of critical and methodological problems in the study of literature. Normally fulfills one or more of the area of concentration requirements. Designed for English majors. Topics vary from semester to semester. Students should consult the department’s “Announcement of Classes” for offerings well before the beginning of the semester.

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 205B 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 fifteenth 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. Middle English literature exclusive 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.
116. Backgrounds of English Literature in the Continental Renaissance. (4) Three hours of lecture per week. A survey of the principal continental documents which are important to an understanding of the English Renaissance.

117A-117B. Shakespeare. (4) Three hours of lecture per week. A chronological survey of Shakespeare's career.

117E. Shakespeare for Non-Majors. (4) Three hours of lecture per week. General introduction to Shakespeare's plays, intended for non-majors.

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, major interplay of text and stage, and changes of concept and tragedy, influence of theatrical conditions on technique.

117S. Shakespeare. (4) Three hours of lecture per week. A survey of major American novels.

130B. American Literature: 1800-1865. (4) Three hours of lecture per week. Lectures on and discussion of American literature from the Civil War through 1860.


133A. African American Literature and Culture Before 1917. (4) Three hours of lecture per week. Major literary and cultural texts of 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 twentieth 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 the Second World War.

135AC. Literature of American Cultures. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Study of 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. This course satisfies the American cultures requirement.

136. American Studies. (4) Course may be repeated for credit with different topic and consent of instructor. Three hours of lecture per week. Studies in the relationship of literature to psychology. Three hours of lecture per week. Designed primarily for English majors. Topics will vary from semester to semester. Students should consult the department's "Announcement of Classes" well before the beginning of the semester. This 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.

152. Women Writers. (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.

152A. Women Writers. (4) Three hours of lecture per week. Topics will vary from semester to semester. Students should consult the department's "Announcement of Classes" for offerings well before the beginning of the semester.

165. 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.

165D. Special Topics. (4) Three hours of lecture per week. Study of the relationship of literature in English to psychology.

174. Literature and History. (4) Three hours of lecture per week. Study of representative forms of literature in English to psychology. Three hours of lecture per week. Designed primarily for English majors. Topics vary from semester to semester. Students should consult the department's "Announcement of Classes" well before the beginning of the semester. This course satisfies the American cultures requirement.

175. Literature and Philosophy. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Lectures, class discussions, and film viewings. Three hours of lecture per week. Study of the particular politics and sociology of individual cultures. The course may range broadly over Western literature or concentrate on one historical period.

176. Literature and Psychology. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Study of the relationship of literature in English to psychology.

177. The Language and Literature of Films. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Study in film as a mode of representing reality; cinematic techniques and the "language" of film. Three hours of lecture per week. Study of the particular politics and sociology of individual cultures. The course may range broadly over Western literature or concentrate on one historical period.

178. British and American Folklore. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Study of representative forms of folklore and oral literature among different groups of people, with emphasis on speaking people of the British Isles and North America.

179. Literature and Linguistics. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Study of the English language as a medium for literature. Topics may include rhyme, alliteration, meter, poetic syntax, metaphor, irony, the language of point of view, narrative tense, orality, literacy, etc.

180A. Autobiography. (4) Three hours of lecture per week. Lectures on and discussion of autobiographical forms.

180E. The Epic. (4) Three hours of lecture per week. Reading and discussion of epics, considering their cultural and historical contexts, the nature of their composition, and the development of the form.

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
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 representative tragic forms, techniques, and points of view.

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.

Professional Courses

310. Field Studies in Tutoring Writing. (1-3) Course may be repeated for credit with different basis. Three hours of lecture per week. Seminar topics: the writing process, responding to writing, composition theory, grammar, collaborative learning, tutoring methods. Tutors keep a weekly journal, read assigned articles, videotape their tutoring, and write a final paper. This course cannot be used toward fulfillment of the major requirements.

Honors 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 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.

99. Independent Study. (1-4) Course may be repeated for credit. Independent. Must be taken on a passed/not passed 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

H195A-H195B. Honors Course. (4,4) Three hours of lecture per week. Credit and grade to be awarded on completion of a sequence. Prerequisites: Honors; 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.

198. 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 to students who have completed 12 units of upper division English with an average grade of not less than B-. Enrollment 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 to students who have completed 12 units of upper division English with an average grade of not less than B. Meetings will be arranged. Enrollment is restricted by university regulations. Reading and 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.

Graduate Courses

200. Problems in the Study of Literature. (4) Three hours of lecture per week. Prerequisites: Open only to students in the English Ph.D. program. Approaches to literary study, including textual analysis, scholarly methodology and bibliography, critical theory and practice. 

201A. Topics in the Structure of the English Language. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week.

201B. Topics in the History of the English Language. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week.

202. History of Literary Criticism. (4) Three hours of lecture per week.

203. Graduate Readings. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Open only to students in the major. Consent of the instructor. Graduate lecture courses surveying broad areas and periods of literary history, and directing students in wide reading. Offerings vary from semester to semester. Students should consult the department’s “Announcement of Classes” for offerings well before the beginning of the semester.

205A-205B. Old English. (4,4) Three hours of lecture per week. Prerequisites: Open to undergraduates with the consent of the instructor.

211. Chaucer. (4) Three hours of lecture per week. Discussion of Chaucer’s major works.

212. Readings in Middle English. (4) Three hours of lecture per week. Rapid reading of selections in Middle English, from the twelfth century through the fifteenth.

217. Shakespeare. (4) Course may be repeated for credit. Three hours of lecture per week. Discussion of selected works of Shakespeare.

218. Milton. (4) Three hours of lecture per week. Discussion of Milton’s major works.

243A. Fiction Writing Workshop. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor, normally based on prior writings submitted. A writing workshop in fiction for graduate students.

243B. Poetry Writing Workshop. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor, normally based on prior writings submitted. A writing workshop in poetry for graduate students.

246. Graduate Proseminars. Three hours of lecture per week. Prerequisites: Open in the major chronological fields of English and American literature providing graduate instruction in scholarly and critical approaches appropriate to each field.

246C. Renaissance: Sixteenth century (excluding, or at least not prominently featuring, Shakespeare). (4)

246D. Renaissance: Seventeenth century through Milton. (4)

246E. Restoration and early 18th century. (4)

246F. Later 18th century. (4)

246G. Romantic. (4)

246H. Victorian. (4)

246I. American to 1855. (4)

246J. American from 1855. (Modern British literature will be covered in 203), (4)

250. Research Seminars. (4) Course may be repeated for credit. Two to three hours of seminar per week. Required of all Ph.D. students. Advanced study in various fields, leading to a substantial piece of writing. Offerings vary from semester to semester. Students should consult the department’s “Announcement of Classes” for offerings well before the beginning of the semester.

298. Special Studies. (4-12) Course may be repeated for credit. Independent. Normally reserved for students directly engaged upon the doctoral dissertation.

299. Special Study. (1-8) Course may be repeated for credit. Independent. Primarily for students engaged in preliminary exploration of a restricted field, involving research and the writing of a report. May not be substituted for available seminars.

302. The Teaching of Composition and Literature. (3) Course may be repeated for credit with different topic. Three hours of lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Discussion of course aims, instructional methods, grading standards, and special problems in the teaching of composition and literature, with practice in handling sample essays. When given under instructor in the English R1A-R1B Program or the English 45 series, the course will include class visitation.

602. Individual Study for Doctoral Students. (1-12) Course may be repeated for credit. Independent. 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. May not be used for unit or residence requirements for the doctoral degree.

Environmental Design

(College of Environmental Design)

Undergraduate Office: 232 Wurster Hall, (510) 642-0832
Dean: Harrison Fraker, Jr., M.F.A., F.A.A.A.
Assistant Dean—Undergraduate Administration: W. Mike Martin, 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 graduate instruction, including offerings in the applied arts and sciences. 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, 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 and landscape architecture 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 de-
Undergraduate Programs

Undergraduates enroll in a four-year curriculum leading to the Bachelor of Arts (B.A.) degree with a major in architecture, landscape architecture, or an individual major. These curricula provide a broad education base and preprofessional competency in environmental design fields. In addition, they serve as undergraduate preparation for graduate education both in the design fields and, with proper preparation, in other 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 that accredits 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-year, three-year, or two-year term of accreditation, depending on its degree of conformity with established educational standards.

Master’s degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree, which, when earned sequentially, confer an accredited professional education. However, the preprofessional degree is not, by itself, recognized as an accredited degree. Berkeley’s four-year degree is useful for those wishing a foundation in the field of architecture, as preparation for either continued education in a professional degree program or for employment options in architecturally related areas.

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 freshman-level introductory drafting. Transfer applicants who have completed 60 semester units should have completed the prerequisite course work described in the Announcement of the College of Environmental Design. As transfer admissions become increasingly competitive, the college consistently retains those applications that demonstrate 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). Enrollments in the college beyond 130 semester units is not usually permitted; consequently, California community college transfer students may receive up to 70 semester units toward the baccalaureate degree. Units above 70 receive no credit. Transfer students from other institutions who have credit in 86 semester units or more 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 these fields.

Degree Requirements. The A.B. degree programs in the architecture and landscape architecture curricula are distributed according to regulations that appear in the Announcement of the College of Environmental Design, available from the Undergraduate Degrees Office, University of California, Berkeley, 232 Wurster Hall #1800, Berkeley, CA 94720-1800.

Minor Programs. The College of Environmental Design offers several minors. Minors consist of at least five upper division courses as an optional program with two or more courses that cohere in work taken outside the major, and to give recognition to the work when it is completed. The following minors are currently being offered to all majors: city and regional planning, ecological design, environmental design in developing countries, history of the built environment, landscape architecture, and social and cultural factors in environmental design.

Admission. A prelandscape design minor is open to landscape architecture and civil engineering majors only. The landscape design minor is open to architecture majors only. For further information, contact the Undergraduate Office, 232 Wurster Hall.

Information on the courses and degree programs in architecture, city and regional planning, environmental design, and landscape architecture can be found in those sections of this catalog, as well as in the Announcement of the College of Environmental Design.

Graduate Programs

Architecture, City and Regional Planning, and Landscape Architecture each offer accredited professional degree programs that serve as the basic credential for professional practice in the respective fields. The departments also have concurrent and joint degree programs that combine professional education in one field with the master’s degree in another college or with other professional schools. An M.A. degree in design is offered for a very few students, and an interdisciplinary program offers a master’s degree in urban design.

The three departments have advanced graduate programs leading to the Ph.D. degree for students who have the capacity to engage in research and teaching. A research M.S. degree in architecture also serves as the basic credential for professional practice in the respective fields. The departments also have concurrent and joint degree programs that combine professional education in one field with the master’s degree in another college or with other professional schools. An M.A. degree in design is offered for a very few students, and an interdisciplinary program offers a master’s degree in urban design.

An undergraduate major in architecture or landscape architecture is not a prerequisite for admission to graduate study in these fields.

Organizational Units

Architecture

Department Office: 232 Wurster Hall, (510) 642-4942
Graduate Office: 370 Wurster Hall, (510) 642-5577 Chair: Charles C. Benton, M.Arch.

City and Regional Planning

Department Office: 228 Wurster Hall, (510) 642-3256
Graduate Office: 228 Wurster Hall, (510) 643-9440 Chair: Frederick C. Collignon, Ph.D., A.I.C.P.

Landscape Architecture and Environmental Planning

Department Office: 202 Wurster Hall, (510) 642-4022
Graduate Office: 206 Wurster Hall, (510) 642-2965 Chair: Walter Hood, M.L.A.

The college faculty has established several courses for college credit. A course of lower division work that is prerequisite 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 are similar standing as environmental design courses, rather than departmental offerings. Though these courses are typically staffed by more than one department, they are administered by only one. For information regarding ED 104, 134, or 135, contact the Department of Landscape Architecture. For information regarding ED 201, 251, and 252 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.

For information on the Master of Urban Design degree, see the Urban Design section of this catalog.

Lower Division Courses

1. Introduction to Environmental Design. (3) Three hours of lecture and two hours of discussion. Introductory survey course. Environmental awareness and environmental design. Berkeley campus used for case study. (F) Staff

4. People and Environment. (3) Three hours of lecture and one hour of discussion per week. Survey of relationships between man and the environment with emphasis on areas of environmental conflict. Environmental awareness and environmental design. Berkeley campus used for case study. (SP) Staff

11A. Introduction to Drawing. (4) Three hours of lecture and twelve hours of studio per week. Prerequisites: 1 or 4. Introductory studio course: freehand drawing, perspective, color, and design; theories of representation and the use of visual means to analyze and convey ideas regarding the environment. (F,SP)

11B. Introduction to Design. (4) Three hours of lecture, six hours of studio, and one hour of seminar per week. Prerequisites: 11A. A seminar in the basic concepts and conventions of graphic representation and model building as related to the study of architecture and landscape architecture. Drawing in plan, section, elevation, axonometric and perspective. Design projects addressing concepts of order, site analysis, scale, structure, rhythm, detail, culture, and landscape. (F,SP)

Upper Division Courses

101A. 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 the 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 to bring their current academic interests into play when writing about environmental design. Weekly assignments include prose readings, generally essays related to life experience. Brief readings and discussions during each class, along with weekly writing assignments of 5-5 pages of prose will illustrate the skills involved in the craft of writing. (F) Litchez

101B. Writing about Environmental Design: Longer Compositions. (2-4) Course may be repeated once for credit. Three hours of laboratory 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 addendum to 101A: Short Compositions. Enrolled students are required or have elected to write an undergraduate thesis. The objective of the course is to assist with the process by defining a topic and constructing a research agenda by which the topic is explored and developed as a 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

104. Site Planning. (5) Two hours of lecture and six hours of studio per week. Prerequisites: Landscape Architecture 103 or Architecture 100B or equivalent. The focus of this studio, co-taught by the Department of Architecture and the Department of Landscape Architecture, is the role of natural factors in shaping site development and design. Problems might include a new edge-of-the-city housing development, an office park, or an environmentally difficult site within a city. Lecture modules on selected professional topics are integrated into the course.
Environmental Health Sciences
(School of Public Health, Interdepartmental Graduate Groups)

Department Office: 760 University Hall, (510) 643-5160
Chair: S. Katherine Hammond, Ph.D.

Professors
John Casida, Ph.D. (Environmental Science, Policy, and Management)
Brenda Eskesen, Ph.D. (Public Health)
James Hunt, Ph.D. (Civil and Environmental Engineering)
Katherine Kostial, Ph.D. (Public Health)
William Nazaroff, Ph.D. (Environmental Engineering)
James Rhode, Ph.D. (Public Health)
Allen Smith, M.D. (Public Health)
Kirk Smith, Ph.D. (Public Health)
Maryn Smith, Ph.D. (Public Health)
Robert Sparr, Ph.D. (Public Health)
Ira Tager, Ph.D. (Public Health)
Edward Wei, Ph.D. (Public Health)

Affiliated Professor
David Rempel, M.D. (University of California, San Francisco)

Program Overview
Academic degree programs in the Graduate Group in Environmental Health Sciences are recommended for individuals with clear research orientations who wish to complete a work of 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 is contingent upon successful completion of the M.S. requirements.) EHS is administered within the Divisional Graduate Program of the School of Public Health. Although students receive their academic degrees from the graduate group (under the direction of the Graduate Division of the Berkeley campus), students are also affiliated with and apply to the School of Public Health.

Environmental Science, Policy, and Management
(College of Natural Resources)

Department Office: 140 Mulford Hall, (510) 643-2643
Undergraduate Student Services: 260 Mulford Hall, (510) 643-4249
Graduate Student Services: 133 Mulford Hall, (510) 643-6417
Chair: James W. Bartolome, Ph.D.

Vice Chair for Instruction: Lynn Huntsinger, Ph.D.

Professors
Barbara Hall-Alenso, Ph.D. (University of California, Berkeley. Rangeland ecology and management)
Ronald G. Armstrong, Ph.D. (University of California, Riverside. Pedology and isotope geochemistry)
Reginald H. Barrett, Ph.D. (University of Berkeley. Wildlife biology and management)
James W. Bartolome, Ph.D. (University of California, Berkeley. Rangeland ecology and management)
Frank C. Beal, Ph.D. (State University of New York, Syracuse. Forest products and wood technology)
Gregory S. Biging, Ph.D. (University of Wisconsin, Madison. Forest biometrics and remote sensing)
John E. Caada, Ph.D. (University of Wisconsin, Madison. Pest and plant chemistry and toxicology)
Donald L. Daish, Ph.D. (University of California, Berkeley. Forest entomology, biological control)
Harvey E. Doner, Ph.D. (University of California, Riverside. Soil chemistry, trace elements, elemental associations/distributions)
Sally K. Fairall, Ph.D. (Duke University. Conservation policy, public land administration)
Mary K. Firestone, Ph.D. (Michigan State University. Soil microbiology, nutrient cycling)
Louise P. Fortman, Ph.D. (Michigan State University. Natural resource sociology)
Gordon W. Franklin, Ph.D. (University of Berkeley. Urban entomology)
Inez Fung, S.D. (Massachusetts Institute of Technology. Climate changes, biogeochemical cycles)
Wayne M. Gatz, Ph.D. (University of Wisconsin, Madison. Forest entomology, biological control)

Environmental History, Philosophy, Ethics
(College of Environmental Design)

Department Office: 760 University Hall, (510) 643-5160
Chair: S. Katherine Hammond, Ph.D.

Professors
John Casida, Ph.D. (Environmental Science, Policy, and Management)
Brenda Eskesen, Ph.D. (Public Health)
James Hunt, Ph.D. (Civil and Environmental Engineering)
Katherine Kostial, Ph.D. (Public Health)
William Nazaroff, Ph.D. (Environmental Engineering)
James Rhode, Ph.D. (Public Health)
Allen Smith, M.D. (Public Health)
Kirk Smith, Ph.D. (Public Health)
Maryn Smith, Ph.D. (Public Health)
Robert Sparr, Ph.D. (Public Health)
Ira Tager, Ph.D. (Public Health)
Edward Wei, Ph.D. (Public Health)

Affiliated Professor
David Rempel, M.D. (University of California, San Francisco)

Program Overview
Academic degree programs in the Graduate Group in Environmental Health Sciences are recommended for individuals with clear research orientations who wish to complete a work of 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 is contingent upon successful completion of the M.S. requirements.) EHS is administered within the Divisional Graduate Program of the School of Public Health. Although students receive their academic degrees from the graduate group (under the direction of the Graduate Division of the Berkeley campus), students are also affiliated with and apply to the School of Public Health.
The Department of Environmental Science, Policy, and Management (ESPM) brings together a range of biological, physical, and social sciences to provide educational, research, and extension programs in:

- fundamental processes of ecosystem functioning;
- identification, protection, and sustainable uses of forest, rangeland, and managed ecosystems;
- insect biology;
- interactions of natural resources, human economics, and social systems.

The department is organized into four divisions for the promotion of research programs. These divisions are:

- Ecosystem Science
- Forest Science
- Insect Biology
- Resource Institutions, Policy, and Management

The multidisciplinary strength and vertical integration, from the molecular to landscape levels, offers students in ESPM an educational opportunity for future leadership roles in conservation and management of natural resources. ESPM provides majors in which students can develop interdisciplinary educational backgrounds to address the science, policy, and management of natural resources.

The Faculty

The ESPM faculty have expertise in diverse areas of critical importance to environmental issues. Their multidisciplinary strength will develop in the program's students the intellectual leadership required to conserve and wisely manage the earth's resources and to raise the environmental and scientific literacy of all students at Berkeley.

Facilities

The Department of Environmental Science, Policy, and Management occupies space in Giannini Hall, Mulford Hall, Hilgard Hall, and Wellman Hall. In addition to laboratories and classrooms, the facilities include outstanding libraries and collections: the Biological Science and Natural Resource Library has well-equipped chemical and microbiological resources, as well as well-equipped chemical and microbiological laboratories. There are also extensive herbaria, wildlife specimen collections, an entomological insectary, myology 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, Whitaker’s Forest adjacent to Sequoia National Park, the Howard Research Center, Wilts, Russell Reservation near Lafayette, and the Baker Forest adjacent to the department’s Summer Camp property. Berkeley’s location also provides easy access to several private and public resource management and conservation agencies including the U.S. Forest Service, the U.S. Fish and Wildlife Service, the U.S. National Park Service, the California Department of Forestry and Fire Protection, and the California Department of Fish and Game.

Undergraduate Programs

Courses offered by the Department of ESPM serve students in 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.

Transfer Applicants

Transfer candidates must complete all lower division requirements for their intended major and may be denied admission if they have not done so. The Intersegmental General Transfer Curriculum (IGT/C) is not an appropriate pattern for students applying to ESPM. In cases where the transfer institution does not have a course equivalent to a specific prerequisite for the major, the applicant will be required to remedy the deficiency by taking the course work the first semester of enrollment at Berkeley.

Major in Conservation and Resource Studies

Chief Adviser: 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, agriculture, energy, technology, societal institutions, and cultural values. Students will be prepared for future leadership roles in conservation and management of natural resources.

Course requirements for the major include ESPM 10, 90, 100, and 194. In the freshman and sophomore years, students will be expected to take two courses in reading and writing, one course in calculus or statistics, a minimum of two courses in the biological sciences and two in the social sciences. In addition, students must take two courses from any two of the following three areas: physical sciences, humanities, analytical reasoning; and two courses preparatory to the individual areas of interest. In the junior and senior years, students will concentrate on their areas of interest. A more detailed statement of major requirements is available from the department office. Applications for on-campus transfers for the following academic year must be submitted to the Undergraduate Services Office, 260B Mulford Hall, (510) 642-4249, for deadlines each semester.

Minor Program.

A minor in conservation and resource studies is available to any Berkeley student in good academic standing. Requirements for the minor consist of the completion of a minimum of five courses related to conservation studies totaling a minimum of 12 units. One of the five courses must be ESPM 10 and at least three courses must be upper division. All courses must be taken for a letter grade and must average a minimum of 2.0 grade points over all. Interested students should obtain the requirements from the department office. Students applying to ESPM must complete all lower division courses before starting the minor. Students will be awarded the minor following satisfactory completion and certification from the department.

Major in Forestry

Chief Adviser: Joe McBride

The major in forestry is one of the top-rated programs of its kind in the country. It is designed to prepare students to manage forests and wildlands to produce wood, water, forage, wildlife, recreation opportunities, and other environmental benefits. Graduates from the major are employed in a variety of careers.
by the U.S. Forest Service, the U.S. Fish and Wildlife Service, the U.S. Bureau of Land Management, the U.S. National Park Service, various state and local agencies, and private industries, international development and conservation agencies, private timber companies, consulting firms, and environmental organizations.

Accreditation and Licensing. Established in 1914, the forestry major at Berkeley was the first forestry degree program to be accredited by the Society of American Foresters. Completion of the Bachelor of Science degree in forestry provides four years of credit towards meeting the required seven years of qualifying education or professional experience for licensing as a professional forester in California. An additional year of credit towards licensing may be obtained by completing the Master of Forestry degree. By careful selection of electives, students who complete the Bachelor of Science in forestry degree can meet the U.S. Civil Service and state requirements for the forester position.

Preparatory Program. During the freshman and sophomore years students are expected to complete Biology 1A, 1B, Chemistry 1A, 3A, ESPM 50AC, and ESPM 60; 4 units of economics, 8 units of upper division courses, 6 units of English, and 4 units of statistics. Additionally, freshmen on the Berkeley campus are required to take ESPM 11 (Forest and Wildland Resource Conservation). Students eligible to take courses in computer programming, Sophomores may also elect to take ESPM 108A (Tree Taxonomy and Growth), ESPM 114 (Wildlife Ecology), or ESPM 186 (Principles of Reading and Composition), provided they meet the prerequisites for these courses.

Summer Field Program. In the summer between the sophomore and junior years, students must complete the eight-week, 10-unit summer field program in the northern Sierra Nevada. The program emphasizes the acquisition of practical field skills and the integration of knowledge about soils, water, forests, wildlife, and parks. The program includes several field trips to the surrounding pine and fir forests of the Plumas National Forest.

Upper Division Course Work. Forty units of core upper division course work are required in the last two years of the program. In addition to these 40 units, 20 units of electives are needed to complete the degree. These electives are chosen in consultation with a faculty adviser and may include technical courses from other Berkeley departments. Selection of elective courses allows students to tailor the forestry major to their areas of special interest.

Summer Employment. Students are encouraged to further their professional training by taking summer positions in forestry, wildlife, or range management.

Minor in Forestry. A minor in forestry is available to any Berkeley student in good academic standing. Requirements are completion of a minimum of five courses related to forestry totaling a minimum of 12 units. At least one course must be taken on the Berkeley campus (i.e., not all can be summer field program courses). All courses must be taken for a letter grade and must average a minimum 2.0 grade point overall. Students who are interested must go to the department and obtain the requirements before starting the minor. A student will be awarded the minor following satisfactory completion and certification from the department.

Major in Molecular Environmental Biology

Chief Adviser: Mark Tanouye

The molecular environmental biology (MEB) major is designed to expose students to the organization 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 students interested in how organisms function in their environment. Consequently, students 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 to make relevant decisions in an effort to address these challenges.

The major in resource management provides the academic preparation and skill development appropriate to students desiring a career in the field of renewable natural resource management. It also serves as an undergraduate preparation for graduate study in fields such as resource management, range management, forestry, recreation management, and environmental economics. It provides an excellent background for graduate study in professional fields such as law or business administration.

This major is distinguished from the forestry major by its broad focus on the management of renewable natural resources and by the flexibility of its curriculum.

Preparatory Program. The preparatory program requires two years (60 semester units) of college work designed to provide a solid foundation in natural and social sciences and an adequate command of composition and speech.

Summer Field Program. An eight-week program of study for 10 units of credit is intended to introduce the student to wildland resource management. Ecology, identification and measurement of resources, policy, and the social dynamics involved in resource management are the focus of the summer field program.

Upper Division Course Work. Eight units of core requirements are taken in the final two years of the program. In addition to these 8 units, students select 21-24 units of upper division electives according to the option they choose in the major. These options are wildlife management, grassland and woodland management, forest and watershed management, and natural resource management. There are 28-31 units of free electives that may be taken in any subject. For example, the free electives may be used to gain more technical knowledge in the chosen option, or to broaden one's background with the wide array of courses available at Berkeley.

Graduate Programs

Graduate Student Services: 133 Mulford Hall, (510) 642-6410

Graduate Advisers: Nicholas J. Mills, Chair; Ronald G. Amundson, Dennis D. Baldocci, Tracy L. Benning, Gregory S. Biging, Sally K. Fairfax, Allen Goldman, Kevin L. O’Hara, Ye Qi, George Rodenick, John Battles.

The Department of Environmental Science, Policy, and Management (ESPM) offers both the M.S. and Ph.D. degrees in environmental science, policy, and management. The degree programs address current and future anthropogenic environmental problems of major social and political impact, which are based in the biological and physical sciences. Two general kinds of education are needed to produce people qualified to address these problems: 1) broadly based interdisciplinary education, and 2) disciplinary education in relevant fields supple-mented with exposure to cross-disciplinary communication 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 environmental science. Our program integrates the biological, social, and physical sciences to provide advanced education in basic and applied environmental sciences, decision analytical abilities, and fosters the capacity to conduct research into the structure and function of ecosystems at molecular through ecosystem scales and their inter-related human social systems.

The goal of the program is to provide both a strong disciplinary education and broad-based experience in cross-disciplinary communication and problem solving. In order to achieve this, the program leading to the M.S. and Ph.D. in environmental science, policy, and management will require that a student complete three core courses, and course work in the following four broad areas: disciplinary emphasis, area of specialization, research methods, and breadth requirement. The graduate adviser and a guiding committee, chosen by the student and approved by the graduate adviser, 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 interdisciplinary 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 the four fields of emphasis defined below. Specific course work within each field will be chosen by the guiding committee in conjunction with the student and approved by the graduate adviser. The four fields provide flexibility within a clear program structure.

a. Disciplinary Emphasis

The disciplinary emphasis is the broadest academic area encompassing the student’s interests. Currently the four disciplinary emphases within the department are Ecosystem Science, Forest Science, Insect Biology, and Resource Institutions, Policy, and Management. A student pursuing a strongly interdisciplinary program may study more than one of these disciplines in depth.

Ecosystem Science. Terrestrial ecosystems is a dynamic area of intellectual inquiry that is fundamental to our very concept of nature. Graduate students in the Division of Ecosystem Science are concerned with quantitative understanding of ecosystem properties and processes and the controls on these features. Central to this mission is a full partnership between physical and biological scientists, leading to an integrated understanding of ecosystem structure and function and the extension of these findings in modeling and implementation activities. The multidisciplinary faculty of Ecosystem Science conduct vigorous research related to the following important ecosystem components: soils, water, atmosphere, plants, fungi, and animals. The scales of interest, both temporal and spatial, vary greatly among the faculty, leading to a rich academic setting for graduate students interested in Earth surface properties and processes.

Forest Science. The Division of Forest Science seeks to promote excellence in education, research, and outreach programs in the social values and practice of forestry. These programs range from tree biology to forest ecology, and from forest biomes to the management of forests for the variety of goods and services. Research conducted by faculty and graduate students in the division ranges from studies at the organism to ecosystem levels, and from management issues concerning small private land owners to industrial holdings to public forests.
Insect Biology. Insects are one of the most successful groups of living organisms and play key roles in almost all natural resource systems. They play critical roles in the long-term maintenance of biodiversity and natural pest control, and are excellent model organisms for environmental research. The mission of insect biology is to use fundamental research on insect systems to address critical environmental issues and to solve vital environmental problems. Research interests in insect biology are wide-ranging, from the molecular level to whole ecosystems, providing a strong integration of biological processes and a diversity of intellectual challenges for graduate students. Systematics and biodiversity, behavior and neurobiology, and ecology and pest control are notable strengths in insect biology. Other research emphases include environmental toxicology, medical entomology, and insect-microbe interactions.

Resource Institutions, Policy, and Management. Faculty and students of the Division of Resource Institutions, Policy, and Management study how social distributions of power and resources affect environmental dynamics and their social consequences. Research and teaching focus (1) on how cultural, social, political, and economic institutions affect the treatment of natural resources and their interactions with environmental phenomena, and (2) on the practical processes, methods, and implications of forming, choosing, and applying policy in the interdependencies of social and environmental systems. The guiding principle of this departmental emphasis is the disciplinary integration of causes and consequences. 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. Current topics of interest include, global environmental change and international agreements; resource-dependent communities, regions, and industries; conservation of natural and local development; property, jurisdiction, and sovereignty; environmental equity; decision models and methods in ecosystem management; policies for land, water, forest, coastal, and wetlands resources; water and river basin regimes; environmental history and ethics.

b. Area of Specialization

The area of specialization is a narrower field within the disciplinary emphasis. Some examples of these areas might be microbial community ecology, ecosystem function, American environmental history, professional forest resource management, biogeochemistry, Mediterranean grassland ecosystems, remote sensing, and forest management.

c. 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, estimation, and hypothesis testing.

d. Breadth Requirement

Each student’s program must include course work addressing the interrelationships of ecosystem processes and the relationship between them. All students must complete the required core courses, ESPM 200A–200B–200C. In addition, while in residence, 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. The course must be at a minimum of 2 graduate division or 3 upper division undergraduate units, and must be taken for a letter grade unless it is offered on and S/U or P/NP basis only.

Required Core Courses

Each doctoral student in ESPM will be required to take three core courses. The first required course, ESPM 200A, Research Concepts and Methods (3 units), will be taken in the first semester. ESPM 200B, Case Studies in Environmental Science, Policy, and Management (3 units), will be taken in the second semester. Students must also enroll in ESPM 200C, the doctoral oral qualifying exam program. Students must prepare their oral analyses each week based on the research presented. ESPM 200C may be repeated for credit. Doctoral students must present their dissertation seminar and pass the final meeting of ESPM 200C before graduation. Students will also be required to complete a minimum of 6 units in an area of specialization. In addition, students in natural sciences must complete one additional course in the application of social sciences to environmental problems, and those in social sciences must complete one additional course in the biological or physical sciences. The guiding committee and the head graduate adviser 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 completion of the undergraduate program should normally be in a field relevant to the disciplinary emphasis chosen. Applicants without this background may be admitted to the program, but the student’s course work must compensate for deficiencies in their preparation. Prospective applicants are advised to consult with faculty or the Graduate School Student Services Office for course requirements.

It is critical that all applicants identify on their application faculty whose research and work overlap with their strengths and interests. 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, but it is not required. Faculty sponsorship of 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.

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, controlled environment chambers, greenhouse space, and field plots at the Oxford Tract (on campus). Field facilities available to departmental faculty and students include the 3500 acre Blodgett Forest; Whittaker’s Forest with giant sequoia stands adjacent to King’s 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 department also houses an outstanding entomological museum that supports both teaching and research programs in insect systematics and ecology.

Master of Forestry (M.F.)

Graduate Adviser: Kevin L. O’Hara

The Master of Forestry degree is the advanced professional degree offered by the Department of Environmental Science, Policy, and Management. The student who has completed an undergraduate curriculum in forestry is usually broadly trained in the principles of forestry but has not yet developed proficiency in the application of these principles to diverse forestry problems involved in professional practice. The Master of Forestry program is designed to advance the student’s understanding of the essentials of professional forest management at the graduate level within the context of resource and environmental planning of sustainable systems.

The M.F. program consists of three components: course work, an internship, and a professional paper. The course work consists of 24 semester units of course work and graduate courses of which at least 12 units must be at the graduate level. This program of study must be approved by the graduate adviser and guiding professor as constituting appropriate advanced specialized training in professional forest resource management. The internship, normally with a public or private forest land management organization, provides direct experience in the application of these principles to professional land management. The purpose of the professional paper is to demonstrate, within a distinct framework, the student’s ability to design and analyze data and to recommend a resolution of an applied forest problem. The paper may be based on the internship or on another supervised professional work experience, or may be a report based on independent analysis. The analysis must be completed within one semester and must, in all cases, be approved and accepted by the guiding professor and graduate adviser.

Upon completion of the program of course work, and approval of the professional paper, the student will take a comprehensive oral examination covering the field of forest management. Although major emphasis will be placed on work done in the professional forest resource management, the student is also expected to have a broad background in general science and economics to have a comprehensive understanding of the natural resources of the wildland environment.

Interdepartmental Graduate Group in Range Management (M.S.)

For information about the M.S. degree in range management, see the Range Management section of this catalog. Additional information about the graduate programs offered by the Department of Environmental Science, Policy, and Management may be obtained from the Graduate Student Services Office, 133 Mulford Hall, (510) 642-6410; fax: (510) 642-4034; e-mail: espmgradproginfo@na-ture.berkeley.edu.

Lower Division Courses

Basic Environmental Topics

2. The Biosphere. (3) Three hours of lecture and one hour of discussion per week. An introduction to the unifying principles and fundamental concepts underlying our scientific understanding of the biosphere. Topics covered include the physical support system on earth; nutrient cycles and factors regulating the chemical composition of water, air, and soil; the architecture and physiology of life; population biology and community ecology; human dependence on the biosphere; and the magnitude and consequences of human interventions in the biosphere. (F) Goldstein, Allen-Diaz

4. Environmental Chemistry. (2,3) Students will receive 2 units of credit for 4 after taking Chemistry 1A or equivalent. Two hours of lecture per week; additional two-hour discussion for students enrolling for 3 units. Physical and chemical properties of the environment; how they relate to pollution and environmental degradation. Students with weak backgrounds in chemistry should enroll in the Newman section.

6. Environmental Biology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: One course in introductory college biology is recommended. Intended for nonscience majors. Basic biology topics and environmental impact on the relation to environmental disruptions. Human interactions with the 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. (F) Chapela

6L. Environmental Biology Laboratory. (3) One hour of lecture and two hours of laboratory per week plus six field trips, which are outdoors. Laboratory and field course in ecology to acquaint students with the flora and fauna of several diverse ecosystems in California and the human influence involved in the disruption of biological systems. Students will develop techniques for taking effective field notes, will learn methods for sampling plants and animals in aquatic and terrestrial systems, and will learn statistical methods of analyzing the data gathered in experiments. Must prepare reports on each of the studies. (F) Dahlsten

Environmental Issues

10. Environmental Issues. (4) 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. (SP) Welter

10L. Environmental Issues: Special Projects. (1) Course may be repeated for credit. One and one-half hours of laboratory per week. Prerequisites: 10 (to be taken concurrently) or consent of instructor. Group projects related to environmental issues, led by students. (F-SP) Staff

11. Forest and Wildland Resource Conservation. (2) Two hours of lecture and one hour of discussion per week. Emphasis on building quantitative understanding of environmental issues and environmental citizenship. Also introduces students to the basic intellectual tools of environmental science; investigates ways the human ecological systems interact with the flora and fauna of several diverse ecosystems. Includes regeneration, controlling stand density, forest growth, genetics and tree improvement, and prescribed burning. (F) Mills, Gutierrez

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 introduction to how culture affects the way we use and manage fire, wildland and urban forests, rangelands, parks and preserves, and croplands in America. The basic concepts and tools for evaluating the role of culture in resource use and management are introduced and used to examine the experience of American cultural groups in the development and management of western natural resources. This course satisfies the American cultures requirement. (F) Hustinger

60. Environmental Policy, Administration, and Law. (4) Three hours of lecture and one hour of discussion per week. Formerly 151. Introduction to U.S. environmental policy process focuses on history and evolution of political institutions, importance of property, federal and state roles in decision making, and challenges of environmental policy. Emphasis is on use of science in decision making, choices between regulations and incentives, and role of bureaucracy in resource policy. Case studies of land use, environmental assessment, risk management, environmental regulation, and environmental justice. (SP) Fairtax

70. Forestry Computer Programming and Applications. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: High school algebra. Introduction to computer operating systems, programming, and applications software in natural resources. Includes the BASIC programming language and computer exercises drawn from forestry applications. (F) Staff

Environmental Sciences

20. Soils and Their Significance to Society. (3) Three hours of lecture per week. Introduction to soils; their properties, classification, distribution, and significance to society. Case studies of soil and landscape characteristics in relation to land use, and repressions of land misuse. (F) Gersper

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. Sections 5-8 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, and topics may vary from department to department and semester to semester. Enrollment limited to fifteen freshmen. (F-SP) Staff

39. Freshman/Sophomore Seminar. (1-3) Course may be repeated for credit as topic varies. One hour of seminar per week per unit. Sections 1-4 to be graded on a letter grade basis. Sections 5-8 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. The seminars are offered in all campus departments; topics vary from department to department and from semester to semester. (F-SP)

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 environments. The course examines the wonder of insects, their interactions with the living world, and their contributions to and impacts on human society. (F) Purcell

42. Natural History of Insects. (2) Two hours of lecture per week. An outline of the main facts and principles of biology for insect appetizers, with special emphasis on their relationships to plants and animals, including humans. (SP) Gillespie, Rodenick

44. Biological Control. (2) Two hours of lecture per week. Regulation of populations of organisms, especially insects, through interactions with parasites, predation, pathogens, competitors. Discussion of examples from agricultural, forest, urban, and recreational environments. (F) Mills, Gutierrez

Special Topics and Independent Study

90. Introduction to Conservation and Resource Studies Majors. (1) One hour of discussion per week. Must be taken on a passed/not passed basis. Introduction to the major, emphasizing each student's educational goals. Overview of ecological problems and contrasting approaches to solutions through institutional and community-based efforts. Required of all CRS sophomore majors and all entering off-campus transfer students to CRS major. Restricted to CRS majors. One field trip is normally required. (F,SP) Huisman, Franke

98. Directed Group Study in ESPM. (1-3) Course may be repeated for credit. One hour of lecture/discussion per week. (SP) 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: Lower division standing; consent of instructor, adviser, and department chair. Study of special topics that are not covered in depth by other courses. Open to students in good standing who, in consultation with a faculty sponsor, present a proposal with clearly formulated objectives and means of implementation. Intended for exceptional students. (F,SP) Staff

Upper Division Courses

100. Environmental Problem Solving. (4) Three hours of lecture and one and one-half hours of discussion/demonstration per week. Prerequisites: One course in ecology; one course in mathematics or statistics; one course in a social science or economics. Analysis of contrasting approaches to understanding and solving environmental and resource management problems. Case studies and assignments that integrate concepts, principles, and practices from physical, biological, social, and economic disciplines. Their use in environmental policies and resource and management plans. (F) Frankie, Milton

101. Field Study of Forestry and Wildland Resources. Courses 101A-101E comprise a field study program in Forestry and Wildland Resources. Ex-trassession.

101B. Silviculture. (4) Forty hours of lecture/field exercises per week for one week. Prerequisites: 101A. Evaluation of systems for managing forest stands including regeneration, controlling stand density, forest growth, genetics and tree improvement, and prescribed burning. Staff

101C. Forest Measurements, Aerial Photography, and Surveying. (2) Forty hours of lecture per week for one week. Prerequisites: 101B. Procedures for measuring the forest resources, introduction to land surveying, aerial photography, timber inventories, and measurement of trees and forest growth. Staff

101D. Timber Resource Utilization. (4) Forty hours of lecture and exercises per week for one week. Prerequisites: 101C. Harvesting and access systems, wood quality, and manufacture of forest products. Visits to industrial operations to evaluate land management practices and utilization operations. Staff

102A. Terrestrial Resource Ecology. (4) Three hours of lecture and four hours of laboratory per week. Prerequisites: Biology 1A-1B or equivalent. Provides a foundation in terrestrial ecology. Organized around five topics: environmental biophysiology, ecosystem carbon balance, ecophysiology, population ecology, community ecology. Examines how each contributes to understanding of distribution and abundance of organisms in the environment. Includes a mandatory weekend field trip, and a group research project provide opportunities to explore questions in depth. Emphasis on building quantitative understanding of ecological phenomena. (F) Bartolome, Bates

102B. Resource Assessment. (4) Three hours of lecture and four hours of laboratory per week. Prerequisites: Junior standing; 70 or computer programming course. An introduction to environmental assessment techniques in renewable resource sciences. Information gathering and analytic techniques to provide a reliable basis for answering scientific and policy questions about the effects of management and conservation on terrestrial ecosystems. Information on available computer software. (F) Staff

102C. Resource Management. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Precalculus, 156, 184, and 70 are recommended. Presents concept and practical approaches to public and private natural resource management decision making. The focus is on goals, criteria, data, models, and technology for quantifying and communicating the consequences of planning options. A range of contemporary approaches to management is presented, including wildland, forest, social, economic, and ecosystem management problems is addressed. (SP) Gilliss

102D. Resource and Environmental Policy. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 50AC, 60, Environmental Economics and Policy 1, equivalents. (F) or consent of instructor. The course develops capacities to analyze
and affect the cause, dynamics, and consequences of resources and environmental policy formation and ex- ecut. It develops concepts of public policy and how they are understood, analyzed, and negotiated in economic, and administrative processes form, execute, and modify it. It analyzes public policy formation and execution. It examines re- source and environmental consequences of national macroeconomic and international arrangements, and de- velops an ability to maintain a professional stance in severe contested values. Oral presentation skills are developed. (SP) Romm

C103. Principles of Conservation Biology. (3) Two hours of lecture and one and one-half hours of discussion per week. Prerequisites: Biology 1A-1B or equivalent. Survey of the principles and practices of conservation biology. Factors that affect the creation, protection, and preservation of biodiversity are discussed. Student level of the gene, species, and ecosystem are examined. Tools and management options derived from ecology and evolutionary biology that can recover or preserve the loss of biologic diversity are explored. Also listed as Integrative Biology C156. (F, S) Staff

C104. Modeling and Management of Biological Re- sources. (4) Three hours of lecture per week and ad- hoc microcomputer laboratory meetings. Prerequisites: Two semesters of calculus and consent of instructor. Modeling strategies for growth, chaos, life tables, and Leslie matrix theory. Harvesting and exploitation the- ory. Methods for analyzing population interactions, predation, competition. Fisheries, forest stands, and in- sects. Genetic aspects of population management. Mathematical theory based on 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. (SP) Getz

Biology and Conservation

105A. Conservation Biology. (4) Three hours of lec- ture and two hours of discussion per week. Prerequisites: Biology 1A-1B or equivalent. A comparative look at the growth, chaos, life tables, and Leslie matrix theory. Interactions between plants and animals, feeding preferences, and disease management, and food preservation. Lab- oratories include methods in garden design, plant prop- agation, compost techniques, soil management, pest management, individual or group pro- jects, demonstrations, and discussions. Enrollment may be limited. (F) Huisman

105L. Conservation Biology Laboratory. (1) Two hours of lab per week. Prerequisites: Consent of instructor. Provides laboratory experience in the development of ecosystem models, and the analysis of the complex interactions and feedbacks that govern ecosystem productivity and stability. Students will develop models that simulate the functioning of real ecosystems and then compare their results to data collected from real ecosystems. (SP) Silver

106. American Wildlife: Identification and Con- servation. (3) One hour of lecture and three hours of laboratory per week, plus four Saturday field trips. Prerequisites: One course in ecology and introduction to biological sciences. Study of American wildlife and its conservation through the identification of species, their habitats, and the major threats to their populations. Students will also have the opportunity to participate in a field study of a local ecosystem. (SP) Spieh

105C. Genetic Diversity and Conservation. (3) Kuyt

106. American Wildlife: Identification and Con- servation. (3) One hour of lecture and three hours of laboratory per week, plus four Saturday field trips. Prerequisites: 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. (SP) Barret

107. Biology and Geomorphology of Tropical Is- lands. (3) Nine hours of lecture for 6 weeks, three hours of lecture for 3 weeks. Natural history and evolutionary biology of island terrestrial and freshwater organisms, and of mar- ine organisms in their coral reef and lagoon systems. Study of an island of Moorea (French Polynesia). Also listed as Geog- raphy C142 and Integrative Biology C158.

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 in the region. Includes identification of species, field identification of individual trees, and examination of growth forms. (SP) Dodd

108B. Forest Genetics. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B or equivalent. A survey of the principles and practices of conservation biology. Factors that affect the creation, protection, and preservation of biodiversity are discussed. Student level of the gene, species, and ecosystem are examined. Tools and management options derived from ecology and evolutionary biology that can recover or preserve the loss of biologic diversity are explored. Also listed as Integrative Biology C156. (F) Staff

109. Range Plants. (3) Two hours of lecture and three hours of laboratory per week. Systematic rela- tionships and identification of range grasses, forbs, and shrubs; their distribution, growth, forage values, and re- sponses to use. (SP) Bartolome

110. Primate Ecology. (4) Three hours of lecture 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 contrasting primate regions of the world and examine the impact of selective logging on primate densities and diversities in each area. Mil- ton

112. Microbial Ecology. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Bi- ology 1A or equivalent. An introduction to the ecology of microorganisms. Topics include interrelationships of microorganisms and their environment; the role of bacteria, actinomycetes, al- gae, protozoa, and fungi in cycling of the elements, in macroecology, their taxonomy, ecology, physical, chem- ical, and biological properties of terrestrial, aquatic, and organismal habitats; population dynamics. Enrollment is limited. (SP) Huisman

113. Insect Ecology. (2) Two hours of lecture per week. Prerequisites: Biology 1B or consent of in- structor. Ecology of insects with the physical environment; structure and functioning of insect populations and communities; behavioral ecology of predator-prey interactions; plant-insect interactions; so- cial insects; pollination 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 level- es of organization, followed by selected case studies. (F) McCullough

115B. Biology of Aquatic Insects. (3) Two hours of lecture and three hours of laboratory per week. Prerequi- sites: Introduction to biological sciences. Introduction to identification and ecology of aquatic insects, including their role as indicators of environmental quality. Offered odd-numbered years. (F) Rush

116A. Forest Ecology. (4) Three hours of lecture and four hours of laboratory per week. Field trips. Prerequisites: 101A, 8 units of bi- ological science, and 8 units of chemistry. The ecol- ogy of forests from the perspectives of ecosystem analysis, physiological ecology, and vegetation dynamics. Major emphasis on the understanding of forest ecosystems. Student laboratories will illustrate ecological principles and techniques for the assessment of forest ecosystems. (F) McBride

116B. Range Ecology, Improvements, and Man- agement. (3) Three hours of lecture per week. Pre- requisites: One course in ecology. The ecological ba- sis for range management activities, considered in the context of western range ecosystem types. Specific range improvement techniques and 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. Prerequisites: One course in ecology and one course in chemical discipline. Introduction to the ecology of terrestrial tropical ecosys- tems, with particular emphasis on neotropical forests. Explores unique aspects of tropical ecosystems, es- pecially nutrient cycles, primary productivity, bio- logical diversity, forest structure and dynamics, dis- turbance ecology, and the natural history of key forest organisms. Basic ecology is integrated with discussion of human disturbances of tropical ecosys- tems, and the global importance of tropical forests. (SP) Silver

117. Urban Garden Ecosystems. (3) Three hours of lecture and three hours of laboratory per week. An ecosystem approach to the study of urban gardens with an emphasis on the functional relationships between plants and animals. Teaching preferences, animal phenology, and defense substances, bio- chemical interactions between higher plants, and phy- totoxins and phytotoxins. (F) Kubo

Soil, Water, Atmosphere

120. Soil Characteristics. (3) Three hours of lecture per week. Prerequisites: Chemistry 1A, 3A. Introduc- tion to physical, engineering, chemical, and biological properties of soil; methods of soil identi- fication, geographic distribution and 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 Sat- urday field trip. (F) McColl

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 soil profiles; the influence of envi- ronmental factors, and time. Soils as functioning parts of ecosystems; use of soils in archeological and pa- leoclimatic studies; anthropogenic effects on soil ecosystems. (SP) Amundson

122. Field Study of Soil Development. (1) Five day- long Saturday field trips to locations in central Cali- fornia. The field study of soil development and mor- phology. Methods of soil morphological descriptions; study of factors affecting soil formation; rela- tionship of soil morphology to land use; quaternary ge- ology of central California; use of soils in dating land- scapes. (SP) Amundson

123. Summer Field Course. (4) Four 8-hour days of lecture and a month of rigorous field study. Prerequi- sites: 120, 121, or consent of instructor. An intensive study of soils of California. Field days consist of de-
Math 16.

124. The Soil As a Medium for Plant Growth, (3) Three hours of lecture per week. Prerequisites: Chemistry 1A, 2A, and Math 1A or equivalent. Emphasis on understanding the relationship of soil properties to vegetation and climate. Discussion of factors affecting suitability of soils for various land uses included. The final week consists of report preparation and final exam. Extra-sec.

Amundson

125. Soil Physics. (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: 120 and Math 18. Physical characterization of soils; soil water potentials; transport of water, gases, and heat in soil. Offered odd-numbered years. (SP) Firestone, Silver

126. Environmental Soil Chemistry. (3) Three hours of lecture per week. Prerequisites: Chemistry 1A, 3A, and Math 16A or equivalent. Recommended: 120, 121 or EPS 5A or equivalent. Emphasis on the environmental chemistry of soil-soluble and soil-resident compounds; reaction mechanisms; and energetic aspects of soil chemistry. The course emphasizes laboratory exercises. (SP) Ghodratii

127. Terrestrial Ecosystem Analysis: Below Ground Processes. (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: 120 or consent of instructor. This course emphasizes laboratory and field analysis of soil processes. Topics include chemical, physical, and biological processes of soil and their applications presented through lectures and workshops. During the last part of the course, students will develop and complete independent projects using a combination of techniques presented to the class. This course is directed to students wishing to gain hands-on experience in understanding soil processes, analyzing and quantifying their observations, and undertaking research that links soil processes to a specific problem. (SP) Doner, Firestone, Ghodratii

128. Biometeorology. (3) Three hours of lecture per week. Prerequisites: Math 16A or equivalent, and Physics 8A or consent of instructor. 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 physical, biological, and chemical processes such as photosynthesis, respiration, evaporation, and material (water, CO2, atmospheric trace gases) between vegetation and the atmosphere. Plant biometeorology instrumentation and measurements are also discussed. (F) Baldocchi

C129. Biometeorology. (3) Three hours of lecture per week. Prerequisites: Mathematics 16A or equivalent, Physics 10, or consent of instructor. 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 physical, biological, and chemical processes such as photosynthesis, respiration, evaporation, and material (water, CO2, atmospheric trace gases) between vegetation and the atmosphere. Plant biometeorology instrumentation and measurements are also discussed. (F) Baldocchi

Environmental Microbiology


131. Soil Microbiology. (2) Two hours of lecture per week. Prerequisites: Biology 1A-1B. Introduction to soil microorganisms; diversity, ecology, and activity in relation to biogeochemical cycles; soil chemical, and soil organic matter. Offered odd-numbered years. (SP) Firestone

134. Fire, Insects, and Diseases in Forest Ecosystems. (3) Three hours of lecture per week and four one-to-two-day field trips. Prerequisites: One course in biological sciences beyond introductory biology (1A-1B or equivalent), and consent of instructor. Discussion of the fire insect and disease interaction in California forests. Topics include fire behavior and plant-insect interactions. Collection and evaluation of data. (F) Williams, Gillespie

135. Biological Control of Pests. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 140 and 142, or consent of instructor. Study of various host-parasite, predator-prey, and mutualistic interactions, especially those of significance to agriculture, forestry, urban, and recreational environments. Implementation of biological control methods involving importation, augmentation, and conservation of natural enemies. Offered odd-numbered years. (F) Mills

136. Forest Health. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: 101A-101B, 185, junior standing, and consent of instructor. Examine the biology and ecology of forest insects and pathogens; their impacts on forest ecosystems, and their interactions with other disturbances. Explore forest health concepts in terms of the frequencies and severities of these disturbances from utilitarian and ecosystem perspectives. (SP) Williams

C138. Introduction to Comparative Virology. (4) Three hours of lecture per week. Prerequisites: Introductory chemistry (1A or 3A-3B or equivalent) and introductory biology (1A-B or equivalent) and general biochemistry (100 or equivalent)—preferably completed but may be taken concurrently. Viruses will be considered as infectious agents of bacteria, plants, and animals (vertebrates and invertebrates). Several families of viruses will be compared with respect to biochemical, structural and morphological properties, and strategies of infection and replication. Also listed as Plant Biology C114 and Molecular and Cell Biology C114. (SP) Volkman, Jackson

Entomology

140. General Entomology. (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: Introductory course in a biological science. Biology of insects. Study of insects and their role in the environment. Insects in relation to their surroundings. (SP) Purcell, Rodenick

142. Principles of Systematic Zoology. (2) One hour of lecture and three hours of discussion/laboratory per week. Prerequisites: 141 and 142, or consent of instructor. Principles and methods of animal taxonomy and phylogeny: history, concepts of species and other taxa, methods of classification, bibliographic procedures, nomenclature and museum practices, with emphasis on examples in insects. (F) Gillespie

144. Insect Physiology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: General biology, zoology, or anti-matter. A survey of the unique physiological mechanisms of insects, including the analysis of physiological systems at the cellular level. (SP) Tanouye

145. Arthropod-Borne Zoonotic Diseases: Basic Principles and Methods of Study. (2) Two 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 to humans 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 for study; and examination of arthropod and vertebrate tissues for pathogens. Offered even-numbered years. (SP) Lane

146L. Medical/Veterinary Entomology. Laboratory. (1) Three hours of laboratory per week. Laboratory identification of the major arthropod vectors of disease agents to humans and other animals, and study of the structural adaptations and behavior of living and parasitic stages and with blood feeding. Offered odd-numbered years. (SP) Lane

147. Field Entomology. (1) Course may be repeated for credit up to four times. One week involving 60 hours of laboratory work and one hour of lecture. Offered four times per year. Prerequisites: 42, 140, or consent of instructor. Field observation, recording and interpretation of insect relationships to habitats, their behavior and plant-insect interactions. Collection and preparation of specimens with important biological data. (F,SP) Staff

148. 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. Offered odd-numbered years. (SP) Casida

Environmental Policy and Law

153. American Land - Interpretation, Use, and Control. (4) Three hours of lecture and one hour of discussion per week, plus two field trips. Prerequisites: 60, Political Science 1, or consent of instructor. Explores the relationship to land, the evolution of land's physical and biological features, and American ideas of what land means and how it should be used. Compares the formal and informal methods that direct use of land, including governmental and non-governmental regulations; decision-making; public land uses; and private land development. (F) Fairchild

154. Environmental Analysis. (4) Three hours of lecture, one hour of discussion, and two hour project group per week. Prerequisites: 151 (formerly Conservation and Resource Studies 130) or consent of instructor. Methodologies for describing and assessing human-induced changes on environmental systems. Provides skills in the collection and evaluation of data.
Natural Resource Sociology and Economics

155. Sociology of Natural Resources. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Sociology 100 or consent of instructor. Expository and critical examination of 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 per week plus two hours of voluntary discussion every other 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 Sciences 1519. (SP) Miltor

C160. American Environmental and Cultural History. (4) Three hours of lecture and one and one-half hours of discussion per week. Formerly 160AC. History of the American environment and the ways in which different cultures have perceived, used, managed, and conserved it from colonial times to the present. Cultures include American Indians and European 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 C120. This course satisfies the American cultures requirement. (F) Merchant

Environmental History, Philosophy, and Ethics

160AC. American Environmental and Cultural History. (4) Three hours of lecture and one and one-half hours of discussion per week. Formerly 160AC. History of the American environment and the ways in which different cultures have perceived, used, managed, and conserved it from colonial times to the present. Cultures include American Indians and European 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. 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 the role of ideologies, beliefs, attitudes, and behavior. An examination of contemporary environmental literature and the philosophies embodied therein. Open to non-environmental majors. (F) Staff

162. Bioethics. (3) Two hours of lecture and one hour of discussion per week. Exploration of the ethical dilemmas arising from recent advances in the biological sciences: genetics, engineering, socio-biology, health care delivery, behavior modification, patients' rights, and control of research. (SP) Staff

164. Ecosystemology. (3) Three hours of lecture and one and one-half hours of discussion per week. Pre-requisites: 100 or any ecology course or consent of instructor. Conceptual tools for studying large, complex ecosystems. Concepts and methods are dependent components of planning agents, indifferent observers; how to deal with complexity; the systems approach to problem solving; determining systems boundaries; ecological concepts; ecosystem management. A weekend field trip is required. (SP) Staff

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. (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 analysis of the historical transformation of indigenous peoples and their environments in North America and the Third World. The origins and specific patterns of socio-economic problems in these areas, existing and alternative future development policies and their effects. (SP) Carr

167. Environmental Health and Development. (3) Three hours of lecture per week. Impact of environmental alterations resulting from development programs and other human activities which affect the health of people in developed and less developed parts of the world. Case studies and mitigation measures of diseases associated with water storage utilization. (F) Staff

168. Political Ecology. (3) Three hours of lecture per week. Analysis of ecological problems in the U.S. from the standpoint of their roots in contemporary political and economic systems and their potential solutions within the present political system. Special emphasis on U.S. policy regarding energy and agricultural development, considered within the global context. (SP) Peluso

Resource Assessment and Evaluation

171. Forest and Wildland Resource Inventory. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 70, 156, and Statistics 20 or equivalent; Math 164A-164B recommended. Statistical and practical concepts presented to introduce concepts of forest and wildland resource inventory systems. Statistical designs include random, stratified, double and two-stage sampling as well as basic methods of regression estimation. Applications include timber sale; compartment, forest, and rangeland stocking estimates, as well as estimates of change or growth. (SP) Staff

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 an important data collection and analysis tool for natural resource management in spatial sciences such as ecology, geography, geology, civil engineering, and environmental design. Photo measures of scale, area, and object height, time planning, an introduction to the electromagnetic spectrum, photo interpretation and mapping, digital remote sensing, and data management in geographic information systems. (SP) Gong

173. Characteristics and Utilization of Woody Biomass. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Consent of instructor. Past, current, and emerging issues and approaches to the use of woody biomass; conversion to useful wood products; performance of materials in use; substitutions and hybrid materials. (SP) Beall

176. Performance of Wood in Structures. (3) Three hours of lecture. Formerly Architecture 153. The survey of wood properties and wood products of importance to building design and construction. Emphasis is placed on prevention of biodeterioration. Case studies will be presented to avoid wood failure in structures, showing proper use of wood products. (F) Beall

Resource Management

180. Atmospheric Chemistry. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 1A-1B and Physics 8A or equivalents, or consent of instructor. Processes controlling the chemical composition of the earth's atmosphere. Effects of human influence: stratospheric ozone depletion, increasing concentrations of greenhouse gases, changes in the oxidation capacity of the troposphere, smog. (F) Goldstein

181. Fire Science and Management in the Urban-Wildland Interface. (3) Three hours and three hours of laboratory per week. Prerequisites: Consent of instructor. Fundamentals of combustion, fuels, and fire behavior; fire weather; mitigation of structural fires; characteristics and use of fire models; fire hazard zoning; plant flammability; emissions. Laboratories on modeling, field surveys, instrumentation, and fire testing of vegetation and structures. (SP) Stephens

182. Forest Operations Management. (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. Special emphasis for understanding human interaction within forested environments includes the operational mesh of technical, financial, organizational, legal, and ecological factors. The worldwide range of stewardship activities includes access, product harvest, tree tending, regeneration, and protection. (F) Staff

183. Forest Planning and Management. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 70, 156, and 165. 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 forest analysis with GIS. Fundamentals of land-use planning, valuation, multiple goal decision analysis, and forest management scheduling. Quantitative, analytical, and communicative skills are emphasized. Oral presentation required. (SP) Qi

184. Agroforestry Systems. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Upper division standing. Agroforestry principles and systems in use worldwide are examined, with emphasis on contemporary temperate agroforestry system design and management. Economic, biologic, social, and political conditions for successful agroforestry systems are analyzed. Some laboratory sessions will be field trips that will extend beyond the scheduled lab time. (SP) Altiere

185. Multiple Resource Silviculture. (4) Three hours of lecture and four hours of laboratory per week. Prerequisites: 116A or course in community ecology. Concepts and applications of silviculture for the establishment, growth, composition, and quality of forest trees and stands. Silviculture is presented as a tool to meet multiple resource and ecosystem management objectives related to wildlife habitat, watershed resources, forest health, or timber production. Three Saturday field trips will be scheduled in lieu of several laboratory. (F) O'Hara

186. Management of Grassland and Woodlands. (4) Two hours of lecture and four hours of laboratory per week. Prerequisites: Biology course or consent of instructor. Application of plant and animal ecology to management of grassland, shrubland, and woodland ecosystems. Grazing dynamics and management options for conserving wildlife habitat. Case studies of the use of any one or a combination of ranching, recreation, wildlife habitat, watershed, and open space purposes. Laboratory includes experimental comparison of grassland species in replicated field trials. (F) Allen-Diaz, Bartolome, Huntsinger

187. Wildlife Conservation. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites:
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. (F,SP) 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 representations in paintings, photographs, and literary essays. This examination seeks to understand the American forest as a scientific and economic parameter, 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 American Studies C176, Undergrad Interdisciplinary Studies C136, and History of Art C189, Lovell, McBride

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. This course will equip students with an understanding of how modern molecular approaches, including recombinant DNA methods, can be used to recognize and solve problems in the area of conservation, habitat and end-user preferences for the use of forest-based materials, and environmental pollution. Students will also develop and present case studies of environmental problems solving using modern molecular methods. (F) Lindow

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 for all age levels and all facets of society, including schools. Concentrated experience in participatory education. Also listed as Education C193A. (F) 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 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. (SP) Hurst

194. Senior Seminar in Conservation and Resource Studies. (3) Three hours of seminar per week. Prerequisites: Senior standing in CRS major. Seminar in which students synthesize their knowledge, skills, and interests into a holistic perspective. A one-hour oral presentation on the basis of interest and a senior thesis synthesizing the area of interest are required. Required final semester for all CRS majors. (F,SP) Staff

195. Senior Thesis. (3-4) Students who have successfully completed 195 may petition for exemption from 194. Three hours of laboratory research work per week. Senior standing in CRS major: 3.0 GPA. Subject must be approved by faculty sponsor during fall semester of the senior year and course initiated in the first semester of the senior year. (F,SP) Staff

H196. 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 major requirement: research proposal. Students may not register for more than 300 words required for approval. (F,SP) Staff

196A. Internship in ESFM—Field Module. (3-8) Fifteen to ten hours per week at placement location for 10 weeks. Must be taken with consent of instructor. Prerequisites: Upper division standing; consent of adviser, faculty sponsor, and ESFM department; normally restricted to ESFM majors. Intern placement relevant to student's academic interests and career objectives. Must be approved early in preceding semester. See "Internship Guidelines," available in ESFM student services office. (F,SP) Staff

196B. Internship in ESFM—Research/ Seminar Module. (2-5) Two hours of seminar per week, variable hours of research per week. Prerequisites: Upper division standing in an ESFM major; 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 ESFM student services office. (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 per unit. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing. Campus and departmental restrictions apply. Supervised experience in a field study course specific to 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 that are not covered 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 Courses and Curricula section of this catalog for specific independent study and research specific to aspects of environmental science, policy, and management. (F,SP) Staff

Graduate Courses

200A. Case Studies in Environmental Science, Policy, and Management. (3) Three hours of lecture/semester per week. The application of science, policy analysis, and management to a series of specific case histories covering the array of issues representative of the Environmental Science, Policy, and Management program, including agricultural, urban, and wildland cases. 200A is the first semester of a three-semester core course sequence required for all Environmental Science, Policy, and Management graduate students. (F,SP) Staff

200B. Research Concepts and Methods. (3) Three hours of lecture/semester per week. Prerequisites: Basic course in statistics. Formerly 204. Conceptual and methodological bases of research design, data analysis, and interpretation. Case studies and individual projects critiqued. 200B is the second semester of a three-semester core course sequence required for all Environmental Science, Policy, and Management graduate students. (SP) Staff

200C. Environmental Forum. (1) Course may be repeated for credit. Two hours of seminar/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Presentation and analysis of current topics in environmental science, policy, and management. 200C is the third semester of a three-semester core course sequence required for all Environmental Science, Policy, and Management graduate students. (F,SP) Staff

C205. Quantitative Methods for Ecological and Environmental Modeling. (3) Three hours of lecture per week. 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 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 C211 and Energy and Resources Groups C205. (F) Staff

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 point patterns and Ripley's K function, 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) Three hours of lecture per week. Prerequisites: 102 or consent of instructor. Modeling methods in ecology and meteorology; stability analysis; effects of anthropogenic stress on natural systems. Alternatively. Also listed as Integrative Biology C271 and Energy and Resources Group C202. (SP) Powell

C212. Ecological and Social Dimensions of Global Change. (2) One and one-half hours of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Maximum enrollment 25. This course will explore the potential ecological and societal impacts of global change, focusing on ecological and economic tradeoffs associated with the following human responses to global change: adaptation, prevention, and no response. Emphasis is placed on developing predictive models of how the Earth System (including humans) will respond to global change. Also listed as Geography C244, Energy and Resources Group C291, and Integrative Biology C272.

213. Modeling of Population Processes. (2) Two hours of lecture/discussion per week. Prerequisites: Two semesters calculus, one semester ecology, and consent of instructor. Discussions center on the fundamentals of modeling population processes in ecology, evolution, and behavior. Concepts and techniques in the literature will be reviewed. Students will have an opportunity for hands-on experience with simulation software packages. Oral and written presentations will be required. Offered odd-numbered years. (F,SP) Getz

C220. Geochronological Approaches to Modern and Past Environments and Climates. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. Formerly 220. Research and graduate course on the use of geochronometric methods in modern and paleo environments and climates. (F,SP) Staff
221. Advanced Soil Chemistry. (2) Two hours of lectures per week. Prerequisites: 124A, Math 134A or equivalent. Trace element chemistry and adsorption mechanisms to soil materials, organic-mineral interactions, and application of chemical thermodynamics to soil systems. Offered odd-numbered years. (F) Doner

222. Surface and Colloid Chemistry of Natural Particles. (3) Three hours of lecture per week. Prerequisites: 126 or consent of instructor. Structure and coordination chemistry of natural adsorbent particles in aqueous systems; solute adsorption mechanisms and theoretical models; interparticle forces and colloidal phenomena; applications to biogeochemistry and contaminant hydrology. Offered even-numbered years. (SP) Sposito

223. Advanced Soil Microbiology and Biochemistry. (3) Three hours of lecture per week. Prerequisites: 131. Microbial processes and their role in soil nutrient transformations. The ecology of microbes in the soil environment. (F) Firestone

248A. Seminar in Forest Entomology. (1) Three hours of seminar per week. A 3-hour seminar held once a week for graduate students to discuss the advances in forest entomology through individually prepared presentations by students. (F) Dahlsten, Wood

Resource Policy

250. Environmental History, Philosophy, and Ethics. (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 literature in the field of environmental history, philosophy, and ethics, with special emphasis on the American environment. Topics will include environmental historiography, theories of environmental history, and the relationships between environmental history, philosophy, ethics, ecology, and policy. Offered odd-numbered years. (F) Merchant

251. International Conservation and Development Policy. (3) Three hours of lecture/discussion per week. Prerequisites: 113, Math 16A-16B, or consent of instructor. Seminar/discussion by graduate students of current research and applications related to international conservation and development. (SP) Carr

252. Seminar in Forest and Wildland Resource Policy Analysis. (1) One hour of seminar per week. Prerequisites: Consent of instructor. Seminar/discussion by graduate students of current research and search in the field of plant pathogenic bacteria. Offered even-numbered years. (F) Lindow

268. Seminar in Range Ecology. (2) Three hours of lecture and three hours of laboratory per week. Prerequisites: Geography 188 or Landscape Architecture 241. Initial sessions address the definition of political economy. Further sessions address (1) methods of policy analysis for wildland resources, estimated land use planning projects are to be arranged. Offered odd-numbered years. (SP) Staff

270. Advanced Forest Sampling. (2) Three hours of lecture per week. Prerequisites: 171, 174, or equivalent, or consent of instructor. Application of advanced sampling theory to the measurement of forest and wildland resources, estimated land use planning projects are to be arranged. Offered odd-numbered years. (F) Gong

271. Advanced Remote Sensing of Natural Resources. (3) Three hours of lecture/seminar per week. Prerequisites: 172. Statistics 20, or consent of instructor. Advanced photographic systems. Nonphotographic systems including terrestrial laser scanner, imaging spectrometry, thermal, and RADAR. 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

272. Advanced Forest Mensuration. (2) Two hours of lecture per week. Prerequisites: 101, 104, Statistics 20; Statistics 161 recommended. An overview of research concerning growth modelling of forest stands and trees. Statistical and mathematical forest modelling techniques. (F) Bijing

273. Ecosystem Management. (3) Three hours of lecture per week. Prerequisites: Basic ecology, microeconomics, and resource economics. Examines forest and wildland major issues and approaches in ecosystem management. Topics include development of the ecosystem approach, valuation of ecosystem commodities and services, assessment of ecosystem services, data source, data representation and data quality issues; project management. Offered even-numbered years. (F) Gong

274. Case Studies in Forest Management. (1-8) Course may be repeated for credit. One hour of lecture and three hours of laboratory per week. Prerequisites: Geography 188 or Landscape Architecture 188X or consent of instructor. Advanced course on spatial data acquisition, including remote sensing, GIS, design of geographic information systems through problem identification, conceptual design and functional specification; construction of GIS; system validation; applications in natural resource studies; data source, data representation and data quality issues; project management. Offered even-numbered years. (F) Gong

287. Seminar in Forest Economics and Management. (1) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Workshop format features current research of faculty and doctoral students investigating the application of economics, systems analysis, and environmental modeling techniques to the management of forest and wildland ecosystems. Organization of research presentations, the scientific publication process, and research funding issues will also be addressed. (F,SP) Gilles, Qin, McBratney

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. (SP) Benning

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. 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 seminar per week. Prerequisites: Consent of instructor. A seminar course dealing with selected topics in ecology of rangelands. (F) Hutsinger

270. Advanced Forest Sampling. (2) Two hours of lecture per week. Prerequisites: 171, 174, or equivalent, or consent of instructor. Application of advanced sampling theory to the measurement of forest and wildland resources, estimated land use planning projects are to be arranged. Offered odd-numbered years. (SP) Staff

271. Advanced Remote Sensing of Natural Resources. (3) Three hours of lecture/seminar per week. Prerequisites: 172. Statistics 20, or consent of instructor. Advanced photographic systems. Nonphotographic systems including terrestrial laser scanner, imaging spectrometry, thermal, and RADAR. 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

272. Advanced Forest Mensuration. (2) Two hours of lecture per week. Prerequisites: 101, 104, Statistics 20; Statistics 161 recommended. An overview of research concerning growth modelling of forest stands and trees. Statistical and mathematical forest modelling techniques. (F) Bijing

273. Ecosystem Management. (3) Three hours of lecture per week. Prerequisites: Basic ecology, microeconomics, and resource economics. Examines forest and wildland major issues and approaches in ecosystem management. Topics include development of the ecosystem approach, valuation of ecosystem commodities and services, assessment of ecosystem services, data source, data representation and data quality issues; project management. Offered even-numbered years. (F) Gong

274. Case Studies in Forest Management. (1-8) Course may be repeated for credit. One hour of lecture and three hours of laboratory per week. Prerequisites: Geography 188 or Landscape Architecture 188X or consent of instructor. Advanced course on spatial data acquisition, including remote sensing, GIS, design of geographic information systems through problem identification, conceptual design and functional specification; construction of GIS; system validation; applications in natural resource studies; data source, data representation and data quality issues; project management. Offered even-numbered years. (F) Gong

B prefix=language course for business majors C prefix=course cross-listed course H prefix=honors course R prefix=course satisfies R&C requirement AG suffix=course satisfies American cultures requirement *Professor of the Graduate School †Recipient of Distinguished Teaching Award
276. Advanced Silviculture. (2) Three hours of lecture per week. Prerequisites: 185 or equivalent. Analysis and evaluation of current literature and experience. Field trips may be included depending upon the topic. (SP) O’Hara

278. Range Assessment. (2) Three hours of lecture and three hours of laboratory per week. Prerequisites: 186 and one semester of statistics. Rangeland vegetation sampling units 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 plus four field trips. Prerequisites: Consent of instructor. A survey of pastoral animal management and production systems, as they influence and are influenced by the rangeland environment. View of the evolution of animal management practices; contemporary management 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) Hunttinger

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. (F) McCullough

283. Wildlife Management Planning. (3) Three hours of lecture per week. Prerequisites: 187 or equivalent. A review of the latest methodologies for developing wildlife management plans. Students will prepare and present wildlife management plans for specific situations. Open to qualified graduate students from other departments. (SP) Barrett

284. Demographic Methods for Population Viability Analysis. (3) Three hours of lecture per week. Prerequisite: 187 or equivalent. Application of demographic methods to the management of plant and animal populations. Conservation problems faced by small populations of threatened species will be examined. Implications for life-history theory will also be discussed. Demographic analyses include (1) an understanding of life cycle diagrams, projection matrices, and age- and stage-based approaches; (2) calculation of population growth rate and sensitivity of demographic parameters to perturbation; and (3) advanced techniques of stochastic simulation modeling, spatial analyses, and population viability analyses will be learned. Offered even-numbered years. (F) Beissinger

286. Physical Properties of Wood. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly 288A. Absorption of water, non-aqueous liquids, absorption of vapors and gases by wood. Shrinking and swelling in water, aqueous solutions, and nonaqueous liquids. Fluid flow including permeability and diffusion. Thermal properties with emphasis on modes of heat transfer important in wood processing and usage. Offered odd-numbered years. (SP) Beall

287. Chemistry of Polysaccharides, Lignin, and Ex- tractive. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Aspects of nomenclature, structures, biosynthesis, reactions, and distribution of terpenoids, fats, flavonoids, tannins, lignins, monosaccharides, and polysaccharides, and nonaqueous related materials occurring in plant material, with emphasis on woody plant structures. Qualified under- graduates may take this course. Offered odd-numbered years. (SP) Beall

288. Special Topics in Wood Science and Technology. Course may be repeated for credit. Prerequisites: Consent of instructor.

288A. Wood Chemistry. (1-3) Advanced study in wood chemistry primarily for advanced graduate students. (F,SP) Staff

288B. Chemical Processing of Wood. (1-3) Advanced study in chemical wood processing primarily for advanced graduate students. (F,SP) Staff

288C. Wood Products Pathology. (1-3) Advanced study in wood product pathology primarily for advanced graduate students. (F,SP) Staff

288E. Wood Physics. (1-3) Advanced study in wood physics primarily for advanced graduate students. (F,SP) Beall

288F. Physical/Mechanical Processing of Wood. (1-3) Advanced study in physical/mechanical processing of wood primarily for advanced graduate students. (F,SP) Staff

289A. Colloquium in Wood Science and Technology. (1) Course may be repeated for credit. Two hours of seminar per week. Focus will be on current wood science and technology. Staff and student research, guest scientists, and technical reports. (F,SP) Staff

289B. Seminar in Wood Science and Technology. (1) Course may be repeated for credit. Two hours of seminar per week. Focus will be on current wood science and technology. Core, Lecture, discussion, and student reports on fundamental principles of wood science and technology. (F,SP) Beall

Special Topics and Independent Studies

292. Presentation and Publication of Biological Research. (2) Three hours of session per week. Course will deal with topics such as organization of research presentations (seminars, papers at meetings), selection and preparation of slides and other visual aids, the scientific publication process, academic and other career options, and considerations about extramural funding. Individual research presentations and other assignments will be required. (F) Resch

293. Research Concepts and Methods. (3) Two and one-half hours of lecture/seminar per week. Prerequisites: Basic courses in statistics. Conceptual and methodological bases of research design, data analysis, and interpretation. Case studies and individual projects critiqued. (SP) Staff

296. Individual Study. (1-7) Course may be repeated for credit. Hours are 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 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. (F,SP) Staff

Environmental Sciences

(College of Letters and Science and College of Natural Resources)

Program Directors
Witney Sousa (Integrative Biology)
Brian Wright (Agricultural and Resource Economics)

Major Advisers
James Bartolome (Environmental Science, Policy, and Management)
Tracy Benning (Environmental Science, Policy, and Management)
Ignacio Rodriguez (Environmental Science, Policy, and Management)

Timothy Duane (Landscape Architecture and Environmental Planning)

James Hunt (Civil and Environmental Engineering)
Lynn Ingram (Geography)
Kirchner (Earth and Planetary Science)
G. Mathias Kondolf (Landscape Architecture and Environmental Planning)

Vincent Resh (Environmental Science, Policy, and Management)
Whendee Silver (Environmental Science, Policy, and Management)

Advisers: Students enrolled in the College of Letters and Science: See Carol Snow in the Group Major Office, Undergraduate and Interdisciplinary Studies, 349 Campbell Hall, (510) 642-2628, http://ls.berkeley.edu/egis/environment/

Students enrolled in the College of Natural Resources: See Kristin Kohn, 260 Mulford Hall, (510) 643-4647.

Choice of College

Students can complete a major in environmental sciences in either the College of Letters and Science (A.B. degree) or the College of Natural Resources (B.S. degree). Course and breadth requirements are identical for all students, regardless of college. Please refer to the announcement of the appropriate college for details.
Major in Environmental Sciences

The environmental sciences major is supervised by an interdepartmental and intercolleague faculty committee and is jointly administered by the College of Letters and Science and 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. Such training is indispensable for those who wish to acquire more than a superficial understanding of the impact of human activities on the environment. Students acquire the necessary skills to rigorously document and predict environmental problems and to make sound recommendations for their avoidance or mitigation.

The environmental sciences major is concerned with interactions between human activities and biological and physical environments on all scales, from local to global. Students elect to emphasize one of three disciplinary fields: biological science, physical science, or social science. The differences between these emphases lie mainly in upper division electives; most required courses, both lower and upper division, are virtually the same for each of the three emphases. Details of course requirements appear below.

The senior research seminar, Environmental Sciences 196A-196B, in which students work intensively on individual research projects under faculty guidance, is a key feature of this major.

Declaring the Major—College of Letters and Science

To be considered for admission to the major in environmental sciences, students need to have at least 30 units of college course work (excluding AP credit); to have completed Environmental Sciences 10 and at least half of the required lower division courses; and to have at least a 2.0 grade-point average in courses taken for the major.

Declaring the Major—College of Natural Resources

Students in the College of Natural Resources may enter as freshmen into the environmental sciences major. Students wishing to transfer from another major and/or college should contact the undergraduate adviser, Kristin Kohn, in 260 Moffett Hall for details.

Required Courses for All Three Areas of Emphasis (Biological, Physical, Social Science)

Lower Division Courses

Environmental Sciences 10;

Environmental Economics and Policy 1 or Economics 3;

Biology 1A-1B (required for biology) or Biology 11A-11B (required for following: ESPM 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 16A-16B may be substituted for biological and social science;

Physics 7A-7B (required for physical science), Physics 8A for biological and social science.

Upper Division Courses

Energy and Resources 102;

Geology 120L, Public Health 142A, or Statistics 131A (prerequisite to EnvSci 100);

Environmental Sciences 100 (prerequisite to 196A-196B);

Environmental Sciences 196A/L and 196B/L;

One of the following: Demography 100, Demography 126, Environmental Sciences 125, ESPM 100, ESPM 102D, ESPM 153, ESPM 155, ESPM 160, ESPM 163, or Environmental Economics 101.

In addition, students must take at least one upper division course in the chosen area of emphasis (biological, physical, social science). Please check with your college office for the list of approved courses.

Students are required to have 30 upper division units of major course work. Any remaining units may come from courses on any of the electives lists.

Honors Program

To be eligible for honors, students must meet the minimum GPA established by their college. See Carol Snow (L & S) or Kristin Kohn (CNR) for further details.

Lower Division Courses

10. Introduction to Environmental Sciences. (3)

Three hours of lecture and one hour of discussion per week and one 8-hour fieldtrip per semester. A survey of biological and physical environmental problems, focusing on geologic hazards, water and air quality, water supply, solid waste, introduced and endangered species, preservation of wetland ecosystems. Interaction of technical, social, and political approaches to environmental management. (F,SP) Staff

10A. Field Study in Environmental Sciences. (1-4)

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,SP) Staff

98. 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. Prerequisites: Regulations set by College of Letters and Science. Seminars for the group study of selected topics not covered by regularly scheduled courses. Topic will vary from semester to semester. (F,SP) Staff

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: Enrolling restricted by regulations listed in the General Catalog. (F,SP) Staff

Epidemiology

(School of Public Health, Interdepartmental Graduate Groups)

Department Office: 101 Haviland Hall, (510) 643-9912
Chair: Arthur Reingold, Ph.D.

Professors

Nancy Adler, Ph.D. (University of California, San Francisco)
John Balmes, M.D. (University of California, San Francisco)
Gladys Block, Ph.D. (Public Health)
W. Thomas Boyd, M.D. (Public Health)
Richard Brand, Ph.D. (University of California, San Francisco)
Patricia Bufton, Ph.D. (Public Health)
Ralph Catalano, Ph.D. (Public Health)
Troy Duster, Ph.D. (Sociology)
Virginia Emster, Ph.D. (University of California, San Francisco)
Brenda Eskesen, Ph.D. (Public Health)
David Freedman, Ph.D. (Biology)
Steven Hulley, Ph.D. (University of California, San Francisco)
Nicholas Jewell, Ph.D. (Public Health)
Bob Lane, Ph.D. (Entomology)
Ron Lee, Ph.D. (Demography)
Lorraine Midanik, Ph.D. (Social Welfare)
Nicholas Pietraski, M.D. (University of California, San Francisco)
William Reeves, Ph.D. (Public Health)
Arthur Reingold, M.D. (Public Health)
Lee Riley, M.D. (Public Health)
William Sataliano, Ph.D. (Public Health)
Mark Segal, Ph.D. (University of California, San Francisco)
Steve Selvin, Ph.D. (Public Health)
Allen Smith, M.D. (Public Health)
S. Leonard Syme, Ph.D. (Public Health)
Ira Tager, M.D. (Public Health)
Glenns Thomson, Ph.D. (Integrative Biology)
Warren Winkelman, Jr., M.D. (Public Health)

Associate Professors

Barbara Abrams, Dr. P.H. (Public Health)
Nancy Padian, Ph.D. (Public Health)

Assistant Professor

John (Jack) Collard, Jr., M.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 Public Health, Epidemiology and Biostatistics. 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 epidem-
Asian American Studies, Native American Studies, and recently arrived immigrants in light of the themes of the course. The course critically examines the internal and external factors contributing to the rise and fall of social and political movements and concludes with an analysis of the current conjuncture of culture, class, gender, and sexual preference in U.S. politics. This course satisfies the American cultures requirement. (F) Muñoz

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 work 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 vary from semester to semester. (F.SP) Staff

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. Three hours of work per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Open to freshmen and sophomores only. Individual research on a topic which will lead to the writing of major paper. Regular meetings with the faculty sponsor. (F.SP) Staff

Upper Division Courses

100. Comparative Ethnic Literature in America. (4) Three hours of lecture per week. Analysis of how selected works (poetry, short stories, novels, drama, and oral literature) reflect African American, Chicano, Asian American, and Native American consciousness and experiences. (F) Hilden, Miles

101A. Social Science Methods in Ethnic Studies. (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) Hilden, Miles

101B. Introduction to Ethnic Studies. (4) Three hours of lecture and one hour of discussion per week. Formerly 41. This survey course will examine the historical experiences of European immigrants, African Americans, and Latinos, emphasizing the themes of students 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, Native Americans, and recently arrived immigrants in light of the themes of the course. Intra-group differences such as class and gender will be discussed. This course satisfies the American cultures requirement. (SP) Saragoza


Upper Division. Ethnic Studies 101A, 101B, and 103; completion of one course from Ethnic Studies 101A, 103AC, 141, 147, 150AC, or 1713; completion of two courses from African American Studies, Asian American Studies, Chicano Studies, Ethnic Studies, Native American Studies, or an approved course (or courses) from another department; Ethnic Studies 197 (4 units cumulative).

Honors. The Department of Ethnic Studies provides a program leading to the A.B. degree with honors. Students are recommended for honors if they have completed at least 30 units and two semesters with an average GPA of at least 3.3 for all work undertaken in the Department of Ethnic Studies and have been approved specifically for honors by the department chair upon recommendation by the faculty advisor. The group major requires three courses for a total of 20 units. Ethnic Studies 101A, 101B, and 103AC are required. (F,SP) Staff

41AC. A Comparative Survey of Protest Movements Since the 60’s. (4) Three hours of lecture and one hour of discussion per week. Formerly 41. An introduction to comparative, interdisciplinarian study of Native American, Mexican American, African American, and Asian American social and political struggles from 1960 to the present. The 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 critically examines the internal and external factors contributing to the rise and fall of social and political movements and concludes with an analysis of the current conjuncture of culture, class, gender, and sexual preference in U.S. politics. This course satisfies the American cultures requirement. (F) Muñoz

110. Narrative Writing. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. A writing seminar with attention to the narrative practices that...
enrich ethnic identities in descriptive, historical, and fictional stories. Banera

122AC. Ethnicity and Race in Contemporary American Films. (4) Three hours of lecture per week. For- merly 122. Course may be repeated for credit. Ethnicity and race are central and complex elements 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) Banera

125AC. Ethnic Music in America. (4) Three hours of lecture and one hour of discussion per week. Ethnic music in America runs the gamut from those that at- tempt to remain true to traditions in their place of ori- gin, to contemporary rock, rap, and music videos made and consumed by many different ethnic groups in America. This course will discuss the music of four groups: Native Americans, European Americans, Chi- canos, and Asian Americans. No experience of music is necessary. Three weeks per topic. Three hours of discussion per topic. Three weeks of lecture per topic. (College of Letters and Science) 

136. Ethnicity, Sexuality, and Ethnic Violence. (4) Three hours of lecture per week. Ethnic minorities select topics from a wide range of areas. This course satisfies the American cultures requirement. (SP) Staff

C126. Ethnicity, Gender, and Sexuality. (4) Three hours of lecture and one hour of discussion per week. Formerly 126. Course focuses on the production of sexualities, sexual identity, and gender difference and reproduction within ethnic groups. Also listed as Undergrad Interdisciplinary Studies C148. (F.SP) Alarcón

128. Film-Video Images of Communities of Color: Analysis and Video Production. (3) Three hours of lecture per week. Prerequisites: Must be taken in con- junction with 120 video production seminar or consent of instructor. Formerly 128. Films analyzed for understanding range of alternatives in filmic concepts of history, culture, class, and personal identity. Se- lected points of view and social and political issues. Production training for making video projects are conceived/shot/edited within teams. (F) Ding

130AC. The Making of Multicultural America: A Comparative Approach. Three hours of lecture per week. Formerly 130. How and why did American society become racially and ethnically diverse? This comparative study of European, Latin, Hispanic, and African immigrant groups ex- amines selected historical developments, events, and themes from the 18th century to the present. This course satisfies the American cultures requirement. (F.SP) Staff

135AC. Contemporary U.S. Immigration. (4) Three hours of lecture per week. Formerly 135S. The myth, re- ality and history of U.S. immigration. This course dis- cusses issues raised by the current immigration in a comparative approach. An examination of theories, politics, and policy of U.S. immigration re- striction. This course satisfies the American cultures re- quirement. (F) Molesky

136. Ethnicity, Gender, and Sexuality. (4) Three hours of lecture per week. Ethnic minorities select topics from a wide range of areas. This course satisfies the American cultures requirement. (SP) Staff

C136. Immigrant Women. (4) Three hours of lecture per week. Prerequisites: Upper division standing and consent of instructor. Examines patterns of women’s im- migration to the U.S. in specific socio-historical and cul- tural contexts. Special attention to race, ethnic and identity issues from woman-centered analysis and methodology. Also listed as Women’s Studies C136. (SP)

141. Racial Politics in America. (4) Three hours of lecture and one hour of discussion per week. Prereq- uisites: 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. (SP) Takaki

144AC. Racism and the U.S. Law: Historical Treat- ment of Peoples of Color. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Sophomores and above. Formerly 144. Intensive his- toric-legal survey of racism in the United States, ex- ploring the legal antecedents of the country’s con- temporary stratified society and emphasizing the role of law as a social policy instrument. Readings and lec- tures will investigate the prevailing legal theory of racism in the U.S. and American legal recognition of the country’s formative legal documents and the con- sequent effects of a myriad of judicial decisions on peoples of color. This course satisfies the American cultures requirement. (SP) Cárdenas

147. Women of Color in the United States. (4) Three hours of lecture per week. Prerequisites: 20 or the introductory class in any of the Ethnic Studies pro- grams. Examines the history and contemporary situ- ations of African American, Asian American, African American and Native American Women. Conceptual focus will draw on lived experiences and theoretical con- structs of race, class and gender. (SP)

150AC. People of Mixed Racial Descent. (4) Three hours of lecture and one hour of discussion per week. Formerly 150. 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 per- taining to topic. This course satisfies the American cul- tures requirement. (F,SP) Staff

159AC. The Southern Border. (4) Three hours of lecture per week. Prerequisites: Upper division standing. The southern border between 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 dimension, and as a region which has been the testing ground for such is- sues as free trade, immigration, and ethnic politics. Also listed as Education 186AC and Geography 159AC. This course satisfies the American cultures re- quirement.

C173. Cultures of U.S. Imperialism: Spanish-American War of 1898. (4) Three hours of lecture and one hour of discussion per week. This survey course ex- plores the history and nature of the Spanish-American War of 1898. Did the war initiate new kinds of affiliations when the U.S. invaded Cuba, Puerto Rico, and the Philippines? Readings by Turner, An- zaldúa, Roosevelt, Martí Rizal, Retamar, Montijo, and Perez, among others. Also listed as American Studies C173. (F) Saldivar

190. Advanced Seminar in Comparative Ethnic Studies. (1-4) Course may be repeated for credit as topic varies. One to four hours of seminar per week. Prerequisites: Consent of instructor. Topics to be an- nounced at the beginning of each semester. (F,SP)

195. Selected Issues in Comparative Ethnic Stud- ies Research. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Pre- requisites: Consent of instructor. Research topics will be chosen by students in consultation with instructor. Issues will vary from semester to semester. (F,SP) Hilden, Takaki

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: 195, consent of instructor, 3.3 GPA on all University work, and a 3.3 GPA in courses in the major. Research seminar for senior eth- nic studies majors designed to support and guide the writing of a senior honors thesis. For senior ethnic studies majors who have been approved for the honors program. (SP) Khatharya Um

197. Field Study in Communities of Color. (1-3) Course may be repeated for credit. Enrollment is re- stricted; see the Introduction to Courses and Curricula section of this catalog. Three hours of fieldwork per week per unit. Must be passed/not passed basis. Prerequisites: Consent of instructor. Supervised community field study. (F,SP) Staff

198. Supervised Group Study. (1-3) Course may be repeated for credit. Enrollment is restricted; see the In- troduction to Courses and Curricula section of this cat- alog. 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. (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 which leads to the writing of major paper. Regular meetings with the faculty sponsor. (F,SP) Staff
Film majors have two options for completing their language requirement:

A. Students may complete the third semester of a college-level language course in a single language (e.g., French 3), or

B. Students may choose to complete the second semester of a college-level language course in two different languages (e.g., German 2 and Swahili 2).

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. Students should be aware that if they are also using the course to satisfy the L&S foreign language requirement, it must be taken on a letter-graded basis.

Any natural language is acceptable. Students who are native speakers of a language other than English may demonstrate their language competence 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 written proficiency.

Upper Division (30 units of upper division credit are required)

Required Courses: See the major “Announcement of Classes” for current offerings that satisfy these requirements and for specific topics being taught.

Film Theory: One course on the history of film theory (e.g., Film 100, Rhetoric 129).

Auteur: One course on an individual auteur (e.g., Film 151, Italian 170, Scandinavian 115).

Genre: One course on film genre (e.g., Film 108, English 176).

Film Electives: (Approximately 18 units) required to complete the major requirements of 30 upper division units (e.g., African American Studies 192, Asian American Studies 171, Film 197, French 170, History 103, Italian 170, Native American Studies 156. Note: The class topics may change; be sure they apply to film, and if you are in doubt please check with your Film adviser).

Honors Program. To be eligible for admission to the honors program in Film, a student must have attained senior standing with a grade-point average of 3.3 or higher on all University work and a 3.5 grade-point average or higher in courses in the major. The levels of honors are as follows: Honors, High Honors, and Highest 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 preproduction of the thesis and the film submitted as a document, for 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 carried out under the film track in Rhetoric (see the Rhetoric section of this catalog).

Designated Emphasis in Film Studies

Ph.D. students at Berkeley may add a Designated Emphasis in Film Studies to their major fields. The designated emphasis provides curricular and research resources for students who want to concentrate on film within their respective disciplines and have their work formally recognized. Designed to bring together faculty and students from different departments, the program provides a unique context for rigorous cross-disciplinary thinking and promotes innovative research in the theory and history of cinema.
Applicants must be enrolled in a doctoral program at Berkeley and must have completed the film theory seminar (Film Studies 200), offered each fall semester. Students admitted to the Designated Emphasis Program must complete the following requirements: a minimum of three graduate seminars in film studies taken at Berkeley; Film Studies 200, Film Studies 240, and a graduate seminar cross-listed with Film Studies 240. Note: Independent study courses may not be used to fulfill this requirement. A member of the Graduate Group in Film Studies must be an unofficial member of the Ph.D. oral qualifying examination committee. The dissertation must contribute to the study of film.

Lower Division Courses

R1A. The Craft of Writing - Film Focus. (3) Three hours of lecture/discussion per week, plus individual conferences. Formerly Rhetoric RS5A. Rhetorical approach to reading and writing argumentative 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. (3) Three hours of lecture-discussion per week, plus individual conferences. Formerly Rhetoric RS5B. 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. An introductory seminar program. Formerly Freshman Film Seminar Program. This 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 seminar topics change from semester to semester and focus vary from department to department and semester to semester. Enrollment limited to 15 freshmen. (F.S.P) 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 conversion 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. Prequisites: 25A or equivalent. The sound era through 1971. (F) Staff

28A. The Documentary Film. (3) Three hours of lecture and one hour of laboratory per week. Prequisites: 25A or equivalent. An introduction to film art and art history with an emphasis on the study of film in American culture. This course satisfies the American cultures requirement. (F.S.P) Staff

28B. The Avant-Garde Film. (3) Three hours of lecture and one hour of laboratory per week. Prequisites: 25A or equivalent. An analysis of the development of the documentary film, including examples by Vigo, Duchamp, Leger, Buiruel, Clair, Deren, Brakhage, Kubekoa, Snow, Gehr, Frampston, and Rainier. (F.S.P) Staff

40AC. Film Seminar in American Cultures. (3) Course may be repeated for credit as topic varies. Students may remove a deficient grade in 40 by taking 40AC. Three hours of lecture per week. Topics are to be announced to students interested in exploring the history and aesthetics of cinema but do not intend to major in film. The course traces the development of world cinema from the first films of the 1890s to the 1970s, drawing on examples from America, European, Asian, and Third World cinema. Staff

98. Directed Group Study. (1-4) Course may be repeated for credit. One to four hours of lecture per week. Must be taken on a passed/not passed basis. Prerequisites: 25A or equivalent and consent of instructor. Supervised research by lower division students. Staff

99. 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 film majors with consent of instructor. Independent research by lower division students arranged by faculty. Staff

Upper Division Courses

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

108. Special Topics in Film Genre. (4) Course may be repeated for credit. Three hours of lecture and three to four hours of laboratory per week. Prerequisites: Consent of instructor. Formerly C108. The study of films as categorized either by industry-identifies genres (westerns, horror films, musicals, film noir, etc.) or broader interpretive modes (melodrama, realism, fantasy, etc.). (F.S.P) Staff

135AC. Film of American Cultures. (4) Course may be repeated for credit as topic varies. Three hours of lecture and three to four hours of laboratory per week. Prerequisites: 25A or equivalent. Study of ethnic diversity in American film. Takes students to major and minorities and identifies patterns of oppression and liberation among non-dominant groups. (F,SP) Staff

151. Auteur Theory. (4) Course may be repeated for credit as topic varies. Three hours of lecture and one hour of laboratory per week. Prerequisites: Consent of instructor and director of undergraduate studies. Selected topics in the study of film. (F.S.P) Staff

151E. Seminars in Film. (4) Course may be repeated for credit as topic varies. Three hours of lecture and one hour of laboratory per week. Prerequisites: Declared film major or consent of instructor. Selected topics in the study of film. (F.S.P) Staff

180. Screenwriting. (4) Four hours of lecture per week. Prerequisites: Consent of instructor and director of undergraduate studies. Selected topics in the study of film. (F.S.P) Staff

197A. Field Study at the Pacific Film Archive. (2) Three hours of fieldwork and one hour of seminar per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor; film majors only. Students will learn about film bibliography and research materials. 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 inclusion in the archives. Interns will gain experience in various aspects of archival and exhibition work, as well as a broad knowledge of the kinds of film reviews and criticism found in a variety of sources. (F.S.P) Staff

197B. Field Studies for Majors. (3) Course may be repeated for credit. Individual conferences with Faculty Sponsor and at least nine hours of field work at field study. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor; film majors only. The supervised field program may include experience in a broad range of pre- and post-production film and video production related activities. The student will develop the field experience and its relationship to academic training with a member of the faculty on the Film Advancement Committee. Faculty sponsor and student will establish individual meeting times and academic requirements for acceptable completion of the course. Commitment to at least nine hours of field work per week. (F.S.P) Staff

197C. Avant-Garde Film Study. (2) Two hours of fieldwork and one hour of discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Declared film major, 25B (may be taken concurrently). Interning at Pacific Film Archive three hours per week. Interns will gain experience in various aspects of archival and exhibition work, with a focus on experimental film. Working with PFA's experimental film curator, interns will curate an exhibition program from the PFA's avant-garde collection (to be presented in PFA's evening program the following semester), and will write program notes. Interns will also contribute to a database indexing exhibition of experimental film and video at PFA, and research a bibliography on some aspect of experimental film (which will eventually be published as part of a larger project indexing all published articles on experimental film). (F.S.P) Staff

197D. Field Study at Film Quarterly. (2) Two hours of fieldwork and one hour of discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Declared film major with junior or senior standing. Consent of instructor. Interning at Film Quarterly. Interns will gain experience in the editorial process. This internship will help the student refine critical and analytical skills, develop editorial skills, and experience working on a film journal. (F.S.P) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit as topic varies. One to four hours of lecture per week. Must be taken on a passed/not passed basis. Prerequisites: 25A or equivalent and consent of instructor. Major and senior standing. Group studies of selected topics which vary from year to year. Field shall not coincide with that of any regular course and shall be specific enough to allow students to write an essay based on the study. (F.S.P) Staff

199. Supervised Independent Study for Advanced Undergraduates. (1-4) Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: 25A or equivalent and consent of instructor. Reading and experience with the cinematic texts that shall not coincide with that of any regular course and shall
be specific enough to enable the student to write an essay based upon his/her study. (F,SP) Staff

Graduate Courses

200. Graduate Film Theory Seminar. (4) Three hours of seminar and one hour of discussion per week. Prerequisites: Graduate standing or consent of instructor. This seminar will examine both traditional and recent critical approaches to a 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 postmodernism. Illustrations will be taken from film history from 1910 to 1980. Staff

201. Graduate Film Historiography. (4) 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 history are the focus of this seminar. Interested primarily for first-year film students, 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 of technology, institution-formation, exhibition, cultural history, and its reception. (F,SP) Staff

240. Graduate Topics in Film, (4) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. Selected topics in the study of film. Staff

298. Special Study. (1-4) Course may be repeated for credit as topic varies. Individual conferences. Prerequisites: Consent of instructor. Graduate standing. 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

The Folklore Program

This program is designed to provide graduate students with a competent knowledge of both the materials, methods, and traditions of folklore and the various methods of studying these materials. The program is an interdisciplinary one in which faculty members from both the humanities and the social sciences participate. 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.

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 humanist expression which is 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 manifested in customs and beliefs, it has close affiliations with anthropology, design, history, linguistics, philosophy, psychology and sociology. Consequently, a good undergraduate record 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 course credits are allowed for the thesis.) Students 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 160A, 160B. The Forms of Folklore. In addition, all students are required to take the interdisciplinary Folklore 250A-250B, Folklore Theory and Techniques. The student must also demonstrate proficiency in reading at least one foreign language. German is perhaps the most useful language for folklore studies, but French, Spanish, or some language intimately connected with the M.A. thesis may be approved to satisfy the language requirement. Questions on the requirements for the M.A. in folklore should be addressed to the graduate adviser, Folklore Program, in 201 Kroeber Hall.

Graduate Courses

250A-250B. Folklore Theory and Techniques. (4) Two hours of seminar per week plus seven hours of outside work. An introduction to the methodology and orientation of diverse topics related to fieldwork and research in folklore. Dundes

266. The Folktales and Allied Forms. (4) Two hours of seminar per week. The study of folk narrative, including motif and type classifications, theories of myth and folklore, and methods of analyzing prose narrative.

296. 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.

French

(College of Letters and Science)

Program Office: 201 Kroeber Hall, (510) 642-2092 http://ls.berkeley.edu/dept/french/Folklore.FTL
Chair: Alan Dundes, Ph.D.

Professors

Ronelle Alexander, Ph.D. (Slavic)
Stanley Brandes, Ph.D. (Anthropology)
Alan Diehl, Ph.D. (Anthropology)
John F. Lindow, Ph.D. (Scandinavian)
John D. Niles, Ph.D. (English)
Bonnie Wade, Ph.D. (Music)

Associate Professor

Daniel F. Melia, Ph.D. (Rhetoric)

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Bertrand Augst (Emeritus), Ph.D., University of Colorado. 19th- and 20th-century literature; film history and theory

Assistant Professors

Kari Britto, Ph.D., Drew University. Francophone literature
Susan Hanan, Ph.D., Johns Hopkins University. 17th- and 18th-century literature
Debarati Samant, Ph.D., Princeton University. 19th- and 20th-century literature, intellectual history, literature and performance

Lecturers

Gérard Jian (Emeritus), M.A., Stanford University

Department Overview

The Department of French places primary emphasis on instruction in French at all levels, and the majority of its upper division courses are conducted entirely in that language. Nonmajors and nonminors, however, may write in English in any upper division course.

Note: Students should consult the department “Course Description,” issued at the beginning of each semester, for current course topics.

The Major

Courses 1, 2, 3, 4, and 35 or their equivalents; 9 upper division courses in French. Two upper division units must be taken in residence.

There are two options in the major, which share a common base in language study and the acquisition of competence in spoken and written French. Option A offers a strong concentration in literature and is especially suitable as preparation for further literary study for those interested in college-level teaching careers. Option B focuses on literature in the broader context of French civilization in its historical, social, and artistic dimensions and introduces students to an interdisciplinary approach.

Option A. French 102 and three courses chosen from three different centuries (112-120); one course from 121-126; one course from 145-189; three electives. Courses H195A-H195B and 199 do not count toward the major.

Option B. French 102 and three courses chosen from 145-189 excluding 180A-180D; one course from 180A-180D; one course from 112-120; three electives. Courses H195A-195B and 199 do not count toward the major.

Honor Programs (H195A-H195B). Senior majors in French with a grade-point average of 3.5 overall and in the major may apply to the honors program in French. Students who meet specific criteria may obtain the application to the honors program from the undergraduate assistant. Upon admission to the honors program, students undertake research on an approved topic of their choice in French literature or civilization. The results of this research constitute an honors essay. written under the supervision of a member of the regular faculty. Credit and grade are awarded upon completion of the sequence. The honors sequence is undertaken in addition to the course work for the major. Prospective and current majors should consult the department’s brochure. The Undergraduate Major in French.
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 administratively 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 either four or five courses.

General Minor in French: French 102 and four upper division courses from French 103-189 (see note below).

Minor in French Literature: French 102 and four courses from 103-126 or 140A-140D (see note below).

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 150-139 or 145-149, and French 35 (Phonetics).

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 or 140A-140D may be counted towards the major or minor programs.

Graduate Study

The Ph.D. Program. The Ph.D. program in French incorporates French literature and linguistics. In the literature track, students are asked to define three areas of study within French literature. Each of the areas, while related to the other, allow students to view the discipline from a different perspective. The areas of study for the literature track are: (1) the work of a single major author; (2) a historical period in French literature; (3) the development of a form, genre, or literary problematic. Students outline a proposed program of study in these three areas by submitting a Ph.D. program proposal during the first year of study, the Ph.D. level.

In the linguistics track, students are asked to choose particular areas of primary interest within the broad fields of (1) the structure of modern French; (2) the history of the French language; (3) the application of linguistics to the analysis of literature. Students interested in a career in applied linguistics may be advised to base their understanding of (4) theory and methodology of general linguistics. Students also choose an advanced field of their choice germane to these studies. Ph.D. students in both tracks take a minimum of eight courses during the first four semesters of graduate study (M.A. phase), with additional courses required in each track to be chosen in consultation with the graduate adviser. The foreign language requirement is advanced knowledge of one foreign language other than French. For more detailed information concerning the Ph.D. programs, students should consult the department.

Ph.D. in Romance Languages and Literatures (Emphasis in French). Students admitted for this degree have a choice of two plans of study. Plan I includes a detailed knowledge of French literature and philology, a second Romance language as a complementary 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 languages, to be chosen by the student and the graduate adviser in accordance with the student’s special interest in French. The candidate satisfies the course requirements as they and the adviser deem necessary in light of the approved plan and program.

Language requirement: Latin, French, Italian, and Spanish. Knowledge of German is recommended. For more detailed information concerning this program, 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)
2. French for Graduate Students, Beginning. Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Preparation for graduate reading examinations in field of English and in all other disciplines. (F)
3. Elementary French. (5) Five hours of lecture and one hour of laboratory per week. Prerequisites: 1 or equivalent. Introduction to speaking, listening, reading, and writing in French. Continuation of French 1. (F,SP)
4. French for Graduate Students, Advanced. Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Preparation for graduate reading examination in field of English and in all other disciplines. (SP)
5. Intermediate French. (5) Five hours of lecture per week. Prerequisites: 3 or equivalent. Advanced training in listening, reading, writing, and speaking French. Review and refinement of grammar. (F,SP)
6. Advanced Intermediate French. (5) Five hours of lecture per week. Prerequisites: 4 or equivalent. Advanced French. Writing and speaking French. Review and refinement of grammar. (SP)
7. 120A-120B. Twentieth-Century Literature. (4;4) Course may be repeated for a maximum of 8 units. One course from 121A-121B may be repeated once for credit with a different topic and with consent of Undergraduate Adviser. Three hours of lecture per week. Prerequisites: 102 or equivalent. Medieval literature from the Chanson de Roland to the Roman de la Rose. (F,SP) Staff
8. 112A-112B. Medieval Literature. (4;4) Course may be repeated for a maximum of 8 units. One course from 112A-112B may be repeated once for credit with a different topic and with consent of Undergraduate Adviser. Three hours of lecture per week. Prerequisites: 102 or equivalent. Medieval literature: Joinville to Villon. (F,SP) Staff
9. 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 intellectual and aesthetic trends of the time, including humanism, evangelism, and the development of a new poetic language. (F,SP)
10. 117A. Seventeenth-Century Literature. (4) One course from 117A-117B may be repeated once for credit, for a maximum of 8 units, with a different topic and consent of the undergraduate adviser. 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 solve the crisis in Renaissance values, formulation of new concepts in philosophy and psychology, experiments with traditional forms in poetry, fiction, and the theatre. Preciosity, Desartes, and rationalism. (SP,SP)
11. The concept of classicism and the development of tragedy. Jansenism, the doctrine of Port-Royal. Social satire and comedy. (F,SP)
12. 118A-118B. Eighteenth-Century Literature. (4;4) Three hours of lecture per week. Prerequisites: 102 or equivalent. French literature from the first half of the 18th century to the development of modern art forms in the theater and the novel. (F,SP)
13. A. Authors from the second half of the 18th century stressing the importance of the “Movement Philosophe” and the development of libertine values as well as the emergence of the pre-Romantic aesthetic. (SP,SP)
14. 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 Parmasse and Symbolism. Development of the novel, realism, and naturalism. (F,SP)
15. 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 adviser. Three hours of lecture per week. Prerequisites: 102 or equivalent. Major literary movements and their impact on the world, with special emphasis on French literature. (F,SP) Staff

French 102 and four courses from 103A-103B or 140A-140D may be counted towards the major or minor programs.
hours of lecture per week. Prerequisites: 102 or equivalent.
A. The modern novel, the avant-garde, cubist poetry, Dada and Surrealism, the theatre before the Second World War.
B. Development of the novel, poetry, and theatre since the Second World War. Satire and existentialism, the theatre of the absurd, nouveau roman. (F,SP)

121A-121B. Literary Themes, Genres, and Structures. (4,4) 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 fantastique,” science fiction, autobiography, French lyric poetry. (F,SP)

122A-122B. Literary Criticism. (4,4) 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. The course will focus on literary criticism and will discuss the various options proposed as well as the relationship between criticism and fiction or philosophy in a given writer’s work. (F,SP)

123. Prose Fiction. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Studies in the French novel. (F,SP)

124A-124B. Modern Theatre. (4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Studies in 20th-century theatre. (F,SP)

125A-125B. Poetics and Poetry. (4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Studies in French poetry.

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, intensive writing, and close study of short literary excerpts. In-depth corrections of compositions, and occasional debates. (F,SP)

131A-131B. Translation and Debate. (4,4) 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) Kavanagh, Sorgen

136. Scientific French. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 102 or equivalent. Introduction to the languages of science, technology, and research in contemporary France. Through a reading of both historical texts and recent journal articles available only in French, we will analyze the principle categories and characteristics of French technological and scientific discourse. Discussion topics include the scientific method, approaches to research, and the interplay between science and society with a particular focus on the role of language teaching methods. Students should have a working knowledge of both oral and written French. (F,SP) Kern

140A-140D. French Literature in English Translation. (4,4) Three hours of lecture per week. Major texts of French literature. Readings and writing assignments in English for non-majors; in French for French majors and minors. Class discussion in English. (F,SP)


145. History of the French Language. (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—including word formation—syntax, and semantics) as applied to the French language. (F,SP)

147. Special Topics in French Linguistics. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 102 or equivalent. Formerly 133. Topics vary from year to year. (F,SP)

148. French Dialectology. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Formerly 135. The varieties of French spoken in France as well as in French-speaking areas outside Europe. (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 Francofrench literature: traditional and French influences, structure, relationship between language and message. (F,SP)

152. Quebecois Literature and Culture. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. A study of Quebecois culture and civilization: novels, films, society. (F,SP)

160A. French Historical Writing. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. The development of concepts of history in French writing. The Chroniqueurs, the humanists, Bossuet, Michelet and examples of the authors who may be studied. Topics vary from year to year. (F,SP)

161A-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 equivalent. The study of a year in French history from many points of view—political, sociological, intellectual, and artistic, as well as literary. (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)

165. Modern Notions of Utopia. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. The idea of social and sexual utopia in Charles Fourier, and its relevance to 20th-century political and literary theories of utopia in France. (F,SP)

170. French Films. (4) Three hours of lecture and two hours of studio per week. Prerequisites: 102 or equivalent. An introduction to a variety of French and foreign films. Formerly 198A-198B. (F,SP)

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 “Romanticism,” in French cultural history. Topics vary from year to year. (F,SP)

172A-172B. Psychoanalytic Theory and Literature. (4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent. The relevance of psychoanalysis to literary texts. Concepts of fantasy, of the self, and of desire applied to texts by Racine, Balzac, Lautreamont, Rimbaud, and Proust. (F,SP)

173. Linguistics and Literature. (4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent; 146 or equivalent; or consent of instructor. The impact of linguistics on the theory of literature and the practice of literary criticism in recent years. (F,SP)

174. Music and Literature. (4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent. A consideration of the ways in which certain authors, as well as some composers, have sought to relate what might be thought of as two manifestations of language: song and poem, or musical score and literary text. (F,SP)

175A-175B. Literature and the Visual Arts. (4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Formerly 132A-132B. 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 studio 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)

178A-178B. Studies in French Film. (4,4) Three hours of lecture and one hour of laboratory per week. Prerequisites: 102 or equivalent; 170 or equivalent. Topics vary from year to year. (F,SP)

180A-B. French Civilization. (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 Middle Ages; 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)

184A-184B. French Literature in its Cultural Context. (4,4) Three hours of lecture/discussion per week. Prerequisites: 102 or equivalent. A survey of French literature from the Middle Ages to the end of the 18th century, in which we will study the greatest masterpieces of French literature prior to the Revolution. (F,SP)

185. Literature and Colonialism. (4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Studies in the literature developed in France at the height of the colonial era. The themes of travel, exoticism, neo-civilization, the reaction of European countries to the discovery of Africa. (F,SP)

H195A-H195B. Honors Sequence. (2,2) Credit and grades are awarded on a pass/fail basis only. 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 super-
vision of a member of the faculty during two semesters of their senior year. (F,SP)

199. Supervised Independent Study and Research for Advanced Undergraduates. (2-4) Independent conference. Must be taken on a passed/not passed basis. Prerequisites: Restricted to seniors with overall GPA of 3.0 and GPA of 3.0 in French. Enrollment restricted according to College regulations. Individual instruction in only areas not covered by courses. (F,SP)

Graduate Courses

200. Proseminar. (1) One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. This course is designed to give all new graduate students an overview 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 the graduate career, issues that pertain to specific fields of research, and questions currently being debated across the profession. (F) Staff

201. History of the French Language. (4) Course may be repeated for credit. Three hours of lecture per week. Formerly 201A-201B. A history of the French language from its Latin origins through the modern period. Emphasis on “external history” of the language in relation to other social and cultural phenomena. (4;4) R prefix=course satisfies R&C requirement

C202. Linguistic History of the Romance Language. (3) Three hours of lecture per week. Prerequisites: Knowledge of at least two of the major Romance languages (French, Italian, and Spanish), formerly Romance Phonology, Linguistic development of the major Romance languages (French, Italian, and Spanish) from the common Latin origin. Comparative perspective, combining historical grammar and external historical data. Also listed as Spanish C202 and Italian C201.

203. French Syntax. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year; current topics in the Department’s Announcement of Courses.

204. Oral and Written Discourse in French. (4) Two hours of lecture 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. (4;4) R prefix=course satisfies R&C requirement

Sorgen

205. 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)

207. Linguistics and Literature. (4) Three hours of lecture per week. The impact of linguistics on the theory of literature and the practice of literary criticism in recent years. The application of concepts and methodology of a pragmatically-based text linguistics to the study of French literary texts—narrative fiction and drama. (F,SP)

208. Cognitive Aspects of Foreign Language Reading and Writing Development. (4) Three hours of seminar per week. Examination of the underpinnings of development of reading and writing skills within foreign language acquisition, their complex nature, and their problematic manifestations among student populations. Exploration of the intellectual mechanisms involved in what people learn to read, view, and write. (4;4) R prefix=course satisfies R&C requirement

AG suffix=course satisfies American cultures requirement

210A-210B. Studies in Medieval Literature. (4,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year. Required of all instructors teaching second-year French, grading and testing; observations; supervised classroom teaching. (F,SP) Kern, Schultz

211A-211B. Reading and Interpretation of Old French Texts. (4,4) 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.

212A-212B. Old Provençal Literature. (4,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Required of students with a major basis in 12th and 13th century texts written in the langue d’oc with special emphasis on troubadour lyric poetry. Duggan

218. Studies in Late Medieval 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. Staff

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 topic. Kavanagh

230A-230B. Studies in 17th-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.

240A-240B. Studies in 18th-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.

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. (4) Three hours of seminar per week. Focuses upon the relationship between oral and written 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 imagery; idealization of lost worlds; the conflict of traditional culture and modernism; the search for political identity and independence.

253. Nineteenth-Century Fiction. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week.

254A-254B. Nineteenth-Century Poetry. (4,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Studies in 19th-century French poetry. Topics will vary from year to year.

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 topic.

270A-270B. Literary Criticism: Recent Work in 20th-Century French poetry. Topics will vary from year to year. See the Department’s Course Description for current topic.

280A-280B. Interdisciplinary Studies in French. (4,4) Three hours of seminar per week. Interdisciplinary seminars and discussion sections on methodology. Staff

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.

285. French Art Criticism and Literature: Late 19th Century. (4) Only graduate students may repeat courses. Three hours of seminar per week; laboratory observations; supervised classroom teaching. Involving the writing of a report. May not be substituted for available graduate courses. (F,SP)

288. Special Study. (1-4) Course may be repeated for credit. Individual conferences. Designed for students engaged in experimental or independent field, involving the writing of a report. May not be substituted for available graduate courses. (F,SP)

Professional Courses

291. Special Study for Graduate Students. (1-8) 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 exam in consultation with the field adviser. (F,SP)

292. Individual Study. (1-8) May not be used to satisfy units or residence requirements. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: At least 16 units beyond B.A. Individual study with an adviser, intended to provide an opportunity for qualified students to prepare for the various examinations required of candidates for the Ph.D. (F,SP)

293. Teaching French in College: First Year. (3) Three hours of lecture and attendance at demonstration class for five hours per week. Must be taken on a satisfactory/unsatisfactory basis. Required of all instructors teaching French 1 for the first time. (F,SP)

294. Teaching French in College: Advanced First Year. (3) Three hours of lecture and attendance at demonstration class for five hours per week. Must be taken on a satisfactory/unsatisfactory basis. Bi-weekly 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. (F,SP)

295. Teaching French in College: Second Year. (3) 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: 301, 302, 303 or equivalents. Lectures and discussion on the methodologies used in teaching second-year French, grading and testing, attendance at demonstration classes; language laboratory observations; supervised classroom teaching. Required of all instructors teaching French 3 or 4. Schuett

296. Teaching French in College: Advanced Second Year. (3) 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: 301, 302, 303 or equivalents. Lectures and discussion of second-year French, grading and testing; occasional attendance at a demonstration class; language laboratory observations; supervised classroom teaching. Required of all instructors teaching French 4. (F,SP)
(1) Global Environmental Change is concerned with long- and short-term alterations of the physical world inhabited by humankind and human impacts on interlocking systems of the natural environment (climate, landforms, biota). 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 paleoenvironmental reconstruction, paleoclimates, glacial and riverine environments, Quaternary stratigraphy, geochronology, climatology, coastal morphology, and ocean and coastal change.

(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 patterns of access to and control over resources, property and management regimes, and systems of cultural meaning. Special 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 social and political economies at various spatial scales (urban, regional, national, international). Central concerns of Local and Global Relations are analyzing 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 equal 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.

Extensive information on the department can be found at http://geography.berkeley.edu/.

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 three pairs: 30 or 35, 50AC or 70AC, 4 or 20. (Transfer students should consult with the undergraduate adviser to avoid repeating lower division work.)

Upper Division. Majors take at least eight upper division courses, five of which must be in one specialty group. The remaining three courses must include one from each of the other specialty groups and one from the methods group. Everyone choosing Option 1 must take Geography 130; everyone choosing option 2 must take Geography 110; everyone choosing option 3 must take Geography 140.


II. The Local-Global Option: Geography 100, 104, 109, 110, 112, 114, 120, 121, 150, 151, 156, 157, 158, 159AC, 160A-C160B, 161, 162, 163, 167, 168, 175*.

III. The Physical-Environmental Change Option: Geography 109, 133*, 134, 140A, 140B, 141, 142, 143, 144, 145, 146, 147, 148, 149, 175*.

Methodology: 180-190.

*Course designation varies according to instructor and content. For more information, consult the undergraduate adviser.

The Minor

Students in the College of Letters and Science may choose a minor in geography. Students may choose more than one minor of their choice, normally in a field both academically and administratively distinct from their major.

Required: A minimum of 20 upper division units (five upper division courses), all taken for a letter grade. Students must maintain an overall grade point average of 2.0 for all courses taken for the minor. A minimum of three courses must be taken on the Berkeley campus. Students must take at least one course in the physical area (100-139, 134, 140A, 140B, 141, 142, 144, 146, 147, 148, 175, 180, 184, 185) and one course in the human area from among the courses listed in the range of Geography 100-139. Students may select courses in the range of 175-189, but several of those courses have limited enrollment and require permission of the instructor. Geography 197, 198, and 199 cannot be used for minor requirements. Students should contact the student services assistant to obtain an update to the courses listed above.

Graduate Program

The graduate program is directed toward the Ph.D., with the M.A. degree as a stepping stone. Students are admitted to graduate studies only in the fall semester. The GRE general examination is required. For admissions information contact Carol Page (510-642-3904) or consult the department’s web page at http://geography.berkeley.edu/Grad-Program.html.

The Master’s Program

All students complete the same general M.A. unit requirements: 20 for Plan I (by thesis) and 24 for Plan II (by comprehensive examination). Because students begin graduate studies with widely different backgrounds, course work toward the M.A. will differ from student to student. All students admitted with an advanced degree from another discipline will be expected to complete an M.A. in geography unless they are granted an exception. A past M.A. thesis in geography may be acceptable in lieu of a second thesis. Past course work may be acceptable toward the unit and breadth requirements. Students must complete at least one year of residence on the Berkeley campus.

General M.A. Requirements: (a) Geography 200A and 200B; (b) a total of 20 (Plan I) or 24 (Plan II) units of course work; (c) a minimum of one course from each of the three topic areas (see Department Graduate Brochure for list of courses); (d) completion of the foreign language requirement; (e) development of a regional focus; (f) Geography 295 every semester (until advanced to candidacy for the Ph.D.); (g) completion of degree within three years of entering the program.

Plan I M.A. Program (by thesis). Plan I calls for 20 units of upper division and graduate courses and a thesis. The M.A. thesis is written under the direction of a committee of three faculty members, at least two from Geography. The thesis should consist of 50 to 80 pages of text, or the text of a publishable article. It can be based on secondary literature or original research.

Plan II M.A. Program (by examination). Plan II calls for 24 units of upper division and graduate courses and a Pass on a comprehensive examination. The comprehensive consists of three essay exams in different geographic fields, at least one of which is the student’s field of intended specialization. Those with an undergraduate background in geography will find the following-
ter not more than three full semesters of graduate work, those entering from other disciplines after not more than four semesters.

M.A. Foreign Language Requirement. All candidates must demonstrate a knowledge of a foreign language at a level of competence needed to fully comprehend a technical article (before the thesis is filed or the comprehensive examination is taken). Students may fulfill this requirement either by completing two semesters or three quarters of a college-level foreign language with a grade of C or better, or by taking a translation examination graded by two faculty members. (In most cases, a translation exam will satisfy both the M.A. and Ph.D. foreign language requirements.)

The Doctoral Program

Advancement to the Ph.D. Program. Upon completion of the master's program, the faculty will evaluate each student's overall performance and recommend whether or not the student will be allowed to continue in the Ph.D. program.

Post-M.A. Requirements. Students must fulfill one additional year of course work (a minimum of 14 units in geography as well as any necessary units outside of the 100 series.) Students must be graduate students. This additional year of course work allows students time to experience further intellectual development and to focus research interests. Students are required to take a dissertation qualifying exam and undertake the qualifying examination. Students in the doctoral program must complete a minimum of two years in residence.

Ph.D. Foreign Language Requirement. At the Ph.D. level, the language requirement may be fulfilled with any language appropriate to the student's training program or intended dissertation research. Where research necessitates, a student's program advisor may require the acquisition of competence in additional languages. Students may fulfill this requirement either by completing four semesters or six quarters of a college-level foreign language with a grade of C or better, or by taking a translation examination graded by two faculty members. The Ph.D. language requirement should be completed before the student's third year in residence.

Ph.D. Qualifying Examination. Before taking the qualifying examination ("orals"), students must do the following: complete post-M.A. course work; complete the language requirement; have a B average in all work undertaken in graduate standing; have obtained a minimum of 75 percent of their units listed as "completed" and have at least one semester of academic residency; be registered during the semester in which the exam is taken. The qualifying exam must be taken no later than two months after the Graduate Division’s filing deadline. Upon acceptance of the dissertation commitments and approval by the Dean of the Graduate Division, the degree of Doctor of Philosophy is awarded.

Lower Division Courses

1. Global Environments. (4) Three hours of lecture and two hours of laboratory per week. The global pattern of ocean and atmospheric circulation and the impact of human-induced change in ocean biota and environments. New approaches to saving the oceans. History and ecology of ocean biota and environments. The exploitation of marine resources.

2. Global Environmental Change. (4) Three hours of lecture and one hour of laboratory per week. Historical and contemporary cultural-environmental patterns. The development and spread of cultural adaptations, human use of resources, transformation and creation of human environments.

3. World Regions, Peoples, and States. (4) Three hours of lecture and one hour of discussion per week. The basis for human-environmental change is explored on a variety of time and spatial scales so as to enhance our capability to distinguish between natural and human-induced climatic, biotic, and physical changes.

4. Freshman Seminar. (1) Three hours of lecture and one hour of laboratory per week. An overview of the interactive processes that result in the mosaic of environments on the earth and the controls on their distribution. Environmental change is explored on a variety of time and spatial scales so as to enhance our capability to distinguish between natural and human-induced climatic, biotic, and physical changes.

5. California and the Pacific Rim. (4) Three hours of lecture and one hour of laboratory per week. Formerly 150AC. California, land of contrasts, land of diversity: economic, human, physical. The extraordinary achievements of the state's industry, agriculture, and resource development. The sun-dappled landscapes, the rainy coast, the arid desert, the high mountains.

6. Global Environmental Change. (4) Three hours of lecture and two hours of laboratory per week. An overview of the interactive processes that result in the mosaic of environments on the earth and the controls on their distribution. Environmental change is explored on a variety of time and spatial scales so as to enhance our capability to distinguish between natural and human-induced climatic, biotic, and physical changes.

7. Globalization. (4) Three hours of lecture and one hour of discussion per week. How and why are geographical patterns of employment, production, and consumption changing? What are the consequences of NAFTA, an expanded European Community, and post-colonial migration flows? How is global restructuring culturally reworked locally and nationally?

8. Freshman Seminar. (1) Three hours of lecture and one hour of laboratory per week. An overview of the interactive processes that result in the mosaic of environments on the earth and the controls on their distribution. Environmental change is explored on a variety of time and spatial scales so as to enhance our capability to distinguish between natural and human-induced climatic, biotic, and physical changes.

9. California and the Pacific Rim. (4) Three hours of lecture and one hour of laboratory per week. Formerly 150AC. California, land of contrasts, land of diversity: economic, human, physical. The extraordinary achievements of the state's industry, agriculture, and resource development. The sun-dappled landscapes, the rainy coast, the arid desert, the high mountains.

10. Globalization. (4) Three hours of lecture and one hour of discussion per week. How and why are geographical patterns of employment, production, and consumption changing? What are the consequences of NAFTA, an expanded European Community, and post-colonial migration flows? How is global restructuring culturally reworked locally and nationally?
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. This course 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.

90. Seminars for Lower Division Students. (3) Three hours of lecture and one hour of term paper per week. A reading and research seminar for freshmen and sophomore students. Topics to vary.

Upper Division Courses

103. History of Environmental Thought. (3) Three hours of lecture per week. This course traces the roots of the changing practices, theories, and representations shaping and shaped by environmental thought.

104. The City in the Third World. (4) Three hours of lecture per week. Major themes concerning the origins and cultural roles of non-Western cities; the genesis and impact of colonial urbanism; the contemporary city in the Third World.

106. Geography and War. (4) Three hours of lecture per week. Geographic and geopolitical patterns of war. Centered on issues of territory and resources, topics include: patterns of war; information of war; perceptions of war; the nature of war; and human use systems; perceptions of and adaptation to natural hazards such as floods, droughts, earthquakes, tornadoes, and volcanic eruptions.

140. Analysis of Landforms. (4) Three hours of lecture per week. Geomorphic processes and the origin of landforms in extreme environments: hot arid regions, glacial and periglacial landscapes, and karst terrain. Using this framework, we will explore unique combinations of geomorphic processes acting on tectonic and structural provinces and how these changes have influenced the natural environment.

141. Paleoclimatology. (4) Three hours of lecture and two hours of discussion per week. Earth’s climatic changes have been substantial throughout geologic time, 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 past climates 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, chemical, and paleontologic characteristics of marine sediments, coral reefs, coastal sediments, lake sediments, tree rings, and ice cores. Also listed as Earth and Planetary Science C141.

142. Biology and Geomorphology of Tropical Islands. (13) Nine hours of lecture for 6 weeks: field projects for 6 weeks; three hours of lecture for 3 weeks. Natural history and evolutionary biology of island terrestrial and freshwater ecosystems; coral reefs and islands will be studied, and the geomorphology of volcanic islands, coral reefs, and reef islands will be discussed. An ecological approach to the study of interactions between the natural events and human use systems; perceptions of and adaptations to natural hazards such as floods, droughts, earthquakes, tornadoes, and volcanic eruptions.

108. Political Geography. (4) Three hours of lecture per week. The evolution and viability of selected nation states; regional blocs and spheres of influence; European imperialism and the ‘new nations’; sensitive frontiers; international cooperation, capitals, core areas, and centrifugal forces. A comparative evaluation of world power.


111. Local and Regional Transformation. (4) Three hours of lecture per week. The simultaneous transformation of localized activities, power relations, and identity. Theoretical issues pertaining to human agency and the shaping of history and the roles of places. Detailed case studies from rural and urban settings, from the past and present, from North America, Europe, and the Third World.

C112. History of Development and Underdevelopment. (4) Three hours of lecture and one hour of discussion per week. Historical review of the development of world economic systems and the impact of these developments on less advanced countries. Course is to provide a background against which to understand and assess theoretical interpretations of development and underdevelopment. Also listed as Development Studies C100.

120. The Cultures of Cities. (4) Three hours of lecture per week. We will look first at the role that cities—as economic units and cultural centers—played in the development of capitalism in the 19th century. A series of case studies, including Paris, Vienna, London, New York, and Chicago, will ground discussions about industry and finance, architecture and literature, and conspicuous consumption. We will proceed thematically, to cover the major post-war issues of the automobile and suburbia; race relations, public housing, and the ghetto; and downtown redevelopment and gentrification.

121. The Automobile and American Society. (3) Three hours of lecture per week. This course will use the development and diffusion of the automobile to examine a number of central forces shaping American society in the twentieth century: mass production, mass consumption, global restructuring, and the emergence of new kinds of urban and suburban spaces.

130. Natural Resources and Population. (4) Three hours of lecture per week. Are there enough energy, water, mineral, and land resources for the world’s population? The role of natural resources in the world economy, national development and human welfare focusing on the Third World. The origins of scarcity and abundance, population growth, and migration, hunger and poverty.

133. Islands and Oceans. (4) Three hours of lecture per week. Physical and human geography of the seas. Ocean and island ecology; ocean voyages and settlement of islands; cultural adaptations by seafaring societies; marine resources and environmental issues.

134. Natural Hazards and Problems. (4) Three hours of lecture per week. An ecological approach to the study of interactions between the natural events and human use systems; perceptions of and adaptations to natural hazards such as floods, droughts, earthquakes, tornadoes, and volcanic eruptions.

C136. Water in Terrestrial Environment. (3) Three hours of lecture per week. Infiltration, evaporation, and transpiration. Exportation of water, mineral, and land resources for the world’s population. Are there enough energy, water, mineral, and land resources for the world’s population? The role of natural resources in the world economy, national development and human welfare focusing on the Third World. The origins of scarcity and abundance, population growth, and migration, hunger and poverty.

148. Biogeography. (4) Three hours of lecture per week. Prerequisites: 1 or equivalent. Geomorphic processes and the origin of landforms in varying geographical and climatic environments.

140A. Physical Landscapes: Process and Form. (4) Four and one-half hours of lecture per week. Prerequisites: 1 or equivalent. Geomorphic processes and the origin of landforms in varying geographical and climatic environments.

140B. Physical Geography and Geomorphologic Extremes. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 140A (formerly 1401); or Geology 117; or equivalent. In this course we review the physical landscapes and surface processes in extreme environments: hot arid regions, glacial and periglacial landscapes, and karst terrain. Using this knowledge, plus an understanding of tectonics and associated geologic processes, these conditions will be reviewed as they are influenced by extreme environmental conditions.
ecosystems; environmental variability (oceanographic, climatic) and its effects; human settlement and use of reefs; human impact on reefs; conservation and management of reefs.

C152. Multicultural Europe. (4) Three hours of lecture per week. Formerly Interdisciplinary Field Studies 152. This course 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 multinational forces—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 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 political implications of nationhood and citizenship, and (2) a study of the Europeanization of culture. Also listed as History C175, Interdisciplinary Studies C145, and International and Area Studies C145.

156. Political Economy and Historical Geography of Latin America: Development. (4) Three hours of lecture per week. The political economy and historical processes of development of Latin America will be discussed. The course will emphasize the relationship between development processes, relative advantage in the context of a world market and strategic economic interests, and the distribution of wealth and power within the region. This course will also provide an understanding of the cultural and political implications of the historical and contemporary conditions that shape the spectrum of development strategies in Latin America. It will also analyze the role of Latin America in the world economy and American foreign policy.

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 C169.

C158. The Caribbean Region. (4) Three hours of lecture per week. The physical, cultural, political and socio-economic factors responsible for the diversity of the region and of peoples and landscapes. Topics include: The Caribbean Islands in the Western Hemisphere: a region which has the physical geography, climates, and biomes of the region, population, culture, and social structure. 159AC. The Southern Border. (4) Three hours of lecture per week. Prerequisites: Upper division standing. 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 testbed for such issues as free trade, immigration, and ethnic politics. Also listed as Education 166AC and Ethnic Studies 159AC. This course satisfies the American cultures requirement.

C160A. History of the U.S. Cultural Environment, 1763-1900. (3) Three hours of lecture and two hours of discussion per week. The evolution and interpretation of American landscapes—our everyday homes, highways, farms, stores, and recreation areas—with an emphasis on how to read the landscape as a record of social and cultural processes. Also listed as Environmental Design C169A and American Studies C169A.

C160B. History of the U.S. Cultural Environment, 1900-1970. (3) Three hours of lecture and two hours of discussion per week. The evolution and interpretation of American landscapes—our everyday homes, highways, farms, stores, and recreation areas—with an emphasis on how to read the landscape as a record of social and cultural processes. Also listed as Environmental Design C169B and American Studies C169B.

161. South Africa: From Apartheid to Reconstruction. (5) Three hours of lecture per week. This course encompasses the historical geography of segregation and apartheid in South Africa; the dynamics by which apartheid was undermined; and the transition from apartheid to the reconstruction of South African society and economy. The first part of the course will draw on academic and popular writings, official documents, novels, and films to trace the rise and fall of apartheid, the second part of the course focuses on struggles to achieve social justice and economic redistribution in the context of a negotiated settlement, the “government of national unity,” and the intensely competitive global economy.

163. Southeast Asia. (4) Three hours of lecture per week. Environment, culture, and development of mainland and insular Southeast Asia.

165. Africa: Ecology and Development. (4) Three hours of lecture per week. A comparative review of selected issues in the development of sub-Saharan Africa. Topics include rural development, ecological change, demography, migration, urban growth, agricultural development, and peasant economy.

166. China and Central Asia. (4) Three hours of lecture per week. Regional perspective, the physical geography, climates and economic factors responsible for the diversity of the region which has been the testing ground for such processes—on the national culture of the core countries and politics. In particular, we will look at the effects of globalization processes—due to globalization and massive migration flows—due to globalization processes. Also listed as Environmental Design C169B and American Studies C169A.

167. The Middle East. (4) Three hours of lecture per week. The human geography of the Middle East, from Egypt to Afghanistan. Physical, historical, and cultural background, perspectives on social and economic problems of individual countries and the area as a whole.

169. The New Europe. (4) Three hours of lecture per week. The idea of Europe; processes of integration and disintegration; historical geography of the formation of nations and states; environmental problems; national identity and “Europeanness”; transformation, conflict, and anxiety since 1989.

170. Special Topics in Geography. (3) Course may be repeated for credit with different topic. Three hours of lecture per week. This course is designed to provide a vehicle for instructors to address a topic with which they are especially concerned; usually more extensive than the subject matter of a regular lecture course. Topics will vary with instructor. See departmental announcements.

171. Special Topics in Physical Geography. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. This course is designed to provide a vehicle for instructors to address a topic in physical geography with which they are especially concerned; usually more extensive than the subject matter of a regular lecture course. Topics will vary with instructor. See departmental announcements.

173. Cartographic Representation. (4) Two hours of lecture and six hours of laboratory per week. Problems in the representation of quantitative and qualitative data on thematic maps.

184. Topographic Map Analysis. (4) Four hours of seminar per week. Prerequisites: 140 or equivalent. Formerly 141. The analysis of landforms portrayed by topographic maps on the standard topographic map series published by the U.S. Geological Survey.

185. Building the Digital Earth. (3) Three hours of lecture per week plus self-paced laboratories. This course is a survey of the role of various geographic information technologies in building digital representations of the earth and in supporting the development of geographic information systems. Through a series of guest lectures, faculty from several departments will describe their use of digital technologies such as geographic information systems (GIS), global positioning systems, and remote sensing to capture information about various natural and human phenomena which are distributed across the earth’s surface and to understand the processes affecting them.

187. Advanced Cartographic Methods. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: 183 or equivalent recommended. Some background using personal computers. Advanced cartographic methods will focus primarily on data acquisition, manipulation and analysis. Quantitative and qualitative data will be acquired from a variety of sources—ranging from satellite data. It will then be mapped using graphic presentation and desktop GIS software. Map design for the web will also be covered. Some local fieldwork will be required.

C188X. Geographic Information Systems. (4) Two hours of lecture, one hour of discussion, and two hours of laboratory per week. Prerequisites: Consent of instructor. Some computer experience. Formerly 188X. This course introduces the student to the rapidly expanding field of Geographic Information Systems (GIS). It addresses both theory and application and provides the student with a dynamic framework within which data and spatial data and information is gathered, integrated, interpreted, and manipulated. It emphasizes a conceptual appreciation of GIS and offers an opportunity to apply some of those concepts to contemporary geographical and planning issues. Also listed as Landscape Architecture C188X.

189. History of Geographical Thought. (4) Three hours of lecture per week. Recurring themes, problems, approaches, and controversies in the evolution of geography from ancient times, but with most emphasis on the 19th and 20th centuries. Its place in geographical thought.

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, at the instructor’s option; if 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 pass/no pass 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)

199. Directed Independent Study. (1-4) Course may be repeated for credit. Must be taken on a pass/no pass basis. Prerequisites: Senior standing. Overall GPA in major of 3.00. (F,SP)
Graduate Courses

200-208. The Geographical Point of View. (4-4) Three hours of seminar per week. Prerequisites: Required of all first year graduate students. The class has several goals. One is to give students a sound basis upon which to judge arguments. A second is to help students develop a geographical — that is, to interpret the making and meaning of our physical and human landscapes. A third goal is to introduce students to the tremendous range of geographical inquiry and what is probably the most strength of geography as a form of thought: to wit, making links across space, among peoples, and between humans and the earth. Sequence begins in the fall.

201. Philosophical and Methodological Issues in Human and Cultural Geography. (4) Three hour discussion/seminar on selected topics in historical geography. An introduction to the relations between geographic theory and wider issues in the social sciences. Emphasis on the work of recent human/cultural geographers and related work in social theory and philosophy.

202. Philosophical and Methodological Issues in Physical Geography. (4) Course may be repeated for credit. Three hours of seminar per week. This reading seminar will discuss alternative modes of scientific explanation in physical geography. It will consider the philosophical and methodological issues raised by alternative approaches, in the context both of practice in geography as a whole and of that in the natural sciences more generally. Much attention will be paid to the relationship between physical and human geography, the prospects for a unitary discipline, the implications of environmental change (both natural and man-induced).

203. Nature and Culture: Social Theory, Social Practice, and the Environment. (4) Three hours of seminar per week. Prerequisites: Required of all graduate students directly engaged in field studies. 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 planetary scale, or (2) integrative in nature (meaning they tie together disparate elements to form a coherent view of the operation of earth systems).

204. Geographic Research Methods and Theories. Emphasis on field research and historical and theoretical approaches to the study of geographic agents and as participants in climate change. Also listed as Earth and Planetary Science C242.

211. Alternative Seminar in Historical Geography. Three hours of seminar plus one hour of consultation per week. Research seminar on selected topics in historical geography. Course may be repeated for credit. Two hours of seminar and one hour of consultation per week. Research seminar on selected topics in historical geography.


213. Nationalism, Identity, and Territoriality in Europe. (4) Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. Research seminar on selected topics in the geography of Latin America.

214. Development Theories and Practices. (3) Prerequisite: Consent of instructor. Maximum enrollment 25. This seminar will explore the possible social and economic impacts of global change, focusing on ecocultural and economic tradeoffs associated with the following human responses to global change: adaptation, prevention, and no response. Emphasis will be placed on developing predictive models of how the Earth system (including humans) will respond to global change. Also listed as Energy and Resources Group C291, Integrative Biology C272, and Environ Sci, Policy, and Management C212.

215. Directed Field Studies. (1-6) Prerequisites: Consent of instructor. Maximum enrollment 25. Prerequisites: Consent of instructor. Maximum enrollment 25. Prerequisites: Consent of instructor. Maximum enrollment 25. Prerequisites: Consent of instructor. Maximum enrollment 25. Prerequisites: Consent of instructor. Maximum enrollment 25. This seminar will explore the possible social and economic impacts of global change, focusing on ecocultural and economic tradeoffs associated with the following human responses to global change: adaptation, prevention, and no response. Emphasis will be placed on developing predictive models of how the Earth system (including humans) will respond to global change. Also listed as Energy and Resources Group C291, Integrative Biology C272, and Environ Sci, Policy, and Management C212.

220. Directed Dissertation Research. (1-12) Prerequisites: Open to students not yet advanced to candidacy. Directed dissertation research under the advisement of a faculty consultant. Three hours of seminar and one hour of consultation per week. Research seminar on selected topics in maritime geography.

221. Departmental Research Seminar. (1) Course may be repeated for credit. One hour of lecture per term. Research seminar on selected topics in the geography of Latin America.

225. Seminar in Sociology of Forest and Wildland Resources. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly 250. Individual projects and group discussions concerning social constraints on resource planning and management. Application of sociological theories to problems of managing wildland ecosystems. Students will examine topics of individual interest related to management of wildland uses. Enrollment limited. Also listed as Environ Sci, Policy, and Management C255.

226. Topics in Political Geography. (4) Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. Research seminar on selected topics in urban geography.

227. Topics in Economic Geography. (4) Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. Research seminar on selected topics in economic geography.

228. 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.

229. Topics in Political Geography. (4) Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. Research seminar on selected topics in political geography.

230. Directed Dissertation Research. (1-12) Course may be repeated for credit. Must be taken on a satisfactorily/unsatisfactory basis. An informal seminar for the presentation of graduate research in progress.

231. Geography Colloquium. (1) Course may be repeated for credit. One hour of lecture per term. Research seminar on selected topics in the geography of Latin America.


233. Nationalism, Identity, and Territoriality in Europe. (4) Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. Research seminar on selected topics in the geography of Latin America.

234. Ecological and Social Dimensions of Global Change. Three hours of seminar per week. Prerequisites: Consent of instructor and one-half hour of discussion. Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. Research seminar on selected topics in global change.

235. Topics in Cultural 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 cultural geography.

236. 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.

237. 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.

238. Topics in Political Geography. (4) Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. Research seminar on selected topics in political geography.

239. Topics in Historical 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 historical geography.

240. Advanced Landforms Analysis. (4) Three hours of seminar per week. Prerequisites: 140 or equivalent. Problems and methods of geomorphic analysis.

241. 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, global flow, and response of ice sheets and glaciers. We will use the field as a guide for techniques and capabilities of participants in climate change. Also listed as Earth and Planetary Science C242.

242. 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 planetary scale, or (2) integrative in nature (meaning they tie together disparate elements to form a coherent view of the operation of earth systems).

244. Ecological and Social Dimensions of Global Change. Three hours of seminar per week. Prerequisites: Consent of instructor and one-half hour of discussion. Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. Research seminar on selected topics in global change.

245. Topics in Cultural 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 cultural geography.

246. 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.

247. 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.

248. Topics in Political Geography. (4) Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. Research seminar on selected topics in political geography.

249. Topics in Historical 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 historical geography.

250. Topics in Social Geography. (4) Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. Research seminar on selected topics in social geography.

251. Foundation of schools and “circles.” Recurring arenas of change research, with an emphasis on important ad-
Department Overview

The Department of German offers undergraduates 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 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 teaching assistants. Seminars in applied linguistics and second-language acquisition provide a theoretical and practical foundation for teachers.

The curriculum of Dutch Studies focuses upon the language, literature, and culture of The Netherlands and Flanders.

The Major

Lower Division. German 1, 2, 3, 4, or their equivalent.

Upper Division. Ten upper division courses totaling 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 departmental booklet; German 100 or 101 is prerequisite for these courses. Two courses may be taken from a list of elective courses except outside the department. (The list is available in the German Department.) Courses must be taken in the literature and culture of at least two different centuries; consult the major adviser and an undergraduate assistant 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 assistant.

Honors Program. A grade-point average 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: Any course in the 195 series and an honors thesis (H196). 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 two courses in which the knowledge of German is required (see the course descriptions that follow or the departmental booklet for current information). One affiliate course from another department or a course in Dutch from the German Department 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 Program

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.

1. 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 German Department. An examination, involving interpretation of a literary text, normally is taken in the third semester.

2. 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 approaches as discourse grammar, linguistic field work, and semiotics. Students have to complete at least 37 units, 26 of which must be in graduate courses. A knowledge of Middle High German as well as proficiency in oral and written New High German are required. Students are granted the degree upon passing a comprehensive examination.

For more detailed information on the M.A. program in literature and linguistics, students should consult the German Department’s “Information Sheet for Graduate Students.”

The Ph.D. Program: The German Department offers a Ph.D. in both German 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.

1. 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 literary, cultural, and intellectual history; a working familiarity with various critical approaches to these fields, and the ability to pursue original research and to present 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, language, 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, expansion of interdisciplinary horizons, and a beginning familiarity with the workings of a doctoral dissertation are goals at this level. Students must also acquire competence in an outside field complementary to the major field of concentration in German literature and culture; the outside field is tested in the qualifying examination.

Language requirements: a reading knowledge of two foreign languages other than German, or advanced cultural competence in one foreign language other than German.

2. Doctor of Philosophy: Linguistics. An M.A. in German linguistics or its equivalent is a prerequisite for admission. Students are expected to consult with their graduate adviser in order to set up their best plan of study for the Ph.D. For their dissertation research, students may choose to con-
German

Lower Division Courses

1. Elementary German. (5) Five hours of lecture per week. Four of the weekly class meetings will be conducted in German, with one lecture on language and culture in English. Students develop the basic elements of communicative competence in both spoken and written language within a cultural frame work. (F,SP) Staff

2. Elementary German. (5) Five hours of lecture per week. Prerequisites: 1 or equivalent. Students continue to develop the basic elements of communicative competence in both spoken and written language. (F,SP) Staff

3. Intermediate German. (5) Five hours of lecture per week. Prerequisites: 2 or equivalent. This course is designed to refine students' oral communicative competence and their ability to read and write. General review of grammar. (F,SP) Staff

4. Advanced German. (5) Five hours of lecture per week. Prerequisites: 3 or equivalent. Students acquire oral communicative strategies to function in socially appropriate ways in authentic situations of language use. They learn 1) to read and understand literary and non-literary texts at multiple levels of interpretation and 2) to write in culturally appropriate ways. (F,SP) Staff

4T. Theater Workshop. (5) Combination of class meetings and workshops for minimum of five hours per week. Prerequisites: 3 or equivalent. Theater option of German 4. Discussion of postwar drama and drama theory, including the production of a major play, with instruction, readings and preparation in German. Staff

R5A-R5B. Reading and Composition. (4)(4) Three hours of lecture per week. Prerequisites: Subject A or examination for SA. Any A-level course for SB. Formerly 5A. This course offers a survey 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

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 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 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. (F,SP) Staff

39. Freshman Seminar. Course may be repeated for credit. Three hours of lecture/discussion per week. No knowledge of German required. (F,SP) Staff

40. German Conversation. (2) Course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisites: 4 or equivalent. Formerly 102A-102B-102C. Not open to native speakers. (F,SP) Staff

Upper Division Courses

Unless otherwise indicated, upper division courses require knowledge of German.

100. Introduction to Reading Culture. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. The course is intended to acquaint students with selected works from German cultural history and to familiarize them with various methods of interpretation and analysis. Required of all German majors. (F,SP) Staff

101. Language and Text I. (3) Three hours of lecture/discussion per week. Prerequisites: 4 or equivalent. Close reading of texts of literary or cultural significance. Emphasis on idiomatic uses of German in oral and written expression. No midterm or final examinations. Required of all German majors. (F,SP) Staff

102. Language and Text II. (3) Three hours of lecture/discussion per week. Prerequisites: 101 or equivalent. Systematic study of elements of style and discourse structures in spoken and written texts. Intensive writing practice and critical reading of texts. No midterm or final examinations. Required of all German majors. (F,SP) Staff

104. 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 and writing German. We will work with texts that were particularly influential in Germany during the first decades of the 20th century, regardless of when they were written. Segments of philosophical and political texts in their historical settings. (SP) Weisinger

108. Literary Translation. (3) Three hours of lecture per week. Prerequisites: Knowledge of German required. Major texts from the 18th through the 17th centuries (F,SP) Tennant, Largier

110. The Literature of the Middle Ages. (3) Three hours of lecture/discussion per week. Introduction in modern German or English translation to major literary monuments of the Hohenstaufen period. Intended for undergraduates with no knowledge of Middle High German. (F,SP) Tennant, Largier

120. Enlightenment and Sturm und Drang. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. Major texts from the 18th and 19th centuries and its theory in terms of the relationships between literature and society, and its psychological and political significance. Staff

121. Lessing. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. A study of his contribution as playwright, moralist, and philosopher. An introduction to 18th-century trends in philosophy and literary theory will precede the analyses of selected texts. Staff

122. Dramas of the Family. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. Middle-class tragedy of the 18th and 19th centuries and its theory in terms of the relationships between literature and society, and its psychological and political significance. Staff

123. From 1800 to the Present. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. The social, political, and historical background to German literature since the French Revolution, Seeba

130. Classicism. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. Problems of Weimar Classicism, particularly in the light of contemporary discourse, will be discussed. Traditional interpretations will be weighed against contemporary readings of the major works of the period. Staff

131. Goethe. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. An introduction to Goethe’s prose, drama, and poetry. Staff

132. Schiller. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. A study of Schiller’s major dramas, Some attention given to dramatic theory, prose, and poetry. Staff

140. Romanticism. (3) Three hours of lecture/discussion per week. Literature, philosophy, and aesthetics of the Romantic period. Staff

141. German Literature and the French Revolution. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. This course will reflect recent attempts to redefine the trajectory of German literature by taking account of the central importance of the German response to the Revolution for the development of Weimar Classicism and early Romanticism. We will also look at the politically changed reception of German Classicism in...
143. Friedrich Nietzsche: The Unmitigable Philosopher. (4) Three hours of lecture and one hour of discussion per week. This course introduces students to the life and thought of Nietzsche and issues present in Nietzsche’s writings. Nietzsche is one of the most challenging and controversial philosophers in the German tradition, but close examination of his major writings in the context of his times should shed new light on what motivated him and what he actually advocated. The course will focus not only on philosophical problems that surface in his writings, but also on cultural, social, and political issues that Nietzsche frequently discusses. (F,SP) Holub

145. Jewish Writers. (3) Three hours of lecture/discussion per week. Formerly 160. This course explores problems of German-speaking Jews trying to come to terms with the dominant German (or Austrian)-European culture from their emancipation from the ghetto in the 17th and 18th centuries to their expulsion or termination in the Nazi era. We will examine the texts of Jewish writers that concern Jewish-German/Austrian identity and nationality and try to understand them as socio-historic, cultural documents and literary or aesthetic writings. Texts will include: Gluckl of Hameln (Memoir) Moses Mendelssohn, Heinrich Heine (The Rabbi of Bacharch), Karl Marx, (On the Jewish Question), Ernst Toller (The Jewish State, Freedom and Monotony), Arthur Schnitzler (Professor Bernhardi and/or The Way into the Open), Else Lasker-Schuler’s poetry, Ernst Toller (I Was a German), Franz Kafka (language of the underdogs, Joseph and the Jewish Mouse Folk), Peter Weiss (The Investigation), Stefan Zweig (The World of Yesterday). (SP) Staff

148. Topics in Narrative. (3) Course may be repeated for credit as topic varies. Three hours of lecture/discussion per week. Analysis of German nar- rative forms. Topic varies. (F,SP) Staff

150. Introduction to Contemporary Germany. (3) Three hours of lecture/discussion per week. Introduction to the social, political, and historical background of the Federal Republic of Germany today. Open to all undergraduates with an interest in contemporary Germany and particularly intended for students who will participate in the Education Abroad Program to Goettingen in the following year. (F,SP) Staff

151. 18th- to 20th-Century German Poetry. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. Representative poets of the 18th- to 20th-Centuries will be studied closely. Methodological questions regarding the interpretation of poetry in general will also be discussed. Staff

152. Modern Literature. (3) Three hours of lecture/discussion per week. Introduction to philosophical, ideological, and aesthetic trends at the turn of the century. Analysis of literary texts by Th. Mann, Franz Kafka, Bertolt Brecht, Stefan Zweig, and Hermann Hesse. (SP) Staff


155. Kafka and Modernism. (3) Three hours of lecture/discussion per week. A careful study of Kafka’s writings that will consider them in their social, historical, and cultural contexts and will focus on a number of significantly different interpretive approaches to his works. Staff

156. Brecht. (3) Three hours of lecture/discussion per week. An introduction to Brecht’s work. Staff

157. Marx, Nietzsche, Freud. (3) Three hours of lecture/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 19th century. Special emphasis will be placed on several general works in which problems of history, ideology, values, and methodology are considered. Lecture and readings in English. (F,SP) Staff

159. Marx and the Marxist Tradition. (3) Three hours of lecture/discussion per week. Course includes reading, discussion and research of Karl Marx’s writings of both the early and late period. Selected readings by Friedrich Engels, Georg Lukacs, Antonio Gramsci, Lenin, Wilhelm Reich, Theodor Adorno, Max Horkheimer, Ernst Bloch, Walter Benjamin, Georg Habermas, and others. Also listed as Sociology C102A. (F,SP) Holub

161. Viennese Literature and Culture at the Turn of the Century. (3) Three hours of lecture/discussion per week. This course will focus on literature, psychology, and philosophy of the turn of the century. Staff

162. Mastering the Past: Postwar Reflections. (3) Three hours of lecture/discussion per week. The objective of this course is to examine various aspects of postwar Germany, both East and West, as it attempted to come to terms with its legacy and the attendant problems of National Socialism. The assignments (all of which are in English) will focus on a few key aspects of this process: 1) exemplary philosophical responses (Theodor Adorno, Martin Heidegger, Martin Buber); 2) literary responses (drawn from the works of Heinrich Boell, Günter Grass, Rolf Hochhuth, Peter Weiss, Christa Wolf); 3) film (Rainer Werner Fassbinder, Edgar Reitz, Helma Sanders-Brahms, Wolfgang Staudte); and 4) controversies in political culture (de-nationalization, theories of fascism, Bitburg, historians’ debate, unification, post-unification). Assignments: a midterm and a final examination. (F,SP) Holub

163. “Väterliteratur”: The Quest for Identity. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. Studies in the discourse of memory and historical identity, with emphasis on literary texts written around 1980 in which sons and daughters explore and question their father’s involvement in the Third Reich. Texts and discussions in German. (SP) Seeba

165. Women’s Writing and Enlightenment. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. Studies in the discourse of memory and historical identity, with emphasis on literary texts written around 1980 in which sons and daughters explore and question their father’s involvement in the Third Reich. Texts and discussions in German. (SP) Seeba

166. Feminist Perspectives in Literature. (3) Course may be repeated for credit. Three hours of lecture/discussion per week. For specific topic contact German department. (F,SP) Staff

167. Cultural Criticism. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. The cultural criticism of Friedrich Nietzsche, Sigmund Freud, and Hannah Arendt will be examined. The implicit criticism in works by such authors as Thomas Mann, Franz Kafka, Lasker-Schüler, and Thomas Bernhard will be considered. Notions of the subconscious, identity formation, and societal responsibility will receive particular attention. Texts and discussion in German. (F) Kudszus

168. Yiddish Literature and Culture. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of Yiddish is highly recommended. A survey of a variety of 19th- and 20th-century Yiddish texts written in Eastern Europe and America, this course will focus on 1) the culture of the Eastern European “shetel” (village) as seen through visual and the fine arts; 2) a new cultural life and literature which develops in the latter part of the 19th century, with migration to cosmopolitan areas where other modes of life and other cultures predominate; and 3) transfor-

170. History of the German Language. (3) Three hours of lecture/discussion per week. Designed for under-graduate and graduate students interested in the history of the language of the newly unified Germany, which transverses a rich linguistic legacy from the Lay of Hildebrand, through Luther and Grimm, to Grass and Der Spiegel. Discussion, via linguistic principles, of how the language processes and accommodates the development of the German language, as well as its interchange over time with closely and remotely related languages such as English and Russian. (F) Rauch

171. German Language Change and Societal Change. (3) Three hours of lecture/discussion per week. Designed for under-graduate and graduate students interested in this course studies the mechanisms of language change and growth as evidenced in present and past German language data. Causality of change, in particular catalysts such as the media, demographics/social networks, commerce, government/politics, the law, the arts, education, theology, science/technology, travel. (R) Rauch

174. Introduction to the Linguistic Study of Ger-

mans. Three hours of lecture/discussion per week. A basic overview of the field of German linguistics, including modern German in its various aspects, the historical development of language, and concluding with an examination of the modern linguistic enterprise. Designed for undergraduates and graduates. (SP) Rauch

175. Undergraduate Seminars. Three hours of seminar per week. Prerequisites: 100. (F)

175B. 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 Brekkinmann. A 20-page research paper will be part of the requirements for this course. (F)

175C. Heinrich Heine. (3) Prerequisites: 100 or equivalent and knowledge of German. Focus for this course will be Heine’s poetry from his earliest romantic verses in Buch der Lieder through the verses written in his Paris exile (Verschenkungen, Deutscheland, Ein Winternachmachen, and Atta Troll) to his last poetic works Romanzero and Gedichte 1853 und 1854. (F,SP) Holub

179. Special Topics in German. (3) Course may be repeated for credit as topic varies. Three hours of lecture/discussion per week. Prerequisites: Knowledge of German may be required depending on topic. Topics will vary from semester to semester. See departmental office for information. Reading and screening time may be required for film topics. (F,SP) Staff

180. From Expressionism to Social Realism; Ger-
mans Cinema of the 20s. (4) Three hours of lecture and two hours of film screening per week. A comparative and interdisciplinary approach to the history of early German film between 1920 and 1933, designed to introduce the student to the analytical study of film in general. We will closely analyze the major films of the period and relate them to Weimar culture and society. Films have English subtitles. (SP) Kudszus

181. Films of the Third Reich. (4) Three hours of lecture and two hours of film screening per week. A study of the function of propaganda in the films made under Hitler. Using fiction and documentary films, we will try to develop some understanding of the concepts of fascism as art. We will also examine the social context of film art in the Third Reich and analyze how German post-war films have depicted the Hitler period. Films have English subtitles. (SP) Kudszus

182. German Cinema in Exile. (4) The course will attempt to continue their cultural pursuits. (SP) Kudszus
183. New German Cinema: German Film After 1952. (4) Three hours of lecture and one hour of film screening per week. This course will examine selected films by Straub, Herzog, Fassbinder, Wenders, Syberberg, and lesser-known filmmakers in terms of their distinct visual styles, narrative principles, and thematic preoccupations. Discussions of modernism and post-modernism will help place these films in larger contexts. Films have English subtitles. Kaes

185. Representations and Memory of the Holocaust in Film. (4) Three hours of lecture per week and three hours of film screening per week. Because of its enormity, the Holocaust has often been viewed as an event that defies representation, yet it continuously has been the subject of films in the postwar period. Focusing primarily on films produced in the United States, we will examine films from the 1940s to the 1990s for their representational strategies and their dealings with memory and commemoration. (F.Sp) Holub

195. Research Seminar for Undergraduates. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Knowledge of German required. One course offered under this topic is required of all participating in the departmental Honors Program. For specific topic contact departmental office. (F) Staff

H196. Honors Studies in German. (2-4) Prerequisites: One of the 196 courses. Supervised independent study and research course for honor students who would like to write their theses for completion of the requirements for the Honors Program. (F.Sp) Staff

198. Directed Group Study. (2-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Group study of selected topics which will be determined for the individual course. Staff

199. Supervised Independent Study and Research. (2-4) Individual conference. Must be taken on a passed/not passed basis. Prerequisites: Open to students who have completed at least 15 units of upper division German with an average no less than B. Supervised independent study and research. (F.Sp) Staff

Graduate Courses in Literature

Introductory

200. Proseminar in German Literature. (4) Two hours of seminar and one hour of tutorial per week. The seminar will give a brief introduction to the history of German literature, drawing attention to bibliographical and research tools, dwell on problems relating to critical editions of modern authors, familiarize students with Germanistik as a profession in the U.S.A., and focus upon literary theory. Required of all M.A. candidates. Staff

201. Major Periods in German Literature. (4) Three hours of lecture/discussion per week. Designed expressly for M.A. candidates. Final exam, no paper.

20A. Literature of the Middle Ages. (4) Survey of medieval German literature that concentrates on monographs of the Hohenstaufen period but also includes representative texts 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

20B. 16th and 17th Century. (4) Recommended for M.A. candidates. (F) Tenant, Largier

20C. 18th Century. (4) An introduction to major works of late Enlightenment, Sturm and Drang, and Classicism to Schiller's death. Staff

20D. 19th Century. (4) A study of major texts from Novalis to Fontane to explore the changing functions of literature, its ideological implications and social significance within 19th century German thought. (SP) Seeba

20E. 20th Century. (4) A critical overview of the major literary research and important developments of the modern period from about 1910 to the present. We will explore how social and philosophical forces are inscribed in representative literary and theoretical texts of that period and discuss the changing status and social function of literature in Expressionism, Dada, Fascism and Exile, after 1945 and in post-modernism. Kaes

Literary History

205. Studies in Medieval Literature. (4) Two hours of seminar and one hour of tutorial per week. Prerequisites: 196 or 203. Tennant, Largier

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

208. Studies in the 17th Century. (4) Two hours of seminar per week. A study of a series of topics dealing with genres, authors, 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

210C. Storm and Stress and Literary Jacobinism. (4) A comparison of the two literary movements in the late 18th century will be discussed 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) Staff

212B. Germany and the French Revolution. (4) The French revolution as the defining series of historical events for the seminar period of Weimar Classicism (Goethe, Schiller), philosophical Idealism (Kant, Fichte), and early Romanticism (Schlegel, Tieck, Wackenroder). Cultural texts will be read in the context of journalistic responses to the Revolution and travel reports of German visitors to France. Wilson

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. Three seminars. Early Goethe. (4) Concentration on the works of Goethe’s Sturm und Drang period and Faust I. Various interpretations of the major works of the author will be examined in the course of research in this period. (F.Sp) Weisinger

234C. Goethe and the Powerless. (4) An examination of Goethe’s depictions and rejection to marginalized groups: the lower classes, women, Jews, and oppositional intellectuals. Fictive as well as official and autobiographical writings will be read. Wilson

238. Hoelderlin. (4) Two hours of seminar per week. Kudszus

241. Heinrich Heine. (4) Three hours of seminar per week. A study of Heine’s works in their political and social contexts. (SP) Holub

249. Franz Kafka. (4) Three hours of seminar per week. Kudszus

252. Nietzsche. (4) An examination of Nietzsche’s most important texts and to examine the variety of ways he has been read, especially during the past two decades or so. Holub

Theory

253. Seminar in Criticism and Theory. (2) Seven hours of seminar for four weeks. Topics vary semester to semester. Contact the German Department for further information. (F.Sp) Staff

C254. Principles in Language Learning and Teaching. (2-4) Two hours of seminar/discussion per week. Formerly 254. The purpose of this seminar is to give graduate students a thorough understanding of the nature of linguistic, psychological, and socio-cultural processes involved in learning a foreign language and to make them aware of the options that teachers have to influence these processes. 1) Theories and methods. 2) Socialization and literacy in a second language. 3) Review of currently suggested practices for teaching the four skills and culture. Open to all language teachers regardless of foreign language taught. In English with occasional German readings. (F) Staff

255. Interpretation and Criticism of Poetry. (4) Three hours of seminar per week. (F) Kudszus

260. 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

257. The Future of the Past: The Role of History in Cultural Poetics. (4) Course may be repeated for credit. Two hours of seminar and one hour of tutorial per week. Dealing with concepts of representation both historically and theoretically, the course is designed to introduce graduate students to the notions of “historicity” of aesthetic discourse and of “aestheticity” of historical discourse in the context of German intellectual history, with special emphasis on the narrative of the past and the projection of the future. (F.Sp) Seeba


261. Myth and Metaphor: Patterns of Imagination. (4) Two hours of seminar and one hour of tutorial per week. Discussion of theories of myth and metaphor from Friedrich Schlegel to Hans Blumenberg and of the role of mythological patterns (e.g., Ulysses, Oedipus, Cassandra, Medea, Siegfried, Hermann, Wilhelm Tell, Rudolf von Habsburg) in German literary and intellectual history. Staff

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

264. Psychoanalytic Readings. (4) Three hours of seminar per week. The seminar will explore both works by psychoanalysts such as S. Freud and a variety of psychoanalytic approaches to literature. (F.Sp) Kudszus

265. Film Theory: Historical and Systematic Perspectives. (4) Two hours of lecture/discussion plus one hour of tutorial per week. Prerequisites: 200 or formerly 203. (F.Sp) Tenent, Largier

268. Aspects of Literary and Cultural History. (4) Three hours of seminar per week. A comparison of literary and cultural developments in Germany and the United States. Emphasis is placed on individual research designed to develop teaching materials. Staff

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 a broader theoretical framework. (SP) Rauch

273. Old High German. (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 eleventh century within the framework of current linguistic methods. Rauch
278. History of the Dutch Language. (4) Two hours of lecture and one hour of tutorial per week. The prehistory, emergence, development of Netherlands, and its filiation with English and German. See also Dutch 107. Shannon

280. North Sea Germanic. (4) Three hours of seminar and discussion of poems and prose texts in the Ingwaenic languages (broadly construed) not covered elsewhere: Old Low Franconian, Middle Dutch, Old Frisian, Middle Low German. (F.SP) Shannon

282. Old Saxon. (4) Three hours of lecture/discussion per week. Study of the most provocative of the major Germanic languages in terms of structural identification. The literary and ethnographic setting of the Heil and its shared isogrammar. Rauch

285. Approaches and Issues in the Study of Modern German. (4) Two hours of seminar and one hour of tutorial per week. Prerequisites: 103. A survey of relevant contemporary issues and topics in linguistic research on the structure of German. 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 departmental office. Staff

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 analyses as applied to the German language. It will introduce basic concepts and means of morphological analyses, as well as study and apply various theories of word structure to German. The primary concern will be with synchronic analyses of modern German word formation, but questions of a diachronic nature as well as ones about inflection will also be discussed. (SP) Shannon

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 explanatory potential. Typological comparison, especially with English. Staff

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. Staff

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: Modern German with Middle English and 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) Shannon

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. Rauch

Group and Individual Study

298. Directed Group Study. (2-8) Course may be repeated for credit. Two hours of seminar and one hour of tutorial per week. 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 postgraduate 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. (4-8) Course may be repeated once for credit. Individual conference. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: M.A. in German. Individual study in consultation with graduate adviser to provide an opportunity for Ph.D. candidates to prepare for the qualifying examination. (F.SP)

Courses in the Teaching of German

301. The Teaching of German in College: First Year. (3) Two hours of seminar per week. Prerequisites: Graduate standing. Required of all graduate student instructors, this course provides instruction on the theory and practice of foreign-language teaching and learning. (F) Newton

302. The Teaching German in College: Advanced First Year. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Graduate standing. Required of all graduate student instructors. This course continues to provide instruction on the theory and practice of foreign-language teaching and acquisition. (SP) Newton

Yiddish

Lower Division Courses

1. Yiddish. (5) Five hours of lecture/discussion per week. This introductory Yiddish course focuses on the development of communication skills in reading, writing, and speaking. The linguistic material is presented in the context of Yiddish culture. (F) Katz

2. Yiddish. (5) Five hours of lecture/discussion per week. Prerequisites: 1 or equivalent. This course builds on the foundation established in 1, further developing communication skills in reading, writing, and speaking. More advanced linguistic material is presented in the context of Yiddish culture. (SP) Katz

Dutch

Lower Division Courses

1. Elementary Dutch. (5) Five hours of lecture and one hour of laboratory per week. Beginner’s course. (F) Van Deusen-Scholl

2. Elementary Dutch. (5) Five hours of lecture and one hour of laboratory per week. Prerequisites: 1 or equivalent. Review of Dutch grammar, written exercises, and an introduction to Dutch literature. (F) Staff

125. Conversation and Composition. (3) Three hours of lecture per week. Prerequisites: 2 or equivalent. Essay and research course for honors students. (F,SP) Staff

140. Topics in Dutch Literature. (3) Course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisites: 110 or consent of instructor. Designed to provide in-depth study of Dutch texts from Middle Dutch to contemporary literature. (SP) Staff

160. Literature of the Lowlands in English Translation. (3) Course may be repeated for credit as topic varies. Three hours of lecture/discussion per week. Study of the major contemporary Dutch and Flemish writers and their works. (F,SP) Staff

161. Masterpieces in Dutch and Flemish Literature in English Translation. (4) Three hours of lecture and one hour of consultation per week. In this course the most celebrated and critically acclaimed literary works from the Netherlands and Flanders have been studied in English translation. The works consist primarily of novels from the Middle Ages to the modern period, with special emphasis on the latter. (F,SP) Staff

162. The Modern Short Story in Holland and Flanders in English Translation. (4) Three hours of lecture plus one hour of consultation per week. In this course the modern short story will be studied in English, drawing from the work of writers between the 1950s and 1990s. Special emphasis will be placed on post-war Dutch literature. Staff

163. Women Writers in the Netherlands and Flanders in English Translation. (4) Three hours of lecture and one hour of consultation per week. The Netherlands has a long tradition of good women authors, many of whom have been on the vanguard of social change. In this course there will be equal emphasis on poetry and prose from 17th-century mystics to modern feminist writers. (F,SP) Staff

164. The Indonesian Connection: Dutch Literature about the Indies in English Translation. (4) Three hours of lecture and one hour of consultation per week. Post-War Dutch literature is replete with works dealing with the Netherlands, by both victims and perpetrators. The course will focus on literary as well as historical documents, examine the history of anti-Semitism in the Lowlands, and compare a number of literary genres from the Diary to e-documents and fiction. (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, including both the Netherlands and Belgium. Through reading, audiovisual materials, the World Wide Web, guest lectures, and discussions, we will cover the major social, political, and cultural aspects of modern Dutch society. The course is organized around five major themes: water management and environmental issues; language and education; art, literature, and culture; politics, religion, and social welfare; and social issues. (SP) Van Deusen-Scholl

190. Senior Thesis. (4) One 2-hour consultation per week. Major research paper in the areas of Dutch literature, culture, or the area of linguistics. Required of all majors. (F,SP) Staff

H196. 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 seminar 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 satisfactory/unsatisfactory basis. Prerequisites: Overall G.P.A. of 3.0. Enrollment is restricted by regulations in General Catalog. (F.SP) Staff

Graduate Courses

240. Graduate Readings in Dutch. (4) Course may be repeated for credit. Individual conference. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Overall G.P.A. of 3.0. Enrollment is restricted by regulations in General Catalog. (F.SP) Staff

280. Middle Dutch—Language and Text. (4) Three hours of lecture per week. A research seminar in the language of Middle Dutch in comparison to Middle Dutch
Health and Medical Sciences Program

Graduate School of Public Health

Program Office: 570 University Hall, (510) 642-5479
Director: W. Thomas Boyce, M.D.

Assistant Adjunct Professor
Jeffrey Burack, M.D.

Visiting Professor
Jennifer Brecikler, Ph.D.

Program Overview
UC Berkeley-UC San Francisco Joint Medical Program. A five-year program leading to the M.S. in Health and Medical Sciences from UC Berkeley and the M.D. from UC San Francisco. Berkeley awards the master’s degree upon the successful completion of the first three years of work and UC San Francisco awards the medical degree after satisfactory completion of the fourth and fifth years. The master’s program is interdigitated with the required preclinical science courses during the first three years requiring at least 20 units of academic course work and a thesis. Students are expected to acquire a scholarly expertise with a selected area of interest related to health and mastery of preclinical sciences. Students selected for this program must meet the rigorous academic requirements for entrance into medical school. The selection process screens for students who have a strong interest in health care beyond the purely medical and who prefer a small group process model for learning.

Genetic Counseling Program. Genetic counseling involves assisting individuals and families to understand relevant information, make informed decisions, and deal with the emotional and social consequences of the occurrence or risk of occurrence of a genetic disease or birth defect. Genetic counselors usually work as members of a medical team in a general genetics clinic, prenatal diagnosis clinic, or prenatatal screening program. The two-year program leads to an M.S. Didactic courses include medical and clinical genetics; clinical techniques in biochemistry, cytogenetics, and DNA technology; relevant aspects of fertility and embryology; counseling techniques and related aspects of psychology; ethics; and community resources and education.

Genetic counseling prerequisites are one year’s direct counseling experience and the following courses: biochemistry, human genetics, statistics, and two upper division psychology courses, one of which is developmental psychology. The courses HUMS 231A-231B, HUMS 232A-232B, HUMS 245A-245B, HUMS 290A-290B, HUMS 475, HUMS 485, and HUMS 497A-497B, described below, comprise the genetic counseling curriculum.

Fieldwork placements in both years provide on-site experience that is closely integrated with didactic material through courses and individual supervision.

Admissions. Admissions requirements of the two graduate programs differ. As a minimum, applicants must be eligible for admission to the University in graduate standing, with an undergraduate upper division grade-point average of at least 3.0, along with a bachelor’s degree from an accredited college or university. Applicants to the Genetic Counseling Program must take the Graduate Record Examination. Applicants to the Joint Medical Program must have fulfilled the standard prerequisites, male genitale, rectal exam, ears, nose, throat, thyroid, and skin are covered this semester. Individual preceptorships provide clinical experience for students to integrate history and each newly learned organ system. (F) McIvor, Swartzberg

Graduate Courses
205. The Patient Encounter 1. (2) Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Concurrent enrollment in 206A, 206B, 206C or 206D; graduate standing in HMS Joint Medical Program. Students are taught how to examine the human body by an organ system approach. The lecture explains how this is performed; the laboratory experience is with patients on hospital wards, supervised by an instructor. The heart, lungs, and eyes are covered this semester. Individual preceptorships provide clinical experience for students to integrate history and each newly learned organ system. (F) McIvor, Swartzberg

205B. The Patient Encounter 3. (1) Three hours of lecture/laboratory offered alternate weeks. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Concurrent enrollment in 206A, 206B, 206C or 206D; graduate standing in HMS Joint Medical Program. Students are taught how to examine the human body by an organ system approach. The lecture explains how this is performed; the laboratory experience is with patients on hospital wards, supervised by an instructor. The heart, lungs, and eyes are covered this semester. Individual preceptorships provide clinical experience for students to integrate history and each newly learned organ system. (F) McIvor, Swartzberg

205C. The Patient Encounter 4. (1) One and one-half hours of lecture and one and one-half hours of laboratory for twelve weeks. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Concurrent enrollment in 206A, 206B, 206C or 206D; graduate standing in HMS Joint Medical Program. The nervous system, female genitalia, rectal exam, ears, nose, throat, thyroid, and skin are covered this semester. Individual preceptorships provide clinical experience for students to integrate history and each newly learned organ system. (F) McIvor, Swartzberg
205D. The Patient Encounter 5. (1) One and one-half hours of lecture and one and one-half hours of laboratory for twelve weeks. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Concurrent enrollment in 250A, 250B, 250C or 250D; graduate standing in HMO Joint Medical Program. Under supervision, students perform a complete history and physical exam on hospitalized or clinic patients six times over the twelve-week period. They verbally present the patients to the class and instructor six times during the semester. These presentations are critiqued and the tools to effectively present cases are taught. (F) McVicar, Swartzberg

206A-206D. Introduction to Clinical Medicine: Basic Principles and Processes, (4.5-4.5-4.5-4.5) Six hours of lecture/discussion per week. Prerequisites: Graduate standing in HMO Joint Medical Program. A four-semester sequence introducing basic principles of clinical medicine taught by organ system and ending in integrated overview applying the basic principles to specialty areas. Instruction is case-based, combining didactic, problem-based and interactive teaching. (F,SP) Swartzberg, Stevens

208. Introduction to Clinical Psychiatry. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Graduate standing in Health and Medical Sciences Joint Medical Program. Students will be taught specific skills of psychiatry, along with a body of knowledge that is at least as meaningful as it relates to the health and disease of other organ systems in the individual. Under supervision, students will interview psychiatric patients and present results in written form. (F) Katz

209A-209D. Principles of Human Pathology. (2,2.5,2.5,2.5) Two hours of lecture per week and three hours of laboratory every two weeks. Prerequisites: Human anatomy, histology, physiology, biochemistry and consent of instructor. A 2-year in-depth study of the causative agents of disease and death; inflammation and repair; hyperplasia-neoplasia; and disorders of immunity and a detailed study of the pathologic basis of diseases affecting specific organ systems. This course will include the cellular, organ, and organism levels will be discussed. Students will view material from human specimens at the electron microscope levels. Students learn the structure and physiological functions of the main tissue types, and the interplay of mechanical, metabolic and genetic influences on these processes. (F) Steinbach

211. Human Neurobiology. (3) Three hours of lecture per week. Prerequisites: 220 or Molecular and Cell Biology 120 (or equivalent); and consent of instructor. All aspects of basic neurobiology needed for medical education will be covered, including central nervous system development, learning, sensory input, motor output and consciousness. Emphasis on learning the nervous system as a whole and understanding the role of the nervous system in clinical medicine. (SP) Steinbach

213. Human Neurobiology. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Molecular and Cell Biology 266. A survey of pharmacology for graduate and medical students. Basic pharmacokinetics and pharmacodynamics and the effects of drugs at the molecular, cellular, organ, and organism levels will be discussed. Therapeutic applications will be considered. (F,SP) Weiss

220. Human Physiology. (4) Three hours of lecture per week and two and one-half hours of laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 201; Molecular and Cell Biology 102; or consent of instructor. How major organ systems work and interact to maintain human life. Covers basic physiology relevant to the practice of medicine and the progression of medical knowledge. Emphasis is on understanding the structures that can be seen at the light and electron microscope levels. Students learn the structure and physiological functions of the main tissue types, and the interplay of mechanical, metabolic and genetic influences on these processes. Students will view material from human specimens when available, or similar tissues in mammals. (F) Brocklehurst

227. Introduction to the Clinical Process. (2) One and one-half hours of lecture and one and one-half hours of laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in HMO and Medical Sciences Program or consent of instructor. An interdisciplinary approach to basic principles of health and illness and professional-client interaction. Focus is on development of observational, information-gathering, and interpersonal communication skills. (SP) Swartzberg

231A-231B. Principles and Practices of Counseling in Health Settings. (3,3) Three hours of lecture/seminar per week. Prerequisites: Graduate standing in Health and Medical Sciences Program or consent of instructor. First semester develops theoretical foundations appropriate to counseling in health settings: normal development, counseling theory, illness or disability in infants and children, and impacts on family. Emphasis on integration of theory and clinical experience. Second semester, open only to HMS students in one of the basic science and genetic counseling, including family dynamics and role playing. (F,SP) Nemzer

233A-233B. First-Year Field Work Methods. (2,2) Two hours of lecture per week. Prerequisites: Graduate standing in Health and Medical Sciences Program or consent of instructor. First year of the program of clinical field work experience for students interested in clinical medicine. Topics include primary care in the community, science in society, and the nature of suffering and the goals of public health and medicine. Also listed as Public Health C202B. (F,SP) Weil

245A-245D. Clinical Genetics: Biology and Methodology. (1.1;1.1) Two hours of lecture per week for eight weeks. Prerequisites: Graduate standing in Health and Medical Sciences Program. Modular coverage of biology and technology including embryology, cancer genetics, DNA technology, cytogenetics, and biochemical genetics. (F,SP) Weil

247. Health Politics, Policy, and Policy Analysis. (4) Four hours of seminar per week. Prerequisites: Graduate standing in Health and Medical Sciences Program or consent of instructor. This seminar for future health practitioners presents a multidisciplinary analysis of health services organization, financing, and policy. Students will analyze how health care problems regarding the social and political forces and institutions that affect health. (F) Newacheck

261. Thesis Seminar. (1) Course may be repeated for credit. Two hours of seminar every other week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Enrollment in UCB-UCSF Joint Medical Program; research participation in a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Health and Medical Sciences Joint Medical Program. Thesis seminar is led by UCB-UCSF Joint Medical Program, School of Public Health, and other UC Berkeley faculty. The goal of the seminar is for the student to progress toward completion of a master’s thesis and to encourage the development of high quality, scholarly research. Topics include the design of experimental, cohort, case-control, and cross-sectional research. Computer-aided approaches to the analysis of quantitative and qualitative data; critical analysis of scientific literature; and the development of effective written and oral presentations of research findings. Students are expected to complete extensive readings in the area of their own research focus, to set and meet long- and short-term research objectives, to summarize and critique papers on topics salient to the seminar’s content, and to write, present, and defend a thesis. (F,SP) Boyce

262. Ethics Committees and Health Care Decision Making. (2) Course may be repeated for credit with consent of instructor. Two hours of lecture per week. Prerequisites: Graduate Standing and Consent of instructor. Formerly Molecular and Cell Biology 266. A survey of pharmacology for graduate and medical students. Basic pharmacokinetics and pharmacodynamics and the effects of drugs at the molecular, cellular, organ, and organism levels will be discussed. Therapeutic applications will be considered. (F,SP) Weiss

271. Conceptual Dilemmas in Public Health and Medicine. (2) Two hours of seminar per week. Prerequisites: Graduate standing in Health and Medical Sciences Joint Medical Program. This course addresses a series of major conceptual dilemmas confronted by both public health and medical students in studying health and disease. While many of these dilemmas or problems form a largely unseen “background” in the health sciences, each is an integral part of the theoretical foundation brought to epidemiologic studies. Readings are drawn from the epidemiologic, biologic, social, and historical/philosophical literatures. Topics include problems in assigning causation; definitions of disease and disability; biomedical and the health sciences; how society manages risk; the role of the press in communicating health information; and the nature of suffering and the goals of public health and medicine. Also listed as Public Health C202B. (F,SP) Boyce, Reingold

290A-290B. Advanced Seminar in Genetic Counseling. (3,3) Three hours of lecture/seminar per week. Prerequisites: 231A-231B or consent of instructor. On-going case discussion and analysis of genetic counselors’ experiences for students preparing to work as genetic counselors. (F,SP) Weil

292. Colloquium on Health and Health Care. (5) Course may be repeated for credit. One and one-half hours of discussion per week for two hours of lecture every other week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. A series of guest lecturers will discuss aspects and implications of health and health care from personal and professional perspectives and experiences. Specific topics are developed in consultation with students and include primary care in the community, science in society, and similar topics. Field trips to community sites may be arranged. (F,SP) Boyce

296. Special Study. (1-10) Course may be repeated for credit. Individualized instruction for faculty members. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Designated to permit qualified graduate students to pursue special study under the direction of a faculty member. (F,SP) Staff
298. Directed Group Study. (1-6) Variable. Sections 1-8 to be graded on a satisfactory/unsatisfactory basis. Sections 9-15 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. Independent study. One unit of credit represents 4 hours of student work per week in the regular semester. Prerequisites: Graduate standing in HMS Program or consent of HMS faculty member. Independent study, research, and writing in an area related to program of study, sponsored by an approved faculty member and approved by program adviser. (F,SP) Staff

Professional Courses

470A-470B. First-Year Field Work Supervision. (1) One hour of supervision every other week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Concurrent enrollment in 497A or 497B. Bi-weekly individual clinical supervision in conjunction with 497. (F,SP) Goldstein

475. Supervised Field Work and Counseling in Human Genetics. (6-10) Field work. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in HMS Program or consent of instructor. Fall or full-time training and supervised field work for one semester in a birth defects center. Primarily designed for Genetic Counseling students but open to qualified graduate students. (F,SP) Goldstein

480A-480B. Second-Year Field Work Supervision. (1) One hour of supervision every other week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Concurrent enrollment in 475 or 485. Bi-weekly individual clinical supervision in conjunction with 475 or 485. (F,SP) Goldstein

485. Second-Year Field Placement for Genetic Counseling. (6-12) Course may be repeated for credit. One unit for each four hours per week scheduled at field placement. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Limited to second-year genetic counseling students; concurrent enrollment in 290 required. Second-year field work in genetics clinics under supervision to enhance clinical skills and integrate clinical theory with experience. At least two 11-week placements are required. Regularly scheduled supervision provided by placement facility and program faculty. (F,SP) Goldstein

490A-490B. Literature Seminar. (1-1) One hour of group study per week and four summary sessions per semester. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Health and Medical Sciences. A detailed discussion of one or a few related papers in the medical-genetic or psychosocial domain, with emphasis on the nature and adequacy of research methods and analysis and on the implications for clinical practice. (F,SP) Hook, Weil

497A-497B. First-Year Field Placement for Genetic Counseling. (3-5) Minimum six units required in academic year. One unit for each four hours per week scheduled at placement. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Limited to first-year genetic counseling students; concurrent enrollment in 231A required. Variety of field placements in health care settings. Field work moves from observation to work with clients. Weekly supervision provided by placement faculty and option counseling course and counseling course instructor. (F,SP) Goldstein

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264 / Health Services and Policy Analysis

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Health Services and Policy Analysis

(School of Public Health, Interdepartmental Graduate Groups)

Department Office: 411 Warren Hall, (510) 643-8571
Chair: Stephen Shortell, Ph.D.

Professors

Eugene Bardach, Ph.D. (Public Policy)
Jean Bloom, Ph.D. (Public Health)
Yale Brausern, Ph.D. (Information Management and Systems)
Glenen Carr, Ph.D. (Business)
Ralph Catalano, Ph.D. (Public Health)
Lee Friedman, Ph.D. (Public Policy)
Paul Gertler, Ph.D. (Public Health)
Teh-Vei Hu, Ph.D. (Biostatistics)
Theodore Keefer, Ph.D. (Economics)
David Leonard, Ph.D. (Biostatistical Science)
Kristin Luker, Ph.D. (Sociology)
James Robinson, Ph.D. (Public Health)
Thomas Randall, Ph.D. (Public Health)
Ruth Schaffler, Ph.D. (Public Health)
Stephen Shortell, Ph.D. (Public Health)
S. Leonar Syme, Ph.D. (Public Health, Emeritus)

Associate Professors

Frederick Collignon, Ph.D. (City and Regional Planning)
Judith Gruber, Ph.D. (Biostatistics)
James Instrom, Ph.D. (Public Health)
Frances Van Loo, Ph.D. (Business)

Terry Marsh, Ph.D. (Business)

Overview

The Ph.D. group in Health Services and Policy Analysis is interdisciplinary. 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 administratively located in the Division of Health Policy and Management.

The group integrates and applies disciplinary knowledge in economics, politics, and organizational theory 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 issues. Specialty fields in economics, political science, and organizational theory are offered. Dissertation research is empirically based and relevant to the provision, financing, and evaluation of health services.

History

(College of Letters and Science)

Department Office: 3229 Dwinelle Hall, (510) 642-1971

Chair: Stephen Shortell, Ph.D.

Professors

Richard M. Abrams, Ph.D. (Public Administration)
Anthony Adamiathwaite, Ph.D. (Public Administration)
Mary C. Anderson, Ph.D. (Public Administration)

Tulio Halperin, Ph.D. (Public Administration)

Richard Herr, Ph.D. (Emeritus)

Judith Gruber, Ph.D. (Emeritus)

Frederick Collignon, Ph.D. (Emeritus)

Eugene F. Irschick, Ph.D. (Emeritus)

W. Michael Hook, Ph.D. (Emeritus)

David L. Johnson, Ph.D. (Emeritus)

Ernest L. Junger, Ph.D. (Emeritus)

Peter B. Zinoman, Ph.D. (Emeritus)

James Vernon, Ph.D. (Emeritus)

David Henkin, Ph.D. (Emeritus)

Robin L. Einhorn, Ph.D. (Emeritus)

Robert L. Middlekauff, Ph.D. (Emeritus)

David G. Johnson, Ph.D. (Emeritus)

Kerwin Klein, Ph.D. (Emeritus)

Waldo E. Martin, Jr., Ph.D. (Emeritus)

Mary P. Ryan, Ph.D. (Emeritus)

Thomas R. Metcalf, Ph.D. (Emeritus)

Richard E. Neave, Ph.D. (Emeritus)

Andrew E. Barshay, Ph.D. (Emeritus)

W. Michael Hook, Ph.D. (Emeritus)

William T. Murray, Ph.D. (Emeritus)

Anthony Adamthwaite, Ph.D. (Emeritus)

Frederic E. Wakeman, Jr., Ph.D. (Emeritus)

Robert J. Brentano, Ph.D. (Emeritus)

Andrew E. Barshay, Ph.D. (Emeritus)

Eugene F. Irschick, Ph.D. (Emeritus)

Mary C. Anderson, Ph.D. (Emeritus)

W. Michael Hook, Ph.D. (Emeritus)

David L. Johnson, Ph.D. (Emeritus)

Ernest L. Junger, Ph.D. (Emeritus)

Peter B. Zinoman, Ph.D. (Emeritus)

James Vernon, Ph.D. (Emeritus)

David A. Hollinger, Ph.D. (University of California, Berkeley, U.S., intellectual)

Eugene F. Irschick, Ph.D. (University of Chicago, Chicago, U.S., intellectual)

David G. Johnson, Ph.D. (University of California, Berkeley, East Asia, pre-modern China)

James H. Kettner, Ph.D. (Harvard University, U.S. Colonial, legal, political, intellectual)

Thomas W. Laqueur, Ph.D. (Princeton University, Britain, social, history, medicine)

John E. Lesch, Ph.D. (Princeton University, History of science, biology, life sciences)

Linda A.eed, Ph.D. (Columbia University, Latin America, Brazil, family)

Robert F. Levenson (Morison Professor, Ph.D. University of California, Berkeley, Recent U.S. social, labor, Black)

Yale Brausern, Ph.D. (University of California, Berkeley, Recent U.S. social, cultural, Black)

Richard F. Metcalf, Ph.D. (Princeton University, East Asia, intellectual)

Judith Gruber, Ph.D. (Emeritus)

Frederic E. Wakeman, Jr., Ph.D. (Emeritus)

Robert L. Middlekauff, Ph.D. (Emeritus)

Henry M. May, Ph.D. (Emeritus)

Richard Herr, Ph.D. (Emeritus)

Judith Gruber, Ph.D. (Emeritus)

James Vernon, Ph.D. (Emeritus)

David Henkin, Ph.D. (Emeritus)

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David L. Johnson, Ph.D. (Emeritus)

Ernest L. Junger, Ph.D. (Emeritus)

Peter B. Zinoman, Ph.D. (Emeritus)
Major Advisers: Consult Undergraduate Office.

Department Overview

The Department of History offers a program of instruction ranging widely over the historical record of human experience. The chronological, geographical, and topical range affords great flexibility to students working toward degrees in history and to 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 11 courses, usually for a total of 45 units.

Four lower division courses in history are required for admission to the major. One course must be completed in each of the following areas:

I. Western Civilization to 1400: R1, 4A, 4B, 30A; Freshman and Sophomore Studies 44A, 44B; Undergraduate Interdisciplinary Studies 55A.

II. European History since the Renaissance: R1, 5A, 5B, 31; Freshman and Sophomore Studies 44C, 44D; Undergraduate Interdisciplinary Studies 55B.

III. History of the United States: R1, 7A, 7B, 16, 17A, 17B.

IV. Latin America, Asia, Africa: R1, 8A, 8B, 9A, 9B, 9C, 9D, 10.

An approved freshman-sophomore seminar (History 39) may be substituted in one of the areas required for admission to the major.

In the upper division, history majors must complete at least seven history courses, including:

1. Four upper division lecture courses, chosen from at least two of the following: Ancient, Europe, Britain, United States, Latin America, Asia, Africa, History of Science. May include Economics 111A, 111B, 113, and 115.

2. Two proseminars (History 103) in two different fields of history as listed in 1 above (for purposes of this requirement sections of History 103 in European History pre-1400 and post-1400 may be counted as proseminars in different fields).

3. History 101 (Seminar in Historical Research and Writing for History Majors) in one of the fields selected for History 103.

Upper Division Honors Program.
The program is intended for senior majors of high ability in history who have the necessary grade-point averages (at least 3.5 in the major and 3.3 overall) and who will profit from individual work with a member of the faculty and discussions with students of similar interests. Interested students should notify the undergraduate adviser during their junior year.

All honors students must complete, in addition to major requirements:

1. History H102, Colloquium on Historical Thought.

2. An oral examination based on the student’s research and historical studies.

3. An honors research essay under the supervision of a member of the Department who has consented to direct it. For this purpose students will take either:

   a) History H195, Senior Honors. In some cases, the essay produced in History 195 may be a development from (but not a revision of) the paper produced in History 101.

   b) History 285, a graduate research seminar.

   While the faculty supervisor will assign a grade for History 285 or History 195, the Honors Committee will determine whether or not the essay is of honors quality.

The Honors Committee will evaluate the candidate’s course work, performance in History 102, the oral examination, and the research essay. If the student’s work is of honors quality in the committee’s estimation, the committee will award Honors, High Honors, or Highest Honors as warranted by the overall performance.

Further information is available in the departmental office.

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 Schedule of Classes is issued before each semester and the departmental course descriptions issued at the beginning of each semester provide further detailed information about the courses offered by the History Department, 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 non-majors as well as prospective majors, this course introduces students to the discipline of history as a humanistic inquiry into 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 traditions, contemporary historical debates, and an exploration of historical sources available at Berkeley. Satisfies half of the Reading and Composition requirement. (F,SP)

4A. Ancient. (4)

4B. Medieval. (4)

5. European Civilization from the Renaissance to the Present.

(4) Two hours of lecture and two hours of discussion per week. Introduces students to the origins of European civilization. Emphasis on class discussions, readings in the sources, and writing of essays. (F,SP)

6. Origins of Western Civilization.

Two hours of lecture and two hours of discussion per week. Introduces students to the origins of Western civilization. Emphasis on class discussions, readings in the sources, and writing of essays. (F,SP)

4A. Ancient. (4)

4B. Medieval. (4)

5. European Civilization from the Renaissance to the Present. (4) Two hours of lecture and two hours of discussion per week. A survey of Europe from the Renaissance to the present. (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. From Colonial Settlement to the Civil War. (4) This course satisfies the American cultures requirement. (F,SP)

7B. From the Civil War to the Present. (4) This course satisfies the American cultures requirement. (F,SP)


Three hours of lecture and two hours of discussion per week. (F,SP)

8A. Latin America. (4) The colonial period. (F,SP)

8B. Latin America. (4) The national period. (F,SP)


Three hours of lecture and two hours of discussion per week. An introductory survey of the history of Asia. (F,SP)

9A. China. (4)

9B. Japan. (4) (F,SP)

9C. India. (4)

9D. Southeast Asia. (4)

9E. Middle East. (4)

10. African History. (4) Two hours of lecture and two hours of discussion per week. An introductory survey of the history of Africa. (F,SP)

10A. The Forging of the U.S.: Expansion and Interaction among American People. (4) Three hours of lecture and two hours of discussion per week. Forbids 16. Considers the culturally diverse Americans who reside within the geographical boundaries of today’s U.S. The history, societies, cultures, perceptions, attitudes and laws of these peoples are the subject matter. Groups will be looked at chronologically in terms of the natural historical processes that brought them together during expansion westward and southward by the Anglo-American governmental units. These groups are: European, Native, African, Chicano American, and Pacific Islanders. This course satisfies the American cultures requirement.

C17A. Cultural Identity in American History. (4) Four hours of lecture per week. This course will examine the major theories pertaining to identity in America—e.g., the melting pot, Anglo conformity, cultural pluralism—as well as such newer theories as Afrocentrism, Creolization, and multiculturalism. These formulations will then be evaluated through the reading of original documents, as well as the viewing of films, photos and paintings, and listening to music, all focusing on the experiences and thoughts of African Americans, American Indians, Chicano/Latinos, and European Americans. This course satisfies the American cultures requirement.

R20. Introduction to the Practice and Theory of History. (5) Three hours of lecture and two hours of discussion per week. In this course we are going to explore the writing of history from its modern intellectual roots in 19th century philosophy to recent experimental work with autobiography. Students will learn to evaluate historical arguments; acquire familiarity with the use of primary sources as diverse as published classics, landscapes, movies, and so on; and gain a critical perspective of the history of historical practice. Satisfies half of the Reading and Composition requirement. (F,SP) Klein

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 4-5 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 seminars are offered in all campus departments and topics vary from department to department and semester to semester. Enrollment limited to fifteen freshmen.

30. Science and Society. Two hours of lecture and two hours of discussion per week. (F,SP)

30A. Science from Antiquity through Newton. (4) The emergence of science as an organized activity.

30B. Science, Technology, and Society since Newton. The development of science and its applications as a major force in modern society.

39. Freshman/Sophomore Seminar. Course may be repeated for credit with different instructor. Seminar Format. 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.

98. Directed Group Study for Lower Division Students. (2) Course may be repeated for credit. Three hours of lecture/discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing. Open to seniors only. Small group discussion focusing on topics of interest that vary from semester to semester. Grading based on discussion and written work.

Upper Division Courses

100. Special Topics. (4) Course may be repeated for credit. 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. Consult department catalog during pre-enrollment week each semester. (F,SP)

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

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
101. Seminar in Historical Research and Writing for History Majors. (5) Three hours of seminar per week. Individual research projects carried out in seminar sections in various historical fields resulting in a lengthy paper, with oral and written discussions on general problems of historical inquiry. In addition to regular class meetings, individual consultations with the instructor, research, and preparation totaling ten to twelve hours per week are required. (F,SP)

H102. Colloquium on Historical Thought. (4) Two hours of seminar per week. Prerequisites: Completion of 101; either junior honors standing or senior non-honors standing. Consideration of the nature and function of historical thought as manifested in major historical classics and selected historical problems. Required of honors program juniors; open, by permission of instructor, to non-honors program seniors upon completion of 101. (F,SP)

103. Proseminar: 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)

103N. Canada. (4) (F,SP)

103S. 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.

105B. Classical. (4) From ca. 500 until the time of Philip II of Macedon. More complex relations between Greek cities.

105C. Hellenistic Age. (4) From Alexander the Great to Cleopatra. The course explores the achievements of Alexander, the struggle for power among his successors, the social, political and economic history of the new Hellenistic kingdoms, and the expansion of Greek culture into the Near East.

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, Scipio, and Caesar.

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, with things and discussions of war, peace, society, and Roman literature as a reflection of social and intellectual life.

107. Topics in Ancient History. Three hours of lecture and one hour of discussion per week.

107D. Roman Law. (4) This course will pay attention to sources of law, form, and procedure. It will concentrate on matters of private law, especially the family, acquisition of particular things, inheritance, and contracts. The development of the constitution and of the criminal courts in the Late Republic will be noted.

109A. The Rise of Islamic Civilization, 600-1200AD. (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 an Islamic empire and its effects on the societies it governed; the creation of an Islamic legal, political, and ideological framework; the empires and legacies of the Crusades, and nomadic conquest; 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. (4) Three hours of lecture and one hour of discussion per week. The development of pre-modern empires and the formation of national states in the Arab world, Turkey, and Iran: Islam and nationalism.

111. Topics in the History of Southeast Asia. Three hours of lecture and one hour of voluntary discussion per week. (F,SP)

111A. Southeast Asia to the 18th Century. (4) The rise of the region’s most important classical and early modern states: long-term economic, social, and religious trends. (F,SP)

111B. 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. (F,SP)

111C. Political and Cultural History of Vietnam. (4) This course provides an introduction to the main issues in Vietnamese history from the mythic and archaeological 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 Africa. (4)

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 modern 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)

114B. Modern South Asia. (4)

116. China. Three hours of lecture and one hour of discussion per week.

116B. The Middle Period. (4)

116C. Modern China. (4)

118. Japan. Three hours of lecture and one hour of discussion per week.

118A. Archaeological Period to 1800. (4) Emphasis on political, cultural, and intellectual history of the Early Imperial State, Japan’s first military governments, early modern, and Meiji Japan.

118B. 1800-1900. (4) Emphasis on the social and intellectual history of Japan’s pre-war reconstruction.

118C. Late Nineteenth Century to the Present. (4) Japan’s experience of the twentieth century, beginning with the development of capitalism and the acquisition of an empire, examining key achievements and tragedy that came with Japan’s emergence as a world power. Emphasis on social and intellectual history, and on how Japan has understood itself and the world in this century. (F,SP)
birth and infancy, children’s rights, learning, and the state of the superparent. A significant research paper is required. Also listed as Undergrad Interdisciplinary Studies C132. (F,SP) Fass, Mason


130A. 1493-1914. (4)
130B. 1914-Present. (4)

131. Social History of the United States. Three hours of lecture and one hour of discussion per week. The nature and development of social and economic institutions, class, family and racial relationships, sex roles, and cultural norms in the United States.

131A. 1607-1865. (4)
131B. 1865-Present. (4)

132A-132B. Intellectual History of the United States. (4,4) Three hours of lecture and one hour of discussion per week.

C132B. Intellectual History of the United States, (4) Students will receive no credit for C132B after taking 132B. Three hours of lecture and one hour of discussion per week. American Studies C132B. (F,SP) Hollinger

133. American Jewish History. (4) Three hours of lecture and one hour of discussion per week. The study of the Jewish Americans from the first settlement to the present day, with special emphasis upon cultural and intellectual history.

134A. The Age of the City. (4) Three hours of lecture and one hour of discussion per week. A cultural and social history of urban life in America, with emphasis on the nineteenth century.

134AC. The Age of the City. (4) Three hours of lecture and one hour of discussion per week. A cultural and social history of urban life in America, with emphasis on the nineteenth century.

140. Mexico. Three hours of lecture and one hour of discussion per week. (F,SP)

140A. Regional Approaches to Mexico in the Colonial Period. (4) Three hours of lecture and one hour of discussion per week. The course begins in the post-Conquest period (1519-1821)? Reckoning with this question in regional and temporal ways opens up to much of Mexico’s early history and provides a foundation for the study of a national history in History 140B. (F,SP)

140B. Modern Mexico. (4) This course offers a broad view of Mexican history from the late colonial period to the present. (F,SP)

141. Social History of Latin America. Three hours of lecture and one hour of discussion per week. (F,SP)


143. Brazil. Three hours of lecture and one hour of discussion per week. (F,SP)

144. The Golden Age (1492-1800). Three hours of lecture and one hour of discussion per week. This course follows America’s “Golden Age” over the four centuries of contact between Europe and the Americas. The course begins in the Pre-Columbian Americas and covers the colonial period, the independence movements in the 19th century, and the modern period to the present.

150. Medieval England. Three hours of lecture and one hour of discussion per week. Emphasis on the period from the 11th to the 15th centuries. (F,SP)

151. Modern Britain. Three hours of lecture and one hour of discussion per week. Prerequisites: An elementary knowledge of the history of Western Europe.

158. European Economic History. Three hours of lecture and one hour of discussion per week. (F,SP)

159. The Renaissance and the Reformation. Three hours of lecture and one hour of discussion per week. (F,SP)

165A. History of the United States. Three hours of lecture and one hour of discussion per week. Emphasis on the “symbolist” (rather than the “sequential”) mentality which pervaded the patrician and early medieval periods. Deals in its entirety with the period of the Church Fathers from Tertullian and Origen to Gregory the Great; particular stress on the thought of St. Augustine.

165B. Medieval Intellectual History. (4) Emphasis on the interplay between the symbolist-non-linear thinking found mostly in monastic circles and the growth of new forms of “scientific,” linear, or sequential thinking (scholasticism) found in the new cathedral schools and universities.

C157. The Renaissance and the Reformation. Three hours of lecture and one hour of discussion per week. Emphasis on the period from the 11th to the 15th centuries. (F,SP)

159C. 1414 to the Present. (4) Three hours of lecture and one hour of discussion per week. Emphasis on the period from the 11th to the 15th centuries. (F,SP)

159D. European Economic History. Three hours of lecture and one hour of discussion per week. (F,SP)

160. The International Economy of the Twentieth Century. Three hours of lecture and one hour of discussion per week. Development and crises of the
advanced economies, with particular emphasis on trade relations with third world countries. Economic impact of war, business cycles, and social movements. This course is equivalent to Economics 115; students will not receive credit for both courses.

161. Emergence of Modern Industrial Societies. (4) Four hours of lecture per week. Survey of the development of the modern political economies of the United States, Europe, and Japan; evolution and interaction of the major institutions of advanced capitalist societies; differences and similarities of their business communities, labor organization, and patterns of government relationships with the private sector.

162A-162B. International History. (4,4) Three hours of lecture and one hour of discussion per week. European international relations in the 19th and 20th centuries, with emphasis on the political and economic forces shaping foreign policy and the international system.

163. Modern European Intellectual History. Three hours of lecture and one hour of discussion per week. Thought and art considered in their social and political contexts.

163A. From the Enlightenment to 1870. (4)

163B. From 1870 to the Present. (4)

164. Social History of Western Europe. Three hours of lecture and one hour of discussion per week.

165. Topics in Modern European History. Three hours of lecture and one hour of discussion per week.

165A. The Reformations of Christendom. (4) This course examines not a period but a process: the reform and disruption of the civilization called “Christendom” during the 16th and 17th centuries and its transformation into the familiar European of the nation states. (F,SP)

166. Modern France. Three hours of lecture and one hour of discussion per week.

166A. Early Modern France to 1715. (4)

166B. Old Regime and Revolution. (4)

166C. Modern France. (4)

167. Modern Germany. Three hours of lecture and one hour of discussion per week.

167A. Early Modern Germany. (4)

167B. Germany in the 19th Century. (4)

167C. Germany in the 20th Century. (4)

168. Spain and Portugal. Three hours of lecture and one hour of discussion per week.

168A. From Earliest Times to 1715. (4)

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.

170C. Poles and Others: The Making of Modern Poland. (4) Three hours of lecture and one hour of discussion per week. This course uses the devices of historical and literary interpretation to expose and analyze some of the lines of political and cultural development that have led to the Poland we now know. Beginning with the awakening of modern Polish nationalism, it traces the emergence of this Poland through the rise of mass society; the horrifying and exhilarating spectacles of World War I and national and social revolutions; first experiments with modern Polish statehood (especially policies toward ethnic minorities and socially marginalized groups); then the transformations wrought by a half century of totalitarian rule; ethnic cleansing, elite transfer, forced social stratification, and, despite all of this, the defiant return of civil society. Students must attend lectures, complete required readings, take two examinations, and write a substantial paper. (F,SP)

171. Russia. Three hours of lecture and one hour of discussion per week.

171A. Russia to 1700. (4)

171B. Russia 1700-1917. (4)

171C. The Soviet Union, 1917 to the Present. (4)

173. History of Eastern Europe. Three hours of lecture and one hour of discussion per week.

173A. From 1500 to 1900. (4)

173C. From 1900 to Present. (4)

174B. Jewish History. (4) Three hours of lecture and one hour of discussion per week. Jewish history from earliest times to the present.

175. Topics in the History of Eastern Europe. Three hours of lecture and one hour of discussion per week. (F,SP)

175A. A History of Poland-Lithuania. (4) The course will focus on the development of identities within the constantly shifting borders of Polish-Lithuanian and Polish states. Among the topics: competing definitions—ethnic, confessional, linguistic, political—of Polishness; continuities and discontinuities in Polish history and historiography; Poland between East and West; the development of Polish self-perceptions; Jewish, Lithuanian, and Ukrainian identities in the Polish context; the Polish chapter in the events leading to the fall of Communist hegemony in Eastern Europe. (F,SP)

175B. 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 culture and civilization. It covers the middle ages and the early modern period, including kabbalah, mysticism, biblical and rabbinical literature, Jewish philosophy, and the Italian Jewish renaissance. Also listed as Undergrad Interdisciplinary Studies C154 and Religious Studies C134. 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, 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 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 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 concepts of nationhood and citizenship, and (2) a study of the Europeanization of culture. Also listed as Geography C152, Interdisciplinary Studies C115 and Religious Studies C115. Staff

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 Ar- menian history, from the process of ethnogenesis to the almost complete destruction of the Armenian “feu- dal” system by the Ottoman Empire. This course is based on the framework of Armenian political history and institutions, but also emphasizes economic development, social change, and cultural transforma- tions. (F,SP)

177B. From Pre-modern Empires to the Present. (4) This course will cover the period from the incorporation of most of the Armenian plateau into the Ottoman Empire to the present day. (F,SP)

180. Topics in the History of Biology. (4) Three hours of lecture and one hour of discussion per week.

181. Topics in the History of the Physical Sciences. Three hours of lecture and one hour of discussion per week.

181B. Modern Physics: From The Atom to Big Sci- ence. (4) Establishment of the ideas and institutions of modern physics. Unfolding the classical world picture: radioactivity, Einstein, quantum mechanics, philo- sophical disputes. The evolving structure of the discipline, links with industry and government, World War II and the atomic bomb. Postwar conceptual consol- idation and the emergence of big science. (F,SP)

183. Topics in the History of Medicine. (4) Three hours of lecture and one hour of discussion per week.

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 as it has responded to cultural, social, and political change. (F,SP)

185A. Beginnings to ca. 1250. (4) (F,SP)

185B. 1250 to the Present. (4)

C191. Death, Dying, and Modern Medicine: His- torical 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 pre-med, pre-law, and public policy students to under- stand these matters in light of the historical and, more broadly, literary and artistic perspectives of the humanities. Also listed as Undergrad Interdisciplinary Studies C133 and Health and Medical Sciences C133. (SP) Laquer, Micco

H195. Senior Honors. (4) Independent. Prerequisites: Senior honors standing. Limited to senior honors candi- dates. Directed study centering upon the preparation of an honors thesis. Supervisors will be assigned to each student after consultation with the honors com- mittee.

C196W. Special Field Research. (10.5) Course may be repeated for a maximum of 12 units. 240-300 hours work per semester plus regular meetings with the fac- ulty supervisor. Prerequisite: Consent of instructor. Formerly C196W. Students to work in selected intern- ship programs approved in advance by the faculty co- ordinator and for which written contracts have been es- tablished 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 produce a final pa- per for the course consisting of no fewer than 35 pages. Other restrictions apply; see faculty adviser. Also listed as History of Art C196W, Undergrad Inter- disciplinary Studies C196W, Women’s Studies C196W, Mass Communications C196W, Political Sci- ence C196W, Political Economy of Industrial Soc C196W, and Sociology C196W.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Independent. Must be taken on a passed/not passed basis. Pre- requisites: 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/sem- inar 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 cat-alog for details.

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 survey of the literature and historical problems of the different fields in history.

275A. Ancient. (4)
275B. Europe. (4)
275D. United States. (4)
275E. Latin America. (4)
275F. Asia. (4)
275S. History of Science. (4)

280. Advanced Studies: Sources/General Literature of the Several Fields. Course may be repeated for credit. Three hours of seminar per week. For precise 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 medieval, with practice in the methodologies, tools, sources, and the editing and use of texts relevant to a particular field of history; instruction in any auxiliary science requisite for historical research.

283. Historical Method and Theory. (4) Three hours of seminar per week. Designed especially for candidates for higher degrees in History. Stress is laid on practical exercises. For precise schedule of offerings see department catalog during pre-enrollment week each semester.

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)

289. 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)

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. 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 for student’s language examinations and the master’s examination.

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. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for doctoral degree. Individual study, in consultation with the graduate adviser, to prepare students for language examinations and the doctoral examination.

Interdepartmental Studies Courses

Upper Division Course

IDS 100. History of American Technology. (4) Four hours of lecture per week. Survey of American technology from colonial times to the present. Analysis of technical innovations in cultural, social, and economic contexts. Prerequisite: consent of instructor.

280. Advanced Studies: Sources/General Literature of the Several Fields. Course may be repeated for credit. Three hours of seminar per week. For precise schedule of offerings see department catalog during pre-enrollment week each semester.

285. Research Seminars. Three hours of seminar per week. For precise schedule of offerings see department catalog during pre-enrollment week each semester.

289. 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)

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. 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 for student’s language examinations and the master’s examination.

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. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for doctoral degree. Individual study, in consultation with the graduate adviser, to prepare students for language examinations and the doctoral examination.

Interdepartmental Studies Courses

Upper Division Course

IDS 100. History of American Technology. (4) Four hours of lecture per week. Survey of American technology from colonial times to the present. Analysis of technical innovations in cultural, social, and economic contexts. Prerequisite: consent of instructor.

280. Advanced Studies: Sources/General Literature of the Several Fields. Course may be repeated for credit. Three hours of seminar per week. For precise schedule of offerings see department catalog during pre-enrollment week each semester.

285. Research Seminars. Three hours of seminar per week. For precise schedule of offerings see department catalog during pre-enrollment week each semester.

289. 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)

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. 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 for student’s language examinations and the master’s examination.

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. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for doctoral degree. Individual study, in consultation with the graduate adviser, to prepare students for language examinations and the doctoral examination.

Industrial Engineering and Operations Research

(College of Engineering)

Department Office: 4135 Etcheverry Hall #1777, (510) 642-5484 http://www.ieor.berkeley.edu/
Chair: Lee W. Schruben, Ph.D.

Professors
Ilan Adler, Ph.D. Stanford University. Mathematical programming.
Dott S. Hochbaum, Ph.D. University of Pennsylvania. Combinatorial optimization, management information systems.
Robert C. Leachman, Ph.D. University of California, Berkeley. Management science.
Shmuel S. Ore, Ph.D. Stanford University. Economic systems theory and modeling.
Sheldon M. Ross, Ph.D. Stanford University. Stochastic processes, simulation, statistical analysis.
Lee W. Schruben, Ph.D. Yale University. Computer simulation.
J. George Shanthikumar, Ph.D. University of Toronto. Stochastic processes, manufacturing.
Candace A. Yano (Chair), Ph.D. Stanford University. Production and distribution systems planning.
Richard E. Barlow, Ph.D. (Emeritus)
David Galt, Ph.D. (Emeritus)
C. Roger Glassey, Ph.D. (Emeritus)
Raymond C. Grassi, M.S. (Emeritus)
Willard S. Jewell, Sc.D. (Emeritus)
James T. Lapsley, Jr., M.S. (Emeritus)
Robert M. Oliver, Sc.D. (Emeritus)
Ronald W. Wool, Ph.D. (Emeritus)

Associate Professor
Kenneth Y. Goldberg, Ph.D. Carnegie-Mellon University. Robotics and geometric algorithms

Assistant Professors
Hyun-Soo Ahn, Ph.D. University of Michigan. Production operations and economic systems
Aiper Mammadov, Ph.D. Georgia Institute of Technology. Polyhedral combinatorics, integer programming
Philip M. Kaminsky, Ph.D. Northwestern University. Modeling and analysis of production and logistics systems

Industrial and Systems Engineering

Department 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 and, while this is often the basis for operations research, it requires well-developed integrative skills and creativity. The theoretical foundations of optimization, stochastic systems, reliability, and engineering economics often form the basis for operations research studies. 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, communications, waste management, transportation, and logistics.

Undergraduates in 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 which stress the construction of systems models, the role of the human being in these systems, and the relevant mathematics and computer methods or optimization setting. Topics include the Industrial Revolution, technology of war, infusion of science in technology, industrialization and the use of corporations. Sponsoring departments are Industrial and Electrical Engineering and Computer Science.

Curriculum for the Bachelor’s Degree

A total of 120 units is required, including:

Lower Division Requirements.
Mathematics 1A-1B, 53, 54; Engineering 77N; Physics 7A-7B; Chemistry 1A; English 1A; and Statistics 134. Also, six courses of at least 3 units each in humanities and social studies selected from an approved list of courses are required. Of these, at least one course must be an English composition course taken from the current approved college list of courses (List E), one must be from a list of selected courses in History and Culture, one must be from a list of selected courses in Literature and Values and two must be upper division courses. The English composition course and either the course in History and Culture, or that in Literature and Values must be taken for letter grade. A minimum of two courses, at least one of which is in the upper division, must be taken from a single department. Eleven units of Engineering breadth courses are also required, 6 units of which must be from a list of approved courses.

Upper Division Requirements.
Engineering 120 and 190 and the following courses in Industrial Engineering and Operations Research: 131, 160, 161, 162, 165, and 180. Also required are six courses, chosen from the following categories, including a minimum of three courses in Category A and a minimum of two courses in category B. Category A—IEOR 130, 155, 166, 170, Category B—IEOR 115, 140, 170; Category C—IEOR 171.

*Students not completing IERG 140 must take one of the following courses: CS 9C, 9F, or 9G or pre-
sent evidence of equivalent course work. Such students must still complete two courses in Category B.

Graduate Programs

Graduate programs are offered leading to the M.S., M.Eng., Ph.D. or D.Eng.

The programs have been developed to meet the needs of individuals with backgrounds in engineering, management sciences who wish to enhance their knowledge of the theory, development, and use 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 the thesis or by comprehensive examination. Doctoral degrees require oral examination in the major and two minor fields followed by submission of a thesis demonstrating ability to conduct independent advanced research. Several computing laboratories, as well as a human systems integration laboratory, are available for graduate research.

The department requires all graduate applicants to submit scores of the Graduate Record Examination (GRE). Further information on graduate programs may be obtained from the Industrial Engineering and Operations Research Office, 4135 Etcheverry Hall, Berkeley, CA 94720-1777, and in the Announcement of the College of Engineering.

Staff

Note: In addition to the courses listed in the I&O section of this catalog, the Department of Industrial Engineering and Operations Research offers the following courses found in the Engineering section: 102: Introduction to Operations Research; 120: Principles of Engineering Economics.

Lower Division Courses

24. Freshman Seminars. (Course may be repeated for credit as topic varies. One hour of seminar per week. Section 1 to be graded on a passed/not passed basis. Sections 2 and 3 to be graded on a letter-grade basis. Section 2 to be graded on a passed/not passed basis. The Berkeley 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. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F) Staff

39. Freshman/Sophomore Seminar. (Course may be repeated for credit as topic varies. Seminar format. Sections 1-3 to be graded on a passed/not passed basis. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students 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. (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: Statistics 134, upper division standing. Design and implementation of databases, with an emphasis on industrial and commercial applications. Relational algebra, SQL, normalization. Students work 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: Mathematics 54, Statistics 134 (may be taken concurrently). Analytical techniques for the improvement of manufacturing performance along the dimensions of productivity, quality, customer service, and throughput. Techniques for yield analysis, process control, inspection sampling, equipment efficiency analysis, cycle time reduction, and process improvement. Applications on semiconductor manufacturing or other industrial settings. (SP) Leachman

131. Computer Simulation of Industrial Engineering Systems. (3) Three hours of lecture per week. Prerequisites: 161, Statistics 134, 135 (may be taken concurrently). Computer simulation, design of experiments, uncertainty analysis, and statistical analysis of a simulation study. Discussions will include the types of problems that can effectively be solved by such methods. The course will be specific to the design of simulation models of random variable generation for a variety of common types of random variables. Techniques to reduce the variance of the resultant estimator as well as a statistical analysis of output of the simulation are considered. Final project required. (SP) Staff

140. Industrial Production and Design. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: Upper division standing. This course is designed as an introduction to design and industrial production. Lectures address computer aided design (CAD), Internet-based B2B ordering, rapid prototyping, numerical control, computer aided manufacture (CAM), quality specification and tolerancing, packaging, automated inspection, and path planning for AGVs. Industrial Engineering and Operations Research Office, 4135 Etcheverry Hall, Berkeley, CA 94720-1777, and in the Announcement of the College of Engineering.

Staff

Note: In addition to the courses listed in the I&O section of this catalog, the Department of Industrial Engineering and Operations Research offers the following courses found in the Engineering section: 102: Introduction to Operations Research; 120: Principles of Engineering Economics.

150. Production Systems Analysis. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 161, 162, or senior standing in manufacturing engineering. The purpose of the course is to provide students with an understanding of the problems and concepts related to the design, control, and evaluation of production systems. The course will cover production systems, including production planning, inventory control, forecasting, and scheduling. (F) Yano

151. Service Operations and Design 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, demand management, employee scheduling, service quality management, and capacity planning. (SP) Staff

153. Facilities Planning and Design. (3) Two hours of lecture and two hours of discussion per week. Prerequisites: 161, 162, or senior standing in manufacturing engineering. Traditional manual and modern methods in facility layout. Equipment selection analysis. Materials handling and warehousing system analysis. Facility location and allocation models. Emphasis will be placed on the use and limitations of both general purpose modeling tools and specialized algorithms to address these facilities design problems. (F) Kamin-

160. Operations Research I. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 54. Deterministic methods and models in operations research. Unconstrained and constrained optimization. Equality, inequality, and integer constraints, Sequencing problems, Assignment problems, Resource allocation, equipment replacement, inventory control, production planning. (SP) Staff

161. Operations Research II. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 54 and 54. Formulation to linear programs. Optimal allocation and control problems in industry and environmental settings. Convex sets; properties of optimal solutions. The simplex method; theorems of duality; computational complexity. Problems of post-optimization. Special structures; network problems. Digital computation. (F,SP)

165. Engineering Statistics, Quality Control, and Forecasting. (3) Three hours of lecture per week. Prerequisites: Statistics 134 and CME 100. Statistical concepts, design of experiments, hypothesis testing, regression analysis, analysis of variance, and non-parametric statistics. Applications of these statistical techniques to data analysis problems in engineering and manufacturing systems will be the main focus of this course. Specific applications of statistical techniques will be considered in detail. Forecasting based on moving average, exponential smoothing, and regression analysis will be studied. Quality and process control charts, x-bar, moving average, cusum, and range charts will be discussed. (SP) Shankhumar

166. Decision Analysis. (3) Three hours of lecture per week. Prerequisites: 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 probabilistic risk assessments. Graphical methods and computer software using event trees, decision trees, and influence diagrams that focus on model design. (F) Oren

170. Human Factors for Engineering Design. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: Computer Science 9C, upper division standing. Introduction to the design of user interfaces for engineering systems, with emphasis on the control of complex processes. Analysis of rational human decision making process, considerations of the human, machine interface, human decision making under uncertainty. Emphasis on the development of “acts”, “states”, and “observations” and optimal decision making rules. Design and evaluation of decision aids for process control. Rapid prototyping and development of interfaces through User Information Management Systems (UIMS). Laboratory exercises and a design project using UIMS undertaken. (F) Staff

171. Introduction to Design of Human Work Systems and Organizations. (3) Students cannot receive credit for both 171 and Business Administration 150. Three hours of lecture per week. Prerequisites: Upper division standing. Qualitative management principles and techniques used to maximize labor productivity, employee satisfaction, and organizational performance in work settings. Topics covered include job attitudes, person-job fit, worker motivation, leadership, organizational culture, technology and innovation management, public service, groups and teams, decision making, and power and influence. (F) Staff

180. Senior Project. (4) One hour of lecture, one hour of consultation with faculty adviser, and six hours of company visitation per week. Prerequisites: 131, 160, 161, 162, Business Administration 120B, Engineering 120, 190, plus three other Industrial Engineering and Operations Research electives. Application of systems analysis and industrial engineering to the analysis, planning, and design of industrial, service, and government systems. Emphasis on the theoretical and economic aspects of equipment and process design. Students work in teams under faculty supervision. Topics vary yearly. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for credit as topic varies. One hour of seminar per week. Prerequisites: 160, 161, 162, Business Administration 120B, Engineering 120, 190, plus three other Industrial Engineering and Operations Research courses. Undergraduate students in industrial engineering and operations research may be given the opportunity to work on an individual project in an area of interest under faculty advisement. Special projects approved by the faculty adviser require a written proposal. Students must submit a written report at the end of the term. (SP) Staff

Graduate Courses

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. (SP) Staff

270 / Industrial Engineering and Operations Research
New issues raised by the World Wide Web. 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 or 262A, course in probability, or consent of instructor. A course on economic concepts useful for engineers that will cover, among other topics, those of interest rates, present values, arbitrage, geometric Brownian motion, options pricing, and portfolio optimization. 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 of evaluating real options will be presented. The use of mathematical optimization models as a framework for analyzing financial engineering problems will be shown. (F) Alder, Oren, Ross

251. Facilities Design and Logistics. (3) Three hours of lecture per week. Prerequisites: 262A and 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

254. Production and Inventory Systems. (3) Three hours of lecture per week. Prerequisites: 262A or 150; 263A or 161 recommended. Mathematical and computer-based methods for design, planning, scheduling, and control in manufacturing and distribution systems. (SP) Staff

261. Experimenting with Simulated Systems. (3) Three hours of lecture per week. Prerequisites: 263A and an upper division statistics course. This course will introduce graduate and upper division undergraduate students to modern methods for simulating discrete event models of complex stochastic systems. About a third of the time will be devoted to system modeling, with the remaining two-thirds concentrating on simulation experimental design and analysis. (F,SP) Ross, Schruben, Shanthikumar

262A. Mathematical Programming I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 110. Basic graduate course in linear programming and introduction to network flows and non-linear programming. Formulation and model building. The simplex method and its variations. Sensitivity analysis, parametric programming, convergence (theoretical and practical). Polynomial time algorithms. Introduction to network flows models. Optimality conditions for non linear optimization problems. (SP) Adler, Oren

262B. Mathematical Programming II. (3) Three hours of lecture per week. Prerequisites: Math 110 or equivalent. Basic first year graduate course in optimization of non-linear programs. Formulation and model building. Sensitivity analysis, parametric programming, convergence and uncontrolled problems. Study of algorithms for non-linear optimization with emphasis on design considerations and performance evaluation. (SP) Adler, Oren

263A. Applied Stochastic Process I. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 134 or Statistics 200A. Conditional Expectation. Poisson and renewal processes. Renewal reward processes with application to inventory, congestion, and replacement models. Discrete and continuous time Markov chains; with applications to various stochastic systems—such as exponential queueing systems, inventory models and reliability systems. (F) Ross, Shanthikumar

263B. Applied Stochastic Process II. (3) Three hours of lecture per week. Prerequisites: 263A. Continuous time Markov chains. In particular, the concept in continuous time Markov chains with applications of queueing theory. Semi-Markov processes with emphasis on application. Brownian Motion. Random walks with applications. Introduction to Martingales. (SP) Ross, Shanthikumar

264. Computational Optimization. (3) Three hours of lecture per week. Prerequisites: 262A. This course is on computational methods for the solution of large-scale optimization problems. The focus is on convexity and duality in optimization. Computational techniques. Course topics include an introduction to polyhedral theory, cutting plane methods, relaxation, decomposition and heuristic approaches for large-scale optimization problems. (SP) Atamturk

266. Network Flows and Graphs. (3) Three hours of lecture per week. Prerequisites: 262A. Survey of solution techniques and problems that have formulations in terms of flows in networks. Max-flow min-cut theorem. Minimum cost flows. Multicommodity flows. Multiterminal and multicommodity flows. Relationship with linear programming, transportation problems, electrical networks and critical path scheduling. (SP) Hochbaum


268. Applied Dynamic Programming. (3) Three hours of lecture per week. Prerequisites: Mathematics 51. Dynamic programming formulation of deterministic decision process problems, analytical and computational solutions of mathematical programming, application of problems to equipment replacement, resource allocation, scheduling, search and routing. Brief introduction to decision making under risk and 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. System Analysis and Design Project. (3) Three hours of lecture per week. Prerequisites: 262A-262B and 263A. A project course for students interested in applications of operations research and engineering methods. One or more systems, which may be public or private sector, will be selected for detailed analysis and designed by student groups.

290K. Advanced Topics in Robot Algorithms. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Graduate standing in engineering. We study a variety of geometric methods and algorithms for robotics and manufacturing. Such algorithms accept as input a CAD model of the environment and return as output a set of solutions such as a robot motion plan. Topics to vary from semester to semester.

290L. Logistics Modeling. (3) Three hours of lecture per week. Prerequisites: 262A, 262A. Advanced course focusing on research in the area of modeling and analysis of logistics systems. Initial topics include analytical techniques such as worst-case and average-case analysis. Later topics include the application of these techniques to routing, inventory, and integrated distribution models and algorithms. Kaminsky

290P. Pricing Policies. (2) Two hours of lecture per week. Prerequisites: 262A, Economics 201A or consent of instructor. Examination of pricing related issues from economic systems and marketing perspectives. Course may be repeated for credit. Pricing policies for different industries. Discussion of market conditions comparable with various pricing policies and their implications for consumers and producers. Emphasis on mathematical models. Staff

298. Group Studies, Seminars, or Group Research. (1-4) Course may be repeated for credit. Seminars. Sections 1-4 to be graded on a satisfactory/unsatisfactory basis. Sections 5-8 to be graded on a letter basis. Individual study for comprehensive in preparation for the field adviser. Prize may not be used to meet either unit or residence requirements for a master’s degree. (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 for comprehensive in consultation with the field adviser. Units may not be used to meet either unit or residence requirements for the doctoral 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 for the PhD (and other doctoral degrees). May not be used for unit or residence requirements for the doctoral degree. (F,SP) Staff

Professional Courses

301. Teaching Assistant Training. (1-4) Course may be repeated for credit. One meeting per week with faculty member. Must be taken on a satisfactory/unsatisfactory basis. One meeting weekly with faculty member discussing teaching methods including: text selection, clarity of oral delivery; use of visual aids, media resources; discussion hours. (F,SP) Staff

Infectious Diseases and Immunity

(School of Public Health. Interdepartmental Graduate Groups)

Office: 233 Warren Hall, (510) 642-2613
Chair: Richard Stephens, Ph.D.

Professors

James Allison, Ph.D. (Molecular and Cell Biology)
Robert S. Lane, Ph.D. (Environmental Science, Policy, and Management)
G. Steven Martin, Ph.D. (Molecular and Cell Biology)
Daniel Portnoy, Ph.D. (Public Health/Molecular and Cell Biology)
Arthur Reinfeld, M.D. (Public Health)
Lee W. Riley, M.D. (Public Health)
Hitoshi Sakano, Ph.D. (Molecular and Cell Biology)
George Sensabaugh, D.Crim. (Public Health)
Richard Stephens, Ph.D. (Public Health)
John Taylor, Ph.D. (Plant and Microbial Biology)
Glenys Thomson, Ph.D. (Integrative Biology)
Constantine Tampakis, Ph.D. (Plant and Microbial Biology)

Associate Professors

Gertrude Bluhering, Ph.D. (Public Health)
Niall Shashti, Ph.D. (Molecular and Cell Biology)

Assistant Professors

Suzanne Fleck, O.D., Ph.D. (Optometry)
Eva Harris, Ph.D. (Public Health)
Fenyong Liu, Ph.D. (Public Health)
Ellen Robey, Ph.D. (Molecular and Cell Biology)
Program Overview

The Graduate Group in Infectious Diseases and Immunity provides opportunities for study on 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. 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, vaccine and drug development, and public health practices for disease prevention and control. Students matriculating through this program will acquire expertise in fundamental infectious disease research and thus are well prepared for careers in academia, governmental agencies, and biotechnology.

Information Management and Systems

(School of Information Management and Systems)

Office: 102 South Hall, (510) 642-1464
http://www.sims.berkeley.edu

Dean: Hal R. Varian, Ph.D.

Professors
Robert Berring (Law Librarian), J.D. Legal information
Yale M. Brauenstein, Ph.D. Economics of information and communication
Michael R. Buckland, Ph.D. Library management, information retrieval, and history of information management
Michael D. Cooper, Ph.D. Design of information systems, economics of information
Peter Lyman, Ph.D. Ethnographic study of communication and social formation in digital and networked environments
Pamela Samuelson, J.D. Intellectual property law
J. Douglas Tygar, Ph.D. Electronic commerce, cryptography, security, and privacy
Nancy A. Van House, Ph.D. Work practice-based design of digital libraries and information systems
Hal R. Varian (Dean and Professor, Class of ’1944), Ph.D. Economics of information
Robert Wissensky, Ph.D. Digital information systems, user interfaces and artificial intelligence, natural language processing, common sense reasoning and knowledge representation (Computer Science)

Associate Professor
Ray R. Lasek, Ph.D. Information retrieval system design and evaluation

Assistant Professors
John Chuang, Ph.D. Computer networks, Internet economics
Mark Heiser, Ph.D. Information access systems, user interfaces, robust text analysis
Warren Sack, Ph.D. Computer-mediated communication, online communities, architecture and design for online spaces, social networks, computational linguistics, media studies

Programs

The information revolution has created the need for a new kind of professional: someone who is skilled in locating, organizing, manipulating, filtering, and presenting information. The mission of the School of Information Management and Systems (SIMS) is to educate such information managers. Information managers must be familiar with the technology used to store, organize, and retrieve information in business, government, libraries, and academic settings. However, technical expertise alone is not sufficient for success; SIMS graduates are expected to not only manage technology but to manage information and people as well, and they need to acquire the necessary skills to do this effectively.

Today’s information managers need to understand how to organize information and design front ends for information systems that allow for efficient and effective user interaction. They need management skills to direct the development and deployment of software systems; and they must be able to assure the quality of information and its value to those who will use it for decision making. Most importantly, they need to understand the economic and social environment in which their organization functions and be familiar with the relevant issues in law, economics, ethics, and management.

This profession is inherently interdisciplinary, requiring aspects of computer science, cognitive science, business, law, library/information studies, and communications. Graduates of SIMS find employment in major corporations, government offices, the media industry, libraries, and academic institutions—wherever information is created and managed.

The Master’s Degree in Information Management and Systems

The Master of Information Management and Systems program is a 42-unit, two-year program designed to train students in the skills needed to succeed as information professionals. The first year of the program consists of a core curriculum with courses in information organization and retrieval, distributed computing, user interfaces and information policy, and management skills. The second year involves additional electives, with the expectation that the student will specialize in particular aspects of information management and systems. During the summer between the two years, students are encouraged to work as interns in order to use their newly acquired skills in real-world settings. Internships can be in corporate, government, and nonprofit institutions.

The 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 research of those fields to pass written and oral examinations, and completes original research culminating in the written dissertation. 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 the contribution of an original piece of research revealing high critical ability and powers of imagination and synthesis.

Fields of Study. The following are the fields for the Ph.D qualifying examination. Periodic changes to the list of fields and revisions to the descriptions can be expected and will be announced to all students.

- Information users and society.
- Organization and representation of information
- Management of information organizations and services
- Economics of information
- Information retrieval
- Information technology
- Systems analysis, design, and implementation
- Information policy
- Law and information management

Degree Requirements

In the first years of course work, students gain a broad background in Information Management and Systems (IMS), then acquire an in-depth understanding of one major and two minor specific disciplines or research areas, and complete a preliminary project paper. In order to gain this broad foundation in IMS as well as detailed background knowledge sufficient to do research, each student should:

- Enroll in required core INFOSYS courses;
- Take the Doctoral Colloquium, INFOSYS 295, at least once, and attend one of the continuing research seminars in the school closest to your research interests; and,
- Work with your Advisory Committee to identify and take a set of advanced courses tailored to your interests from SIMS and other departments on campus.

As a capstone to the course work, students will submit preliminary project papers to their Advisory Committees. Once the Advisory Committees have unanimously approved the preliminary project paper, students may continue to prepare their dissertation proposals and take the qualifying examination. Advance to candidacy, which takes place on the recommendation of the school to the Graduate Council, requires these steps:

- Satisfactorily completing the preliminary project paper overseen by the student’s Advisory Committee;
- Passing an oral qualifying examination administered by a committee appointed by the Graduate Council;
- Approval of a dissertation proposal by an ad hoc committee of the faculty.

After advancement to candidacy, candidates must complete a dissertation under the guidance of a committee appointed by the Graduate Council. The committee consists of three members, one of whom must be from a department other than Information Management and Systems. Before taking final action on the dissertation, the committee, if it desires, may require the candidate to defend the dissertation in a formal oral examination.

Lower Division Courses

24. Freshman Seminar. (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 in a small-seminar setting. Freshman seminars are offered in many 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. 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) Staff

Upper Division Courses

101. Introduction to Information Systems. (3) Three hours of lecture per week. Introduction to Information and Information Systems: Concepts (information, data, documents); processes (inquiry, retrieval, use); social context (demand, provision, control, influence on social values). Retrieval based information services such as archives, databases, libraries, information centers, MIS. (F,SP) Buckland
136. Introduction to Database Management. (3) Three hours of lecture per week. Introduction to principles of information design and to the use of database management systems. Design considerations and evaluation; data modeling and implementation planning. Characteristics and evaluation of general and specialized database management systems. Design, implementation, and evaluation of a database using commercial database management software. (F) Staff

142AC. Access to American Cultural Heritages. (3) Three hours of lecture per week. Formally 142AC: An introduction to the preservation, description, and use of tangible forms of cultural heritage. Documentation, ownership, and control of access to cultural heritage. U.S. cultural heritage and identity, cultural policies, and cultural institutions (libraries, media, museums, schools, historic sites, etc.). This course satisfies the American cultures requirement. (F) Buckland

162AC. Print, Literacy, and Power in America to 1865. (4) Three hours of lecture per week. Formerly 162. Focus on European Americans, Native Americans, African Americans, and in the western United States, Asian American and Chicano/Latinos. The culture and the oral and print societies as found in the focus cultures to assess the dominant print culture on oral cultures. Image in woodcut and engraving as information and as propaganda. The role of education in achieving literacy. The emergence of an African American press in the 19th century, tied to growing political support from the abolitionist press, is in striking contrast to the nearly invisible Native American voice confined to the reservation. San Francisco is a case study of the emergence of a multicultural print and education environment, followed by repressive laws, propaganda, and educational systems that de-emphasize standardization and education in English. Printing technology tends toward centralization, standardization, and, finally, a program that strips the voices of a multicultural, multilingual population. This course satisfies the American cultures requirement. (SP) Duggan

190. Special Topics in Information Management and Systems. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. This course provides an opportunity to learn about topics of current interest. Topics will vary. A seminar paper will be required. Open to students from other departments. (F:SP Staff)

Graduate Courses


204. Information Users and Society. (4) Three hours of lecture per week. The impact of information and technology on society. Technology, privacy, intellectual property, and ethical problems in networked information environments. Information flows and user needs. Strategic uses of information in organizations. Design, maintenance, and evaluation of information services and products. (SP) Staff

217. Information Skills for Professionals in the Public and Nonprofit Sectors. (3) Three hours of lecture per week. Information-related skills for policy formulation and decision-making. Topics include the role of information in decision-making and policy formulation; diagnosing needs; the search process; using published and unpublished sources, key informants, and experts; evaluating, synthesizing, presenting, and using information. Includes extensive use of electronic information sources. Particularly appropriate for non-sims students. (F:SP Staff)

219. Privacy, Security, and Cryptography. (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/private key exchange. Security problems in networked information environment including viruses, worms, trojan horses, Internet address spoofing. (SP) Tygar

220. Management of Information Systems and Services. (3) Three hours of lecture per week. Introduction to external and internal management issues in information organizations. Internal issues: organizational behavior, organizational theory, personnel, budgeting, planning. External issues: organizational environments, politics, marketing, strategic planning, funding sources. (SP) Buckland

221. Information Policy. (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 distribution of information. Use and the protection of intellectual property, trans-border data flow, privacy, libel, and copyright problems in networked information environment. Issues of potential conflicts in values and priorities in information policy. (SP) Braunstein

222. Marketing Information Products and Services. (3) Three hours of lecture per week. Prerequisites: 208 or consent of instructor. Approaches to the marketing of information products and services, including analysis of user needs, market structure, pricing, market behavior, and distribution. (SP) Van House

224. Strategic Computing and Communications Technology. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering, business administration, information management and systems, or consent of instructor. Factors strongly impacting the success of new computing and communications products and services (based on underlying technologies such as electronics and software) in commercial applications. Technology trends and implications, standardization, intellectual property, government policy, and industrial organization. Strategies to manage the design and marketing of successful products and services. Also listed as Electrical Engineering C203, Engineering C204, C205, or consent of instructor. (SP) Van House


231. Economics of Information. (3) Three hours of lecture per week. The measurement and analysis of the role information plays in the economy and of the economic processes devoted to shaping and consuming information. Economic analysis of the information industry. Macroeconomics of information. (SP) Braunstein

235. Legal Issues in Information Management. (3) Three hours of lecture per week. Introduction to legal issues in information management, antitrust, contract management, international law including intellectual property, trans-border data flow, privacy, libel, and constitutional rights. (SP) Samuelson

237. Intellectual Property. (3) Three hours of lecture per week. The philosophical, legal, historical, and economic foundations of the nature of laws protecting intellectual property. Topics include types of intellectual property (copyright, patent, trade secrecy), the interaction between law and technology, various approaches (including compulsory licensing), and the
relationship between intellectual property and compatibility standards. (SP) Samuelson


245. Organization of Information in Collections. (3) Three hours of lecture per week. Prerequisites: 202 or consent of instructor. Standards and practices for organization and description of bibliographic, textual, and non-textual materials. Selection, cataloging, classification, indexing, and evaluation of cataloging, classification, indexing, and thesaurus systems for specific settings. Codes, formats, and standards for representation and transfer of data. (SP) Larson

246. Multimedia Information. (3) Three hours of lecture per week. Prerequisites: 205, 204, or consent of instructor. Concepts and methods of design, management, creation, and evaluation of multimedia databases. Organization and retrieval of digital multimedia. Information capture, storage, standards, display, networking, standards, copyright, and vocabulary control. Review of applicable digital technology. (SP) Staff

247. Information Visualization and Presentation. (3) Three hours of lecture per week. Prerequisites: 205 or consent of instructor. 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) Heard

248. Preservation and Conservation of Information Resources. (3) Three hours of lecture per week. Prerequisites: 205 or consent of instructor. Management of digital and non-digital information resources including issues of authentication, integrity, version control, legacy control, storage, personal privacy, and rights of access. Conservation of paper, film, magnetic, and optical media. Conversion of information from one medium to another including data format conversion and digitization. Standards regarding quality of physical materials and digital surrogates. (F) Larson

250. Computer-Based Communications Systems and Networks. (3) Three hours of lecture per week. Prerequisites: 206 or consent of instructor. Communication concepts, network architectures, data communication software and hardware, networks (e.g., LAN, WAN), computer security, standards, design, storage, and management, distributed information systems. Policy and management implications of the technology. (F) Larson

255. Data and File Structures. (3) Three hours of lecture per week. Prerequisite: 255 or consent of instructor. Data structures used in information processing such as in information retrieval systems, text processing systems, image and geographic information systems. Includes analysis of data structures: sequential, direct, indexed, hashed, b-tree. Management of fixed and variable-length records. Standards for information organization: SGML, HTML, 239.50, 239.58. MARC. (SP) Staff

257. Database Management. (3) Three hours of lecture per week. Prerequisites: 255 or consent of instructor. Presentation of database management system. 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) Staff

256. Use of Database Management Systems. (3) Three hours of lecture per week. Prerequisites: 258, 257, or consent of instructor. Group development of database applications using a commercial database management system. Includes developing functional specifications, data model, database design, interface design, system implementation, documentation. (SP) Staff

267. Systems Implementation: Use Programming Languages. (3) Three hours of lecture per week. Prerequisites: 208, 250, 255 or consent of instructor. Group development of software package using a programming language such as C, C++, or JAVA as a basis. Includes developing functional specifications, design, interface design, system implementation, documentation. (SP) Staff

268. Systems Implementation: Authoring Tools. (3) Three hours of lecture per week. Prerequisites: 202, 204, 208. Development of informational or instructional resources using authoring tools. Development of specifications based on user needs. System design, implementation, evaluation, and testing. Development of documentation. (SP) Staff

271. Quantitative Research Methods for Information Systems and Management. (3) Three hours of lecture per week. Prerequisites: 255 and 257 or consent of instructor. Design of computer software for library automation, including acquisitions, serials, circulation systems, and library catalogs. Group development of a library automation software package including functional specifications, design, programming, testing, and system implementation. (F) Staff


282. Design of Library Automation Systems. (3) Three hours of lecture per week. Prerequisites: 255 and 257 or consent of instructor. Design of computer software for library automation, including acquisitions, serials, circulation systems, and library catalogs. Group development of a library automation software package including functional specifications, design, programming, testing, and system implementation. (F) Staff

284. Geographic Information System. (3) Three hours of lecture per week. Prerequisites: 202 or consent of instructor. Spatial and geographical information: geocoding, projections, gazetteers, mapping and overlays of socio-economic, environmental and political data. Spatial database operations. Codes, formats and standards for data representation and transfer. (F) Larson


290. Special Topics in Information Management and Systems. (1-5) Course may be repeated for credit as topic varies. Four hours of work per week per unit. May be taken on a satisfactory/unsatisfactory basis. (F,SP) Staff

291. Individual Study. (1-12) Course may be repeated for credit as topic varies. Format varies. Prerequisites: 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 as topic varies. Four hours of work per week per unit. May be taken on a satisfactory/unsatisfactory basis. Individual research work under supervision of a faculty member. Does not count toward a degree. (F,SP) Staff

Professional Courses

310. Teaching Assistance Practicum. (1-6) Course may be repeated for credit as topic varies. Four hours of work per week per unit. May be taken on a satisfactory/unsatisfactory basis. Discussion, reading, preparation, and practical experience in teaching. (F,SP) Staff

401. Research Skills Practicum. (1-6) Course may be repeated for credit as topic varies. Format varies. A faculty member. Does not count toward a degree. (F,SP) Staff

Integrative Biology

(College of Letters and Science)

Department Office: 3060 Valley Life Sciences Building, (510) 642-3285

Undergraduate Student Services: (510) 643-7204

Graduate Student Services: Admissions—(510) 642-5024; Graduate Assistant—(510) 643-5125

Chair: Marvalle H. Wake, Ph.D.

Professors

George A. Brooks, Ph.D. University of Michigan. Exercise physiology and metabolism

Roy L. Caldwell, Ph.D. University of Iowa. Invertebrate behavioral biology and ecology

William A. Clemens, Jr., Ph.D. University of California, Berkeley. Vertebrate paleontology

Francis E. Diamond, Ph.D. University of California, Berkeley. Neuroanatomy, environment, immune functions, hormones

Robert J. Full, Ph.D. State University of New York, Buffalo. Comparative biomechanics, physiology and functional morphology

Stephen E. Glickman, Ph.D. McGill University. Animal behavior, physiological substrates of behavior

Carole Hickman, Ph.D. Stanford University. Evolutionary paleobiology, morphology, systematics

Neil K. Johnson, Ph.D. University of California, Berkeley. Ornithology and evolutionary biology

Mimi A.R. Korel, Ph.D. Duke University. Invertebrate functional morphology and biomechanics

Paul Licht, Ph.D. University of Michigan. Comparative endocrinology

David R. Lindberg, Ph.D. University of California at Santa Cruz. Evolutionary biology, education

Jere H. Lipps, Ph.D. University of California at Los Angeles. Marine biology, functional morphology

Brent D. Mishler, Ph.D. Harvard University. Bryology, systematics, and evolutionary biology

Craig C. Moritz, Ph.D. Australian National University. Molecular evolution, conservation biology

Clara S. Nicol, Ph.D. Michigan State University. Hormone, growth regulation and cancer

Kevin Padian, Ph.D. Yale University. Paleontology, evolutionary biology

James R. Witten, Ph.D. University of Arizona. Mammalogy and evolutionary biology

Thomas M. Powell, Ph.D. University of California, Berkeley. Geochronology and paleobotany

Mary E. Power, Ph.D. University of Washington. Freshwater ecology, toxic webs
The department uses many traditional fields and levels of complexity in forging new research directions, asking new questions, and answering traditional questions in new ways. The various fields within the department cooperate across disciplinary boundaries, sharing information and knowledge. Experience in laboratory and/or field, technological and independent study will bring about an understanding of scientific logic based on both experimental and historical patterns and processes.

The faculty has special strengths in the disciplines of morphology, organismal physiology, animal behavior, biomechanics, ecology, systematic biology, paleobiology, population genetics, and evolution.

Students who major in integrative biology will gain knowledge in general biology, which provides an excellent foundation for health-related professions (medicine, dentistry, veterinary medicine, physical therapy, optometry, etc.) or allied careers in human biology (e.g., psychology, sociology, demography, political science, environmental and resource management, law, etc.) or for those interested in biology of organisms and wish to pursue graduate studies in various subdisciplines such as marine biology, ecology, behavior, paleontology, and evolution.

Lower Division. The foundation for this major includes a basic one-year course in biology; general chemistry, organic chemistry, and physics; and mathematics. Courses in geology, physical sciences, or organismal form and function. In effect, the IB 100A-100B requirement will depend on the student’s chosen path within the major. Paths include evolution, ecology, organismal form and function, and human biology and health sciences. In general, students emphasizing evolution or ecology are required to complete the equivalent of IB 100A, whereas IB 100B (or equivalent) is required for those emphasizing human biology and health sciences or organismal form and function. In effect, the IB 100A-100B breadth requirement ensures that the student will be exposed to the methods and techniques used to perform multidisciplinary work within biology. Laboratory or field courses will introduce the student to practical methods for the study of living and extinct organisms. Additional upper-division courses reflecting the student’s interests and academic goals are selected in consultation with an adviser. The student should complete a minimum of 26 units of upper division course work for the major.

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. Several offerings also cover areas different from the major course of study below, providing useful information for students considering a major in integrative biology. Each year, a variety of seminars are available for freshmen (IB 24) to introduce them to areas of integrative biology.

The Major

Note: All courses must be taken for a letter grade.

 Lower Division. Required of all students in the major:

- Biology 1A (4), 1B (4); Chemistry 1A (4), 3A (5), 3B (4); Mathematics 16A (3); Physics 8A (4), 8B (4).

With approval of an adviser, more advanced courses may be substituted for those listed above. Recommended: additional courses in mathematics, statistics, geology, physical chemistry, biochemistry, history of biology, computer literacy and foreign language.

Upper Division. All students must complete one of the following: IB 100A (3) or IB 100B (3). Consult with an adviser to determine which course is required.

All students must complete an upper division course in genetics chosen from the following: MCB 140 (4), MCB 142 (4), IB 161 (4), IB 164 (4).

plus

At least 120 upper division laboratory field courses.

In addition at least THREE upper division Integrative Biology courses besides those completed in upper division courses will be completed. A student’s program should be approved in consultation with an adviser.

An undergraduate brochure is available in the Undergraduate Student Affairs Office, 2033 Valley Life Sciences Building (VLSB). The booklet will provide additional information and details of the various plans and emphases within those plans. Use this information as a guide to determine what courses are most appropriate for your goals and area of interest.

Juniors and seniors are encouraged to pursue independent study research (IB 199) under the sponsorship of a faculty member. Interested students should have completed at least 60 units of credit and be in good academic standing. An application and faculty research guide can be obtained from the student services unit, 2033 VLSB.

Note: Transfer students with 56-70 units must have completed general chemistry and general biology. Completion of organic chemistry before transfer to Berkeley is strongly recommended.

Honors Program. Students with a GPA of at least 3.3 overall and in the major should consider participating in the honors program. They must find a faculty sponsor appropriate for the original research project they wish to do and enroll in two semesters (6 units) of the honors thesis course (H196A–B). They are encouraged to enroll in a graduate student seminar in the area of their research project and must present the results of that work in the form of a written report, the Honors Thesis. To graduate with honors, students must complete the two-semester course with a 3.3 grade-point average or higher overall and in the major.

Graduate Program in Integrative Biology

Students planning to enter graduate study in integrative biology are expected to have completed the equivalent of a major in a biological science, although students with other appropriate backgrounds are encouraged to enter the program. The Department of Integrative Biology offers a Ph.D. program, and, under special circumstances, an M.A. program. Students may obtain the M.A. degree by thesis or examination; details are available from the department office. The program for the Ph.D. varies considerably, according to the background and interests of individual students. All candidates for the Ph.D. must pass an oral qualifying examination. The crucial part of the Ph.D. program thesis—based upon original research in which the candidate demonstrates the ability to conduct independent study and to incorporate the results in a the-
Research Facilities

The Botanical Garden in Strawberry Canyon provides opportunities for research with living plants, supplies teaching material for classes on campus, and serves as a laboratory for courses. Independent study and internship opportunities are available in horticulture, plant conservation, and ecological, evolutionary and population biology of plants. The garden's collections are especially rich in succulents and Californian, South American, South African, European, and Asian plants, including a Chinese medicinal herb garden and other ethnobotanical collections. Greenhouse facilities are available at the new UCBB Center for the Study of Plant Conservation. The garden is open to the public 9 a.m.-4 p.m. daily except December 25 for the holidays. For further information, see the web site at http://www.mip.berkeley.edu/garden/. Inquiries should be addressed to the Director, Botanical Garden, University of California, Berkeley; Berkeley, CA 94720, or garden@uclink4.berkeley.edu.

The Cancer Research Laboratory is an organized research unit on the Berkeley campus that carries on a research, teaching, and service program dedicated to the prevention and treatment of disease, and to the education of students in graduate and professional programs in medicine, the biological sciences, and public health. The laboratory, which is located in Strawberry Canyon, is a modern laboratory for all types of plant studies, ranging from morphology/anatomy to molecular biology, and fungal and animal research. The laboratory contains all of the collections of the Museum of Vertebrate Zoology, University of California, Berkeley; Berkeley, CA 94720-3112. vresh@nature.berkeley.edu, or resident director/manager Dr. Neil Daves, gump@mail. Further information can also be found on the laboratory web site at http://crl.berkeley.edu. The Museum of Paleontology, a research institute for faculty, students, and qualified visiting scholars, has one of the largest collections of fossils, invertebrates, plants, and vertebrates in the nation, as well as large collections of modern vertebrate skeletal elements and invertebrates. The collection is worldwide in scope and is especially strong in materials from western North America. Research activities include vertebrate paleontology, geographic, paleontochronologic, evolutionary, and theoreo-paleobiologic studies. Field work on all continents by researchers and students associated with the museum continues to sustain substantial collection growth. Special facilities include environmental scanning electron microscopes, molecular biology, and fossil preparation laboratories, as well as specialized laboratories for microfossils, pollen, and cast production, and educational exhibits and collections data available on the museum's World Wide Web computer server. Spectacular fossils, such as a complete Tyrannosaurus rex, are on display in the atrium of the Valley Life Sciences Building. The museum promotes instructional and exhibit materials to the campus and other museums in western North America. Facilities include specialized laboratories and instruments designed specifically for paleontologic studies. Requests for use of the collections or facilities should be addressed to the Director, Museum of Paleontology, Valley Life Sciences Building, University of California, Berkeley; Berkeley, CA 94720.

The Museum of Vertebrate Zoology is an Organized Research Unit affiliated with the Department of Integrative Biology and the Berkeley Natural History Museum, which 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 no public exhibits; it is primarily a research organization and a center for graduate and postdoctoral education. The recently renovated 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 morphology and cytology, protein biochemistry, and evolutionary and developmental biology. Student activities center on problems in evolutionary biology, with emphasis on systematics, ecology, functional and developmental morphology, behavior, population and conservation biology. Integrated use of field and laboratory methods is encouraged. The museum operates the Frances Simes Hastings Natural History Reservation in upper Carmel Valley. The flora and fauna of this 800-hectare tract are protected so that studies of undisturbed habitats and organisms can be undertaken. For more information, write to the Director, Museum of Vertebrate Zoology, University of California, Berkeley; Berkeley, CA 94720, or, for the Hastings Reservation, Dr. Mark Stromberg, Carmel Valley, CA 93925.

The University and Jepson Herbaria offer a worldwide reference-research collection and library that form a foundation for basic research in systematic botany, ecology, phytogeography, and evolution, not only for faculty, staff, and students but also for visiting scholars and botanists throughout the world. The University Herbarium Resources include (1) the collection itself, nearly two million specimens with special strengths in the angiosperm flora of California and elsewhere on the Pacific Rim, as well as major collections in including ferns, bryophytes, fungi, and algae; (2) modern laboratories for all types of plant studies, ranging from morphology/anatomy to molecular systematics. Inquiries should be addressed to the Director, The University Herbarium, University of California, Berkeley; Berkeley, CA 94720.

The University of California Natural Resource System (NRS) was founded in 1965 to establish and maintain significant examples of California’s diverse aquatic and terrestrial ecosystems for university teaching, research, and service. The 33 reserves are open to all qualified individuals and institutions for scholarly work in disciplines ranging from geography and environmental sciences to anthropology and art. For more information on the NRS, contact the UC President's Office at (510) 987-0150 or visit http://nrs.ucop.edu/. For specific information regarding the four reserves administered by the Berkeley campus, contact faculty reserve manager Mark Stromberg at (510) 643-7776 or mepower@socrates.berkeley.edu.

The Berkeley campus administers these four reserves:

The Angelo Coast Reserve in Mendocino County is one of the most diverse reserves, with 26 terrestrial and four aquatic habitat types. Located along the west coast of North America, the reserve has rare species, plants and animals, including the endangered wolverine. For more information, contact James Schmid at (510) 643-8559 or kirchner@geomorph.berkeley.edu.

The Hans Jenny Pygmy Forest Reserve in Mendocino County supports elfin forests of endemic pygmy cypress, bishop pine, and unusual evergreen shrub species on highly podzolized, old marine terrace soils. This reserve is adjacent to lands managed by The Nature Conservancy. For more information, contact Ronald G. Amundson at (510) 643-7890 or earthy@nature.berkeley.edu.

The Hastings Natural History Reserve in Monterey County contains a representative sample of California’s interior Coast Range ecosystem, with annual and perennial grasslands, oak woodlands, chaparral, and running streams. The reserve has 6200 species of plant life. While limited research continues on the endangered wolverine. For more information, contact Mark Stromberg at (831) 659-2664 or stromber@socrates.berkeley.edu.

Lower Division Courses

15. Natural History of Plants and Fungi. (2) Two hours lecture per week. Prerequisites: Open to all students and designed for those not specializing in the biological sciences. Focus is on the natural history of the major groups of plants (including algae and sea-weeds) and fungi, especially as they relate to California. Aspects of natural history include structure, function, ecology (including plant communities, pollination, and dispersal), and use by humans. (F) Schmid

24. Freshman Seminars. (Course) May be repeated for credit as topic varies. One hour of seminar per week. Sections 1-4 research and 1-25 letter-grade basis. Sections 5-8 to be graded on a passed/not passed basis. The Berkeley 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. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP) Staff

31. Animal Biology: A Behavioral View. (3) Students will receive no credit for 31 after taking 144, 145, Integrative Biology 122 or Prerequisite 115B.
Two hours of lecture, one hour of film/demonstration and one hour of discussion per week.
Prerequisites: Open to all students; designed for those not specializing in biology. Formerly Zoology 15. Principles of biology as they relate to animal behavior, with broad coverage of animal groups. Special attention will be paid to the emerging discipline of behavioral ecology.

32. Biomotion. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Open to all students.
Biomotion will involve students in a multidisciplinary vision of biology, engineering design, and computer science by learning the principles of how animals move in their environment. (SP) Full

33. Topics in Paleontology: The Age of Dinosaurs. (3) Three hours of lecture per week. Open without prerequisite to all students and designed for those not specializing in paleontology. Evolution, history, and ecology of the dinosaurs and their world, including the extinction of non-avian dinosaurs. (F,SP)

34. Topics in Paleontology: The Age of Mammals. (2) Both 33 and 34 may be taken for credit with consent of instructor. Two hours of lecture per week.
Formerly Paleontology 2E. Open without prerequisite to all students, but those not specializing in paleontology. An introductory survey course on mammalian evolution. Will emphasize evolutionary theory, adaptation, mammalian diversity through time, and current issues in mammalian paleontology. (F,SP)

39. Topics in Integrative Biology. Two hours of discussion 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 and anatomy of marine mammal groups, and North Pacific species in particular; ecological interactions and role in nearshore and pelagic marine habitats; and interactions between humans and marine mammals. (F) Lindberg

40. Evolutionary Biology—An Introduction for Non-Biology Majors. (3) Two hours of lecture and one hour of discussion per week. This course assumes no background in science. It will cover the history of evolutionary ideas, Darwin’s theory and more modern genetic theories of evolution and the major features of the fossil record. Particular attention will be paid to recent controversies in evolutionary biology.

82. Introduction to the Oceans. (2) Two hours of lecture per week. Prerequisites: Open to all students. One hour of the following courses at high school level: physics, chemistry or biology is recommended. Formerly Paleontology 25. The geology, physics, chemistry and biology of the world ocean. Application of oceanographic sciences to human problems will be explored through special topics such as energy from the sea, marine pollution, food from the sea and climate change.

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: 1A and 1B or their equivalents. Must be taken concurrently with 108 and 108L. Formerly Botany 129. An introduction to principles and methods in paleontology. The biological implications of marine organisms are followed by interdisciplinary discussions of open-ocean pelagic systems, the deep sea, coastal oceans, estuaries, and coral environments. Grade is based on short written assignments. (F) Penny

100A. Physiology, Structure, and Biomechanics. (3) Three hours of lecture and one hour of discussion per week, plus some assigned open computer labs.
Prerequisites: 1A and 1B or their equivalents. Formerly Zoology 100C. Course stresses the principles of how organisms, predators and prey work in their environments: skeletal support, muscular, neural, sensory, hormonal, respiratory, circulatory, digestive, osmotic, and reproductive systems examined. Principles illustrated by an exciting diversity of organisms, including humans. Relevance to ecology, evolution, and medicine presented. (F,SP)

100B. Principles of Biodiversity. (3) Three hours of lecture and one hour of discussion per week, plus some assigned open computer laboratories.
Prerequisites: Biology 1A and 1B or their equivalents. Formerly Zoology 100D. Course stresses the principles of how organisms, predators and prey work in their environments: skeletal support, muscular, neural, sensory, hormonal, respiratory, circulatory, digestive, osmotic, and reproductive systems examined. Principles illustrated by an exciting diversity of organisms, including humans. Relevance to ecology, evolution, and medicine presented. (F,SP)

101L. Laboratory in the Diversity of Plants and Fungi. (2) Two hours of lecture per week.
Prerequisites: Biology 1A and 1B. Must be taken concurrently with 101L. An integrated treatment of the biology and evolution of the major groups in the plant, algal, and fungal kingdoms. Also listed as Plant Biology C101L. (SP) 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 communities of California to climate, soils, vegetation, and the Pleistocene and recent history, and conservation. (SP) Schmid

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 102. Focus on the main plant groups and the major plant families in California, and the use of keys to identify introduced and especially native pteridophytes, conifers, and particularly flowering plants of 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 108. An introduction to the invertebrates, stressing comparative functional morphology, phylogeny, natural history, and aspects of physiology and development. (F) Penny

103L. Invertebrate Zoology Laboratory. (2) Six hours of laboratory per week plus several weekend field trips.
Prerequisites: Must be taken concurrently with 103. Formerly Zoology 187. Laboratory study of invertebrate diversity and functional morphology, and field study of the natural history of invertebrates. Must be taken concurrently with 103. Laboratory for C103. Also listed as Plant Biology C103L. 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 interdisciplinary discussions of open-ocean pelagic systems, the deep sea, coastal oceans, estuaries, and coral environments. Grade is based on short written assignments. (F) Penny

104. Natural History of the Vertebrates. (3) Three hours of lecture per week.
Prerequisites: Must be taken concurrently with 104L. Formerly Zoology 107. Biology of the vertebrates, exclusive of fish. (SP) Staff

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) Staff

106. Biological Oceanography. (3) Three hours of lecture per week.

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 field trip.
Prerequisites: Biology 1A or 4A; Mathematics 1A or 16A; Physics 7A or 8A. Recommended: 82. The biological implications of marine physics and chemistry. History and properties of seawater. Geophysical fluids. Currents and circulation. 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 interactions. Formerly Zoology 108. Also listed as Plant Biology 120 and 120L recommended. Must be taken concurrently with 106. 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. (F) Penny

107. Principles of Plant Morphology. (2) Two hours of lecture per week.
Prerequisites: Biology 1A-1B. Must be taken concurrently with 107L. Formerly Zoology 107. An analysis of the diversity of multi-cellular plants, especially the higher forms, with emphasis on the 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 Biology C107L. (F) Kaplan

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 Zoology 107L. An analysis of the diversity of multi-cellular plants, especially the higher forms, with emphasis on the 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 Biology C107L. (SP) Kaplan

108. Principles of Paleontology. (3) Three hours of lecture and one hour of discussion per week.
Prerequisites: A course in paleontology or in a related science. An introduction to principles and methods in pa-
leontology and paleobiology. This course provides an overview of the information content of the fossil record. We will examine the nature of fossil species, populations, and communities; functional morphology, paleoecology, systematics, and macroevolution. Discussion sections are designed to help students read and evaluate paleontological literature and to develop critical thinking and writing skills. (SP) Hickman

C111. Anatomy of Vascular Plants. (2) Two hours of lecture per week. Prerequisites: 101; 101L; Biology 1A-1B. Must be taken concurrently with 111L. A consideration of plant development and structure, cell, tissue, and organ structure of plants, including their adaptations to ecological factors such as pollination, dispersal, and water availability. (F) Lehman

C111L. Laboratory in the Anatomy of Vascular Plants. (2) Four hours of laboratory per week. Prerequisites: 111; 111L. Must be taken concurrently with 111. Laboratory for 111.

12L. Horticultural Methods in the Botanical Garden. (1) Three hours of laboratory/discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Formerly 122L. An introduction to horticultural techniques utilizing the diverse collections of the University Botanical Garden. (F;SP) Staff

117. Medical Ethnobotany. (2) Two hours of lecture per week. Biological diversity and ethnologic diversity sustain traditional botanical medicine systems of the world. Covered in this course include cultural origins of medicinal plant knowledge on plant-derived pharmaceuticals and phytotherapies; field research methods in ethnobotany and ethnopharmacology; examples of how traditional botanical medicines provide safe, effective, affordable, and sustainable primary health care to tropical countries; human physiology, human diseases, and mechanisms of action of plant-derived drugs. (F) Carlson

117L. Medical Ethnobotany Laboratory. (2) Six hours of laboratory per week. Laboratory will focus on studying medical botany in terms of the major ecosystems and geographical regions of the world. Students will learn common names, scientific names, plant families, field identification, habitats, and ethnobotanical uses of medicinal plants. How the medicinal plant is prepared, administered, and used as a phytomedicine will also be discussed. There will be reference to the phylogenetic relationships between the plant families and genera represented by the medicinal plants. (F) Carlson

121. Muscle Biology and Plasticity. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: 131 or equivalent; Molecular and Cell Biology 32 and 32L; and Physics 8A. Formerly Human Biodynamics 107. Introduction to the structure and function of the musculoskeletal system including muscles, tendons, ligaments, cartilage, and the interaction they develop. Synthesis of knowledge from the level of a single cell to that of the whole body is emphasized in developing an understanding of the linkage between the design of the musculoskeletal system and human movement. (F) Staff

121L. Muscle Biology and Plasticity Laboratory. (1) Three hours of laboratory per week. Prerequisites: 121. Experimental approaches to the analysis of the biomechanics of human movement. Emphasis on the scientific method as applied to human biomechanics. (F) Staff

123A. Exercise Physiology. (3) Three hours of lecture per week. Prerequisites: A college-level course in human physiology with laboratory and Chemistry 1A. Formerly Human Biodynamics 105A. Discussions of how chemical energy is converted within cells, and how potential chemical energy is converted to muscular work. Energetics, direct and indirect calorimetry, pathways of carbon flow in exercise, ventilation, circulation, skeletal muscle fiber types. (F) Brooks

123AL. Laboratory Exercises and Demonstrations Exercise Physiology and Metabolism. (1) Three hours of laboratory per week. Prerequisites: 132 and 123L. Obtain practical experience in the measurement of physiological parameters and to be able to compare, contrast, and interpret physiological data. Laboratory demonstrations and exercises will explain by example, the lecture content. (F) Brooks

123B. Exercise Physiology. (3) Three hours of lecture per week. Prerequisites: 123A. Formerly Human Biodynamics 104B. Analysis of mechanisms of exercise on skeletal muscle; exercise and cardiovascular disease; exercise in the heat, cold, under water, and at altitude; nutrition and performance; effects of drugs on performance; sex differences and performance. (SP) Brooks

123BL. Laboratory Exercises and Demonstrations in Environmental and Exercise Physiology. (1) Three hours of laboratory per week. Prerequisites: 123A, 124A. Formerly Human Biodynamics 107A. Understand the elements of motor control systems; muscles, tendons, ligaments, cartilage, and the interaction they develop. Synthesis of knowledge from the level of a single cell to that of the whole body is emphasized in developing an understanding of the linkage between the design of the musculoskeletal system and human movement. The changes of muscle during the processes of development and aging are discussed, as are the adaptations to physical activity characterized by different recruitment parameters and biomechanical loading strategies, and to injury and regeneration. The importance of these topics to generate and sustain human movement is developed.

123L. Exercise Physiology Laboratory. (1) Three hours of laboratory per week. Prerequisites: 121. This course builds upon previous understanding of the musculoskeletal and nervous systems to understand human movement. The course examines skeletal muscle morphology and the mechanics by which muscle generates force and power. The importance of muscle properties to generate and sustain human movement is developed.

124. Musculoskeletal Biomechanics. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Physics 7A or 8A. Formerly Human Biodynamics 103. Quantitative analysis of the force, movement and interaction, and movement associated with human movement. The mechanical properties of the elements of the musculoskeletal system, including muscles, tendons, ligaments, cartilage, and joint interaction will be discussed. Analysis of the causes and situations of injuries in human physiology (132 after taking Physiology 100 or concurrently). Principles and theories of human physiologic assessment in relation to physical activity and conditioning. Performance of laboratory procedures in interpreting physiological fitness (cardiorespiratory endurance, body composition, musculoskeletal fitness). Also listed as Physical Education C129. (SP) Johannessen

127. Motor Control Laboratory. (2) Four hours of laboratory per week. Prerequisites: 131 or equivalent; a course in physiology (132 or equivalent, Molecular and Cell Biology 32). 121 and 124 recommended. Must be taken concurrently with 127. We will develop a basic understanding of modern theories of information and control and then analyze neuromotor systems to understand the elements of motor control systems; muscles, sensory transducers and motor systems of the brain. We will use information and control theories to synthesize knowledge of the elements into understanding of the control systems that regulate posture, locomotion, and voluntary movement. (SP) Lehman

128. Sports Medicine. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100A or equivalent. Background in anatomy and physiology recommended. Formerly Human Biodynamics 107. Laboratory demonstrations and exercises will explain by example, the lecture content. (F) Brooks

C129. Human Physiological Assessment. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 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 interpreting physiological fitness (cardiorespiratory endurance, body composition, musculoskeletal fitness). Also listed as Physical Education C129. (SP) Johannessen

130. Evolutionary and Functional Vertebrate Morphology. (4) Three hours of lecture and four hours of laboratory per week. Prerequisites: 111-111L, 130A, 130AL or equivalent; consent of instructor; concurrent enrollment in 130L. Study of the structure and function of vertebrates; analysis of patterns of evolution of vertebrates using morphological data and the comparative method. (SP) Staff

130L. Laboratory in Evolutionary and Functional Vertebrate Morphology. (4) Six hours of laboratory per week. Prerequisites: Biology 1A-1B, 100A, or concurrent instructor; concurrent enrollment in 130. Study of the structure and function of vertebrates; analysis of patterns of evolution of vertebrates using morphological data and the comparative method. (SP) Staff

131. General Human Anatomy. (3) Three hours of lecture per week. Prerequisites: Biology 1A-1B or Chemistry 1A. Formerly Anatomy 108. The functional anatomy of the human body as revealed by gross and microscopic examination. Designed to be taken concurrently with 131L. (F) Diamond

131A. Applied Anatomy. (1) Course may be repeated once for credit. One hour of lecture per week. Must be taken on a passed/not passed basis. A series of 15 lectures by former students of 131 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, etc. (F) Diamond

131L. General Human Anatomy Laboratory. (2) Four hours of laboratory per week. Prerequisites: Biology 1A, 1B; or Chemistry 1A, 1B. (may be taken concurrently with 131 or following 131 required). Formerly Anatomy 108L. Prepared human dissections, models and microscopic slides. (F) Diamond

132. Survey of Human Physiology. (3) Students will receive no credit for 132 after taking Physiology 100 or 101 or Molecular and Cell Biology 32. Three hours of lecture and one hour of discussion/film per week. Prerequisites: 131. Mechanisms of human life processes; study of function of cells, tissues, and organ systems. (SP) Staff

132D. Discussion Sections on Human Physiology. One hour of discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Should be taken concurrently with 132. Material covered in lectures in 132 will be discussed and clarified as needed.
Unannounced quizzes will be given throughout the semester. (SP Staff)

132L. Mammalian Physiology Laboratory. (2) Students will receive no credit for 122L after taking Molecular and Cell Biology 32L or 32L, unless it is followed by a course in mammalian physiology. Prerequisites: A or B grade in 131L. Formerly Anatomy 197. The purpose of the course is for University students to teach human anatomy to grades K-7 in the public schools. The UCB staff will set up a series of six hours per week arranged. Must be taken on a pass/no pass basis. Prerequisites: A or B grade in 131L. (SP Diamond)

133. Anatomy Enrichment Program. (2) Course may be repeated for credit. Fieldwork—minimum of four hours per week arranged. Must be taken on a pass/no pass basis. Prerequisites: A or B grade in 131. Formerly Anatomy 197. The purpose of the course is for University students to teach human anatomy to grades K-7 in the public schools. The UCB staff will set up a series of six hours per week arranged. Must be taken on a pass/no pass basis. Prerequisites: A or B grade in 131. (SP Diamond)

134. Principles of Integrative Morphology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100B, Biology 1A-1B, upper division standing, Concepts, issues, and practical approaches to analysis of design in living and fossil organisms. This course examines the fundamental question of form in terms of four approaches of eight approaches to the study of structural diversity: descriptive morphology, comparative morphology, developmental morphology, functional morphology, constructional morphology the evolutionary morphology. Examples from model systems and strong emphasis on the need for a pluralistic science of form integrating the disparate sub-disciplines. (SP Staff)

135. The Mechanics of Organisms. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Senior standing, Biology 1A-1B, and consent of instructor. Functional morphology in terms of mechanism: basics of form and function in mechanistic analysis with examples of their biological implications, stressing the dependence of mechanical behavior on the structure of molecules, tissues, structural elements, whole organisms, and habitats. (SP Koehl)

137. General Endocrinology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B, human physiology (132) 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 reproduction, metabolism, water balance, growth, fetal development. Experimental and clinical aspects will be addressed. (F Hayes)

140. Biology and Sociobiology of Human Reproduction. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: A course in physiology (e.g., 132, Molecular and Cell Biology 32, or consent of instructor). Evaluation of human reproduction; sexual selection and techniques of human anatomy and physiology of reproductive organs, endocrinology of the menstrual cycle; puberty, psycho-physiology of copulation and orgasm; fertilization and implantation in females and males; genetics; conception and contraception; pregnancy and abortion; birth and lactation; sexual differentiation of brain and reproductive organs; homosexuality and transsexuality. (F Staff)

C142. Introduction to Human Osteology. (6) Six hours of lecture and fourteen hours of laboratory per week. Prerequisites: Anthropology 1, Biology 140, 142, 160 recommended. An intensive study of the human skeleton, reconstruction of individual and population characteristics, emphasizing methodology and analysis of human populations from archaeological contexts; introduction to use of osteological and paleodemographic statistics. Also listed as Anthropology C103. (SP White)

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 of consent of instructor; a course in mammalian physiology recommended. Neural and endocrine mechanisms underlying behavior, especially reproduction, of non-human mammals. Process of sexual discrimination in behavior. Also listed as Psychology C116. (SP Staff)

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. Neural and endocrine mechanisms underlying behavior, especially reproduction, of non-human mammals. Process of sexual discrimination in behavior. Also listed as Psychology C116. (SP Staff)

C144. Animal Behavior. (4) Students will not receive credit for C144 after taking 145. Three hours of lecture, one hour of discussion, and one hour of demonstration per week. Prerequisites: Biology 1A-1B or Environmental Science, Policy, and Management 140. Molecular and Cellular Biology 140 or 142, 140 recommended. An introduction to the study of animal behavior and the behavioral physiology in an evolutionary context, including but not limited to analysis of behavior, genetics and development, learning, aggression, reproductive behavior, social behavior, and physiological substrates. Two midterm exams and a laboratory term paper. Also listed as Psychology C115B. Offered even-numbered years.

146. Behavioral Ecology. (3) Students will receive no credit for 144 after taking 146. Two hours of lecture and two hours of laboratory per week. Prerequisites: 144 or consent of instructor. An in-depth examination of the ecological and evolutionary bases for behavioral diversity. Topics include the evolution of adaptable behavior and its impact on behavior, game theory, patterns of parental care, mating systems, group living, and cooperative behavior. Labs introduce methods of data collection used in behavioral research. Two midterms plus a term paper. Offered alternate years. (SP Staff)

C147. Neuroethology. (3) Three hours of lecture per week. The course will cover a range of topics that span the gap between the properties of individual molecules and complex cognitive behavior, including: the cellular properties of single nerve cells, synapses, pattern generating circuits, sensory and motor integration, sensory processing, escape responses, animal communication, and learning. Also listed as Psychology C115C. (SP Dickinson)

148. Comparative Animal Physiology. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B. Comparative study of physiological systems among animal phyla. General physiological principles will be illustrated by examining cardiovascular, respiratory, digestive and osmoregulatory systems.

149. Molecular Approaches to Behavior and Ecology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100B or consent of instructor. Analysis by examination of the molecular genetic tools used in behavioral and ecological research. Techniques considered include DNA fingerprinting, DNA sequencing, and microsatellite analyses.

150. Physiological Ecology of Animals. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B or equivalent. Formerly Zoology 128. Comparative animal physiology with emphasis on the various aspects of the animal physiology. Offered alternate years. (SP Lacy, Montz)

150L. Animal Physiological Ecology Laboratory. (3) Six hours of laboratory and one hour of discussion per week. Prerequisites: Consent of enrollment in 150. Consent of instructor. Consent of instructor. Formerly Zoology 178. An introduction to the measurement of physiological responses to environmental stresses.

151. Plant Physiological Ecology Laboratory. (1) Three hours of laboratory per week, plus one weekend field trip. Prerequisites: Consent of enrollment in 151 or consent of instructor. An introduction to the techniques and experimental approaches of plant physiological ecology, using modern equipment. The course will then use the experimental approaches learned in the first term to address an unresolved question: What are the interrelated suite of physiological traits which enable plants to adapt to California’s diverse environments?

152. Marine Pollution. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. The environmental fate and effects of human wastes, particularly toxic chemicals, in estuarine and coastal systems. Course will review waste types, principal sources, their impacts on marine communities, monitoring approaches, and regulatory issues. (SP Weston)

153. Population and Community Ecology. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1B or consent of instructor. Principles of marine 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 and elementary calculus. Discussion section will review recent literature in ecology. (F Staff)

153L. Laboratory in Population and Community Ecology. (3) Eight hours of laboratory per week, plus two or three weekend field trips. Prerequisites: 153L or consent of instructor. Consent of instructor. An introductory course in statistics strongly recommended. Introduction to field and laboratory study of ecological patterns and processes in nature. Course begins with descriptive analysis and proceeds to univariate data analysis of rates and processes. The course is devoted to independent research projects. A written report and class presentation of research projects are required. (F Sousa)

154. Plant Population and Community Ecology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B. Students may take the lecture without enrolling in the lab, but if
students wish to enroll in the lab, they must sign up for the lecture course. An in-depth consideration of the principles of plant ecology at the population and community levels. Topics include plant population dynamics, life histories, species interactions, and community structure and development. Readings and supplementary information will be discussed in a one-hour discussion section each week. Enrollment limited to 40. (SP) D’Antonio

154L. Laboratory in Plant Population and Community Ecology. (3) Six hours of laboratory per week and two or three 1-day field trips. Prerequisites: Biology 1A-B. Must be taken concurrently with 154. Laboratory for 154. (SP) D’Antonio

C156. Principles of Conservation Biology. (3) Two hours of lecture and one and one-half hours of discussion per week. Prerequisites: Biology 1A-B and prerequisite equivalent. A survey of 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 examined. 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. (F) Staff

157L. Ecosystems of California. (4) Six hours of fieldwork per week. Prerequisites: Biology 1B or consent of instructor. Formerly 155L. In this field-oriented course, participants represent the diverse grassland, chaparral, scrub land, forest, desert, river, marsh, and intertidal ecosystems of California. We will spend up to three weeks studying one or two habitat types thorough at a given field site. Our first week will introduce students to the natural history and ecological patterns at sites. During a second meeting on campus, we will give a 1.5 hour lecture and lead a 2 hour discussion on ecological issues relevant to processes and patterns exemplified at a given site. Methods for field investigations will also be discussed and demonstrated. During our third meeting, we will revisit the site, and students will present data that they hypothesize about processes influencing species distributions and abundances. Course requirements will include a research proposal in National Science Foundation format, which presents field results as seen data, develops a program for subsequent investigation of problems uncovered by preliminary results, and justifies the importance of the proposed research with discussion of the literature. A final oral presentation in a class symposium is required. (SP) Staff

C158. Biology and Geomorphology of Tropical Islands. (13) Nine hours of lecture for 6 weeks; field projects for 6 weeks; three hours of lecture for 3 weeks. Natural history and evolutionary biology of island terrestrial, freshwater, and marine organisms is studied. 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 Geograph C142 and Environ Sci, Policy, and Management C107. (SP) Staff

160. Evolution. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B; Molecular and Cell Biology 140 or equivalent. Formerly Zoology 105. A course in evolutionary theory, with emphasis on basic processes: selection, gene flow, adaptive responses, and patterns of speciation and phylogeny. (F) Wakin

161. Evolutionary Genetics. (4) Three hours of lecture and two hours of computer laboratory per week. Prerequisites: Biology 1A-1B and Mathematics 164. An introduction to genetics and its application to problems in evolutionary biology. Applications will include the evolutionary consequences of inbreeding, the geographic structure of populations, sexual selection, speciation, kin and group selection, the neutral mutation theory, coevolution, the evolution of sex and recombination, and the evolution of mating systems. Computer laboratory exercises will include the use of simulation programs for exploring evolutionary dynamics and the analysis of DNA sequence and other genetic data. (SP) Staff

162. Ecological Genetics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B. This course will bridge the gap between ecology, genetics, and evolutionary biology. It will present the important concepts of evolutionary theory in the context of natural populations, and use models to predict evolution in natural populations. Case studies will be used to examine evolutionary responses of ecological interactions among species (introducement, competition, predation) to environmental change, and interactions among populations through migration and dispersal. (F) Sims

164. Human Population Genetics. (4) Three hours of lecture and two hours of computer laboratory per week. Prerequisites: Molecular and Cell Biology 140, 142, or equivalent course in general genetics. An introduction to genetic and population genetic principles that are relevant to understanding human populations. Among the topics discussed will be pedigree analysis, mapping of simple and complex genetic diseases, the analysis of human genetic diversity and genetic fingerprinting, the histocompatibility (HLA) loci, multigene families, chromosomal abnormalities, and mitochondrial genomes. Offered alternate years. (SP) Staff

165. Molecular Evolution. (4) Three hours of lecture and two hours of computer laboratory per week. Prerequisites: Biology 1A-1B. This course will cover both the evolution of the gene and the use of molecular markers for phylogenetic reconstruction. Topics covered will include the evolution of multigene families, rates and patterns of nucleotide evolution and evolution of genome size, and average nucleotide content.

166. 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 systemsatics. An outline of the major group of vascular plants and their evolution. (SP) Baldwin

168L. Systematics of Vascular Plants Laboratory. (2) Six hours of laboratory per week. Prerequisites: Biology 1A-1B. Must be taken concurrently with 168. A laboratory course devoted to a survey on a world-wide basis of vascular plant families. (SP) Baldwin

173. Mammalogy. (2) Two hours of lecture per week. Prerequisites: 104. Must be taken concurrently with 173L. Formerly Zoology 163. An advanced lecture course in the biology of mammals. (F) Staff

173L. Mammalogy Laboratory. (3) Six hours of laboratory per week, plus two 3-day field trips. Prerequisites: 104. Formerly Zoology 183. An advanced laboratory and field course in the biology and diversity of mammals. (F) Staff

174. Ornithology. (2) Two hours of lecture per week. Prerequisites: 104 or consent of instructor. An advanced course in the biology of birds. (F) Johnson

174L. Ornithology Laboratory. (2) Six hours of laboratory per week, plus one weekend field trip. Prerequisites: 104. Must be taken concurrently with 174L. Formerly Zoology 165. A survey of the diversity, morphology, and general ecology of birds of the world. (F) Johnson

175. Herpetology. (2) Two hours of lecture per week. Prerequisites: 104. Must be taken concurrently with 175L. Formerly Zoology 165. Lectures and assigned readings will introduce students to the diversity of amphibians and reptiles on a world-wide basis, with emphasis on behavior, ecology, functional morphology, and evolutionary history. Grade is based on two examinations (midterm and final) and an independent research paper. (SP) Staff

175L. 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 diagnostic characteristics and some functional attributes of amphibians and reptiles on a world-wide basis. Field trips will acquaint students with techniques for collecting, preserving, identifying, and studying amphibians and reptiles. (SP) Staff

176. Ichthyology. (3) Three hours of lecture per week. One midterm exam and a library term paper. Prerequisites: 130 and 140 recommended to be taken concurrently with 176L. Biology 1A-1B and consent of instructor. An advanced course in the biology of fishes. Students learn about the diversity of marine and freshwater fishes, their phylogeny and radiations, major features of their life history such as locomotion and schooling, migration, mimicry, symbiosis, reproduction, and mating systems, and different kinds of fishes in reborn and natural environments. Offered even-numbered years. (F,SP)

176L. Laboratory in Ichthyology. (3) Six hours of laboratory per week, plus three field trips. Prerequisites: 176 (may be taken concurrently) and consent of instructor. Formerly Zoology 186. An introduction to the diversity of fishes, with emphasis on local species, and functional aspects of fish biology.

180. Micropaleontology. (2) Two hours of lecture per week. Prerequisites: 182 and 182L; a course in Marine Geobiology is recommended. Must be taken concurrently with 180L. Formerly lecture portion of Paleontology 115. Marine Protista are common in the fossil record and will be discussed; this includes planktonic, benthonic and larger foraminifera, diatoms, radiolarians, dinoflagellates, and cocolithophores. The biology, ecology, deposition, preservation, and petrographic significance will be discussed, and special research applications of each group will be considered.

180L. Micropaleontology Laboratory. (3) Six hours of laboratory per week. Prerequisites: 182 and 182L; 185 recommended. Must be taken concurrently with 180. Formerly laboratory portion of Paleontology 115. Laboratory demonstrating and studying marine Protista of the fossil record, including planktonic benthonic and larger foraminifera, diatoms, radiolarians, dinoflagellates, and cocolithophores. Taxonomy, evolution, stratigraphy, biogeography, paleoecology, preservation, and research applications will be the focus.

181. The Evolution of Plants in Geologic Time. (3) Three hours of lecture per week. Prerequisites: Courses in botany, ecology, and geology are recommended. This course considers the evolution of photosynthetic organisms within the context of changing environments. We begin with the origin of photosynthesis, consider how plants made the transition to land, and follow the evolution of major plant groups. We examine ancient plant communities, and how environmental change affected their evolution. (F) Arens

181L. The Evolution of Plants in Geologic Time—Laboratory. (1) Three hours of laboratory per week and one full-day field trip. Prerequisites: 181L recommended. Must be taken concurrently with 181L. This is the laboratory that accompanies 181. We will examine the fossil evidence on which conclusions drawn in lecture are based. Laboratory will stress paleobotanical technique and familiarity with fossils of the major groups of land plants. (F) Arens

182. Invertebrate Paleontology. (2) Two hours of lecture per week. Prerequisites: Must be taken concurrently with 182L. Formerly Invertebrate Paleontology 111. Laboratory in invertebrate geobiology, with practical study of their uses in ecosatigraphy and chronostratigraphy.

182L. Invertebrate Paleontology Laboratory. (3) Six hours of laboratory per week. Prerequisites: Must be taken concurrently with 182L. Formerly laboratory portion of Paleontology 111. Laboratory in invertebrate paleobiology, with practical study of their uses in ecosatigraphy and chronostratigraphy.

183. Evolution of the Vertebrates. (3) Must be taken concurrently with 183L. Three hours of lecture per week. Prerequisites: Biology 1A-B and prerequisite equivalent. 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, func-
tional morphology, faunas through time, and problems in vertebrate history, including diversity through
time and extinction. Offered alternate years. (F) Clemens, Padian

183. Laboratory in Vertebrate Evolution. (1) Must be taken concurrently with 183. Two hours of laboratory
time per week. Prerequisites: Biology 1B or Anthropology 1. Must be taken concurrently with 184. Lectures on comparative os-
teology of vertebrates, with emphasis on selected
groups of terrestrial vertebrates considered in pale-
ocological, paleoclimatological and biostatigraphic analyses. Offered alternate years. (F) Staff

184. Laboratory on the Vertebrate Skeleton. (2) Two hours of lecture per week. Prerequisites: 30, 33, or 34, Biology 1B or Anthropology 1. Must be taken concurrently with 184L. Lectures on comparative os-
teology of vertebrates, with emphasis on selected
groups of terrestrial vertebrates. Structure, anatomy, mor-
phology, function, and development of the vertebrate skeleton. Offered alternate years. (F) Staff

C185. Human Paleontology. (5) Three hours of lecture and three hours of laboratory per week. Prereq-
usites: Human Paleontology 1 and Anthropology 2. Anthropology 100 or In-
termediate or advanced level courses in earth history and vertebrate zoology rec-
ommended. Formerly Botany 222. Undergraduate research by small
groups. (F,SP) Valade

200A. Principles of Phylogenetics: Systematics. (4) Three hours of lecture and three hours of laboratory per week. The core theory and methodology for phy-
logenetic systematics on long-term evolution, including the use of phylogenetic methods for reconstructing the history of life on earth; with emphasis on selected
tree-building tools and their applications. Offered alternate years. (F) Staff

200B. Principles of Phylogenetics: Ecology and Evolution. (4) Three hours of lecture and three hours of laboratory per week. The use of phylogenetic trees in ecology and the study ecology of a variety of organisms and ecosystems. Offered alternate years. (F) Staff

210L. Pteridology. (1) Three hours of laboratory per week. Prerequisites: Concurrent or pre-
A
erature concerning the biology of amphibians and reptiles. (F,SP) Staff

235. Biology of Fishes. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 176 or consent of instructor. Formerly Zoology 286. Topics vary from year to year depending on the group being studied. The additional aspects of fish biology, such as behavior, physiology, ecology, zoogeography, evolution and fish as a resource.

236. Seminar in Avian Biology. (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. Formerly Zoology 276. Reviews of original research and recent literature.

237. Advanced Studies in Morphology. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and consent of instructor. Formerly Zoology 206. Current problems, questions, and techniques in morphology. Topics will vary from year to year.

238. Advanced Mammalian Biology 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: Graduate standing or consent of instructor. Formerly Zoology 264. Discussion of mammalian biology in an interdisciplinary context.

239. Seminar in Reproductive Biology. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Formerly Zoology 264. Presentation and discussion of current research and literature in reproductive biology.

240. Endocrine Disruptors. (3) Three hours of lecture per week. This course will examine intentional endocrine disruption, such as the use of pharmaceuticals to regulate hormones in humans, livestock, and wildlife. We will be evaluate 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. Formerly Anatomy 203. 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. Formerly 245 and Anatomy 203. Histological examination of the human nervous system; gross dissection of the human brain. (SP) Diamond

247. Seminar on Controversies in Comparative Physiology. (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 Zoology 232. Topics to vary. Read and discussion of current literature. (F) Full

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. (F,SP) Staff

249. Seminar on Evolutionary Genetics. (1) Course may be repeated for credit. One hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Zoology 249. Recent developments in evolutionary genetics will be discussed in a seminar format. (F) Saltkin

250. Seminar in Ecology. (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 Zoology 264. Reports and discussions of original research. (F,SP) Staff

252. Special Topics in Ecology. (3) Three hours of lecture per week. Prerequisites: 153 or consent of instructor. Formerly 273. This course will focus on the ecology of particular habitats or on current conceptual issues. This course is being created to treat material in greater depth than in 153 with particular emphasis on recently published research.

253. Advanced Topics in Theoretical Ecology. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Discussion of recent theoretical topics in population, community and ecosystem ecology. Emphasis will be placed on quantitative techniques for developing and analyzing ecological models and on experimental approaches to testing the predictions of theory. (SP) Briggs

254. Topics in History of Ecology. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 153 or 154 or consent of instructor. Readings and discussion of recent literature emphasizing historical background of concepts in community and population ecology.

255. Seminar in Marine Biology. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Formerly Zoology 229. Topics to vary.

256. Methods in Ecology and Environmental Biology. (3) One hour of laboratory per quarter. Prerequisites: Course work in biology or consent of instructor. This course will introduce students to the diversity of methods and techniques used in ecology and environmental biology. It is a survey of major areas of research such as environmental science, population and community ecology, environmental physiology, and ecosystem ecology. In particular, we will discuss the processes that influence the relationships between the biosphere and the atmosphere and the effects of anthropogenic changes, the components and functions of biodiversity, the interactions among organisms and between organisms and their environments, and the major biogeochemical cycles. Each topic will be analyzed from a theoretical and an empirical - practical perspective during the weekly sessions. (F) Mambelli

257. Current Topics in Behavioral Physiology. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 145 or consent of instructor. Topics to vary. Read and discussion of current literature.

257A. Symposium in Behavioral Ecology. (1) One hour of lecture per quarter. This course is intended to focus on field trips to Hastings Reservation. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Students will each select a related topic in the field of behavioral ecology and explore in detail the current issues of interest and point of view for further study. Oral presentation focusing on chosen topics will be presented during a weekend symposium at Hastings Reservation. Discussions include numerical techniques, statistical analysis, theoretical basis, implications, and further directions related to the selected problem. (SP) Koening

259. Advanced Paleocology. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Formerly Paleontology 243. Topics vary from year to year but will include paleocology of major groups of organisms or major environments from population, community evolutionary, or ecological perspective. (SP) Staff


263. Topics in Ecology and Evolutionary Biology. (1) Course may be repeated for credit. One hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Botany 253. Analysis of the primary literature in ecology and evolutionary biology. Topics vary from semester to semester.

264. Seminar in Evolutionary Biology of the Vertebrates. (1) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing; consent of instructor. Formerly Zoology 260. Presentation of results of original research by students, faculty, and visitors. (F,SP) Staff

265. Human Evolution. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Formerly Paleontology 246. Study of fossil record of Mammalia; comparative research on modern animals contributing to determination of mammalian phylogenetic relationships. A field trip will provide experience with collecting techniques. Offered alternate years. (SP) Staff

267. Evolution and Systematics of Mammals. (2) Two hours of lecture per week and one weekend field trip. Prerequisites: 183, 183L, 184, 184L, and 160 or equivalent. Must be taken concurrently with IB 267L. Formerly Paleontology 226. Study of fossil record of Mammalia; comparative research on modern animals contributing to determination of mammalian phylogenetic relationships. A field trip will provide experience with collecting techniques. Offered alternate years. (SP) Staff

268. Seminar in Evolution about 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 paleontological data. Offered alternate years. (SP) Staff

271. Modeling Ecological and Meteorological Phenomena. (3) Three hours of lecture per week. Prerequisites: Energy and Resources 102 or consent of instructor. Modeling methods in ecology and meteorology; stability analysis; effects of anthropogenic stress on natural systems. Alternating years. Also listed as Environ Sci, Policy, and Management C211 and Energy and Resources Group C202. (SP) Powell

272. Ecological and Social Dimensions of Global Change. (2) One and one-half hours of discussion and a non-student seminar presentation. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Maximum enrollment 25. This seminar will explore the possible social and ecological impacts of global change, focusing on ecological and economic tradeoffs associated with the following human responses to global change: adaptation, prevention, and no response. Emphasis is placed on developing a quantitative model of how the Earth System (including humans) will respond to global change. Also listed as Geography C244, Energy and Resources Group C291, and Environ Sci, Policy, and Management C212.

273. Fossil Hominids. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Anthropology C206.

280. Seminar in Paleontological Research. (1) One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing; consent of instructor. Presentation of results of original research by students, faculty, and visitors. (F,SP) Staff

281. Seminar in Evolution. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Advanced study and current literature in recent fields of evolution. Topics vary from year to year.

282. Paleontology and Evolution of Amphibians, Reptiles, and Birds. (4) Four hours of lecture per week. Prerequisites: 183, 183L, 184, 184L, and 160 or equivalent. Formerly Paleontology 225. Evolution, systems, functional morphology, and paleontology of
the nonmammalian land vertebrates, with emphasis on the Mesozoic Era. Must be taken concurrently with 282L. Offered alternate years.

282L. Laboratory in Paleontology of Amphibians, Reptiles, and Birds. (2) Four hours of laboratory per week. Prerequisites: 183, 183L, 184L, 160 or equivalent. Study of the paleontology of nonmammalian tetrapods, illustrated from the collections of the Museum of Paleontology. Must be taken concurrently with Integrative Biology 282L. Offered alternate years.

283. Seminar in Vertebrate Evolution and Paleontology. (1) Enrollment is restricted; see the introduction to Courses and Curricula section of this catalog. One hour of seminar per week. Prerequisites: 183, 183L, or consent of instructor. Presentations and discussions of original research and new literature in the vertebrate evolution and paleontology. Syllabus and reading list will vary as topics change from semester to semester. Open to Undergraduate students with permission. Enrollment limit: 25 (SP) Staff

284. Advanced Stratigraphic Paleontology. (2) Course may be repeated for credit. Two hours of seminar per week. Formerly Paleontology 240. Topics may vary from year to year but include evaluations of current literature and discussions aimed at refinement of paleontologic disciplines in stratigraphy and geochronology, emphasizing established scientific principles, global tectonics, evolutionary biological theory.

285. Advanced Marine Micropaleontology. (2) Course may be repeated for credit. Two hours of seminar per week. Formerly Paleontology 245. Environments and history of foraminifera, radiolarians, diatoms, nanofossils and other marine microfossils.

286. Seminars in Paleontology. (2) Course may be repeated for credit. Two hours of seminar per week. Formerly Paleontology 250. Advanced study and current literature in various fields of paleontology. Topics vary from year to year. (SP) Staff

288. Seminar in Plant Ecology. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Topics will vary each semester.

289. Tropical Biology—An Ecological Approach. (B) Ten 1-hour lectures and 30 hours of laboratory per week. Prerequisites: Graduate standing in a biological discipline and a course in general ecology or consent of instructor. Formerly Biology 250. Evolution and dynamics of tropical biota, their relationships to tropical environments. Offered on a credit/no credit basis. (F,SP) Staff

290. Research Seminar. (1) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/un satisfactory basis. Formerly Paleontology 290. Advanced study in various fields of Integrative Biology. Topics will be announced in advance of each semester. Enrollment in more than one section permitted. (F,SP) Staff

291. Research Seminar. (1) Course may be repeated for credit. Two hours of seminar for seven and one-half weeks. Must be taken on a satisfactory/un satisfactory basis. Formerly Anatomy 390, Cell Biology 390. Review and discussion of topics of current interest. Topics to vary. (SP) Staff

292. 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

293. Concepts and Principles in Integrative Biology. Formerly Zoology 281. Two hours of seminar plus workshops per week. Course may be repeated for credit. Formerly Zoology 391. Must be taken on a satisfactory/un satisfactory basis. Prerequisites: Graduate standing. First-year graduate students are expected to attend. Discussion by faculty members of their papers reflecting integration in biology.

294. Special Study for Graduate Students. (1-4) Course may be repeated for credit. Individual conferences. Formerly Zoology 294. Reading or other advanced study by arrangement with a staff member. (F,SP) Staff

295. Concepts and Principles in Integrative Biology. (2) Course may be repeated for credit. Formerly Zoology 295. Must be taken on a satisfactory/un satisfactory basis. Formerly Paleontology 297. Open to qualified students directly engaged in field studies. (F,SP) Staff

296. 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

297. Directed Field Studies. (1-8) Course may be repeated for credit. Field work. Must be taken on a satisfactory/un satisfactory basis. Formerly Paleontology 297. Open to qualified students directly engaged in field studies. (F,SP) Staff

298. 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

299. Graduate Research. (1-12) Course may be repeated for credit. Individual study. Must be taken on a satisfactory/un satisfactory 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. (1-6) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/un satisfactory basis. Formerly Paleontology 601, Zoology 601. Individual study for the comprehensive requirements in consultation with the major advisor. 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. (1-6) Course may be repeated for credit. Course does not satisfy unit or residence requirements for doctoral degree. Individual study. Must be taken on a satisfactory/un satisfactory basis. Formerly Paleontology 602, Zoology 602, Botany 602, Physiology 602, Anatomy 602. Individual study in consultation with the major advisor. Units may not be used to meet either unit or residence requirements for the Ph.D. (F,SP) Staff

301. Preparation in Graduate Teaching. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/un satisfactory basis. Formerly Zoology 301, Paleontology 395. Designed for graduate student instructors. Discussion of questions and problems in the GSI’s practice of teaching, and of current literature on theories and methods of science teaching at the university level. (F,SP) Staff

302. Practice of Teaching Integrative Biology. (2) Course may be repeated for a maximum of 4 units. Weekly conference with instructor and teaching hours as assigned. Must be taken on a satisfactory/un satisfactory basis. Formerly Zoology 302, Physiology 302, Anatomy 302. Teaching laboratories, discussions, and/or field sections for an Integrative Biology or IDS course; analysis of specific format and problems.

303. Teaching Colloquium: Graduate Student Instructor Training. (2) Two hours of seminar plus workshops per week. Must be taken on a satisfactory/un satisfactory basis. Series of workshops and seminars involving graduate students and faculty participation. The main objectives of this course are to train graduate students to become effective instructors and to discuss important issues that graduate students face when teaching undergraduate classes. (F) Staff

304. Dissemination of Research: Your Interface with the Public. Three hours of lecture per week. This course will consist of lectures by faculty and guest lecturers. Each topic will also have a project associated with it. These projects will be done by teams of students and will count toward the Science Communication requirement for the Stable Isotope certificate program. Students are expected to prepare outreach materials (e.g., posters, newsletters, web pages), prepare a grant for information dissemination, and practice as a prospectus for private or corporate support, and prepare an evaluation program. (F) Lindberg

400. Training in Stable Isotope Methods and Mass Spectrometry. (1) Three hours of lecture and laboratory training per week. Must be taken on a satisfactory/un satisfactory basis. Prerequisites: Consent of instructor. An intensive 20-week course on the fundamental principles and practical applications of stable isotope methods in biogeochemistry, ecology, physiology, and environmental science. Topics covered are sample preparation, operation of an isotope ratio mass spectrometer, and analysis of stable isotope data. This course is required for all students interested in using the facilities housed in the Center for Stable Isotope Biogeochemistry for their research. (F,SP) Dawson

402. Histological Technique. (2) Four hours of lecture and individualized laboratory instruction. Must be taken on a satisfactory/un satisfactory basis. Prerequisites: Consent of instructor. Instruction in basic principles and techniques of histology, including but not restricted to fixation, embedding, sectioning, staining, certain special techniques, and microscopy.

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 Physical Education C407. (SP) Hayward

Interdepartmental Courses

IDS 282. Tumor Biology Seminar. (1) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/un satisfactory basis. Prerequisites: Consent of instructor. Reviews and reports of current research in tumor biology. Sponsoring departments: Integrative Biology and Molecular and Cell Biology.

Interdepartmental Studies

Interdepartmental Studies (Special Studies)

The following courses, sponsored by two or more departments because the content of each course transcends the boundaries of individual departments, are considered Interdepartmental Studies. Each class is taught by one or more instructors who represent the departments sponsoring the class. For further information, please 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 departmental course listings for further information.

Lower Division Courses


2. Environmental Physics. (3) Three hours of lecture and one hour of discussion per week. Elementary concepts of physics with application to problems of environment, energy, pollution, biology, geology. Specific examples of the role of physics in contemporary social issues. Sponsoring department: Environmental Science, Policy, and Management. (F) Staff
Upper Division Courses

100. History of American Technology. (4) Four hours of lecture per week. Survey of American technology from colonial times to the present. Analysis of technical innovation in its cultural, economic, and political setting. Topics include the Industrial Revolution, technology and the environment, and the uses of science in technology. (3) Course may be repeated for credit. Two hours of laboratory per week. (Prerequisites: Math 110 or Math 110L.) (Opt.)

100AC. Technology and the American Experience. (4) Three hours of lecture and one hour of discussion per week. The history of technology in America and the place of technology in the experience, philosophy, and culture of different American groups. The technological contributions and dilemmas of Native Americans and of European Americans before 1700. Technological clashes, transfers, and dialogues between different American cultures. Technology and the republic and pastoral ideals. The relationship of slavery and technology. The industrial and agricultural revolutions: winners and losers. Immigration and technological progress in the 20th century. Digital technology and the global village. Sponsoring departments: Engineering Interdisciplinary Studies and History. This course satisfies the American cultures requirement. (SP)

110. Introduction to Computers. (4) Three hours of lecture and four hours of laboratory per week. Formerly 110 and 110L. An introduction to computers and digital technology and its conceptual foundations, functions and computer hardware and software. Structure and use of the Internet. Elements of programming for the World Wide Web. Students will complete a substantial programming project related to their academic interests. Students who have completed either the “computer science service courses,” at Berkeley, will receive at most one unit of credit for 110, and may receive no more than one unit of credit for 110 and 110L. For more information, see the note on “Computer Science Service Courses” in the departmental listing for Electrical Engineering and Computer Sciences, and/or consult with the instructor. (F,SP) Staff

114A-114B. Advances in Aging. (2,2) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: High school biology and chemistry. This interdisciplinary course will single out specific topics in aging of great current interest and present lectures on several aspects of each topic (biomedical, health, socio-economic, legal, and ethical). Each semester a different topic will be presented. Invited speakers with special expertise in these areas will participate. Sponsoring departments: Molecular and Cell Biology, Optometry, Public Health, and Social Welfare. (F,SP) Timiras

130. Seminar on Social, Political, and Ethical Issues in Science and Technology. (2) One hour of lecture and one hour of discussion per week. Must be taken on a pass/not passed basis. An interdisciplinary approach to health and medicine. Guest lecturers will speak on the social, political, and ethical aspects of health and medicine; students will then discuss and present analyses of the reading materials as well as issues raised by the speakers. Sponsoring departments: Public Health and Education. (F) Duhl

140. Technical Communication for Non-Native Speakers of English. (3) Three hours of lecture per week. Prerequisites: English 1A, or equivalent course; upper division or graduate standing. Emphasis on improving language skills and use of the rhetorical conventions of technical presentations. This course is designed to prepare non-native speakers for the more advanced work in Engineering 190. Sponsoring departments: College Writing and the College of Engineering. (F,SP)

195A-H195B. Senior Honors Thesis. (3,3) Hours to be arranged with adviser. Credit and grade to be awarded on completion of sequence. Prerequisites: Open only to honors students with an individual group major in a College of Letters and Science. The thesis will be written while a student is enrolled in IDS H195. The thesis serves to integrate and synthesize the principal theme common to the courses comprising the major. (F,SP)

Interdisciplinary Studies

Graduate Courses

213A-213B. Mathematical Economics. (3,3) Two hours of lecture per week. Prerequisites: Math 104 and Math 110 or Math 110L. Mathematical analysis of economic theory. The problems treated involve as wide a range of mathematical techniques and of economic topics as possible, including theories of preferences, utility, demand, personal probability, games and general equilibrium. This course requires at least twelve hours of work per week including outside work and preparation. Also listed as Economics 207A-207B and Math 213A-213B.

270. Workshop in Institutional Analysis. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Doctoral standing or consent of instructor. This seminar features current research of faculty, from UC Berkeley and elsewhere, and advanced doctoral students who are investigating the efficacy of economic and noneconomic forms of organization. An interdisciplinary perspective—combining aspects of law, economics, and organization—is maintained. Markets, hierarchies, hybrids, bureaus, and the supporting institutions of law and politics all come under scrutiny. The aspiration is to progressively build toward a new science of organization.

282. Tumor Biology 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. Reviews and reports of current research in tumor biology. Sponsoring departments: Integrative Biology and Molecular and Cell Biology.

294. Management of Technology Joint Learning Seminar. (3) One hour of lecture and three hours of laboratory per week. Prerequisites: Business Administration 296 or Engineering 296 or 297, or consent of instructor. Students, under the guidance of two faculty advisers (Bus. Adm. and Engr.) will assist a Bay Area corporation in a central issue in the management of technology. Applications of classroom work to the solution of real issues. Will provide an opportunity for further the student’s understanding of the scope and complexity of the technology management process. Comprehensive report and presentation required. Sponsoring departments: Engineering and Business Administration.

296. Management of Innovation and Policy. (3) Three hours of lecture per week. Prerequisites: Graduate standing in Business Administration or Engineering. This course is designed to introduce students to the innovation process and its management. It draws on a variety of disciplines and attempts to integrate them in a fashion which will generate key insights into how technology can be developed and managed. Sponsoring departments: Engineering and Business Administration.

297. Operational Management of Technology. (3) Three hours of lecture per week. Prerequisites: Graduate standing in Engineering or Business Administration. The engineering process for realizing new technologies and product concepts is a key link in the innovation chain. The engineering interface to technology sources and market requirements is addressed. An integrated approach to the tools and organizational issues in the engineering infrastructure is framed as an information management task. Management roles are focused on quality and minimizing concept-to-market time. The course does not assume specialized technical knowledge. (F) Staff

Interdisciplinary Studies (College of Letters and Science)

Field Major Office: Undergraduate and Interdisciplinary Studies, 101 Campbell, (510) 642-9320 http://www.ics.berkeley.edu/dept/isf/ Director: Renate Holub, Ph.D.

Professors

† Alan Dundes, Ph.D. (Anthropology) Renate Holub, Ph.D. (ISF) Richard E. Hudson, Ph.D. (English) Karl Lind Sander (Scandinavian)

Lecturers

Robert Ehrlich, Ph.D. Earl Kee, Ph.D. Gary P. Wren, Ph.D.

Affiliated Faculty

Nezar Al-Sayag (Architecture and Director, Center for Middle Eastern Studies) Guy Benveniste (Education) Manwell Castells (City and Regional Planning, Sociology) Jerome Feldman (Electrical Engineering and Computer Sciences) Gillian Hart (Geography and, Director, Center for African Studies) Francine Massioli (Comparative Literature and Latin American Studies) Richard Steinhardt (Molecular and Cell Biology) Pavin Varayas (Electrical Engineering and Computer Sciences)

Faculty Advisers: A list of faculty advisers is available in the main office or on the Interdisciplinary Studies web site.

Student Affairs Officer: Jain Hutzel.
semester. The lower division requirement should be completed.

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, which is available on the ISF Web page or outside 301 Campbell Hall. The World Civilization requirement must be taken for a letter grade.

Upper Division Requirements. 30 units distributed among the following:

1. Area of Concentration. A minimum of 20 units (at least six courses) drawn from at least three fields or disciplines. For further information, please see the sample areas of concentration in the ISF student handbook. Courses for this requirement must be upper division, i.e., numbered 100 or above.

2. Core Theory and Methodology Courses. Two of these courses are to be taken during the junior year. Interdisciplinary Studies 100A-100B, Introduction to Social Theory and Cultural Analysis, and/or 100C, Word and Image.

3. Thesis Requirement. ISF 190, Senior Thesis. The preparation and presentation of a senior thesis pertaining to the student’s area of concentration.

Honors Program. Upper division students who declared the major in fall 1993 and later and who have an overall grade-point average of 3.5 and a grade-point average of 3.5 in the major may, upon approval of the adviser, enroll in the honors program. (Students who declared the major before fall 1993 must have an overall grade-point average of 3.5 and a grade-point average of 3.5 in the major to be eligible.) H195 will be substituted for ISF 190. Honors candidates will submit a detailed research proposal with a preliminary bibliography to the thesis adviser. They will also obtain the prior agreement of a faculty member (in addition to the adviser) to read and evaluate the completed thesis. Requirements for graduation in the honors program include: (1) 3.5 grade-point average in all courses taken for the major and (2) a recommendation for honors based upon the high quality of the senior thesis.

Lower Division Courses

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, and people, even populations, has increased dramatically. This cross-cultural diffusion has raised complex and interesting moral issues, issues which this course seeks to explore. We will examine some of the emerging ethical issues in international affairs, with particular attention to those involving technological development. Such issues include the effect of mass media and the Internet on cultural integrity, the political and civil rights implications, ethical implications of genetic engineering, and others. In each case, the student will explore the relevant historical and empirical background as well as the salient moral and political debates. We will draw on classical, academic, and contemporary, including contemporary philosophical, perspectives, to explore the ramifications of such issues in modern culture. The goal of the course is to provide the student with a general introduction to key areas of conflict in the next century. (F,SP) Wren

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 agency in modern society. In particular, we are going to probe carefully how humans reflect on and practice the process of moral reasoning. We will focus on human behavior in extreme situations: war, politics, and philosophy, genocide and mass killings, as well as competing conceptions of human freedom. The course has a distinctive dual purpose. On the one hand we want to encourage the learning of 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 course draws on perspectives from philosophy, political theory, ethics, social psychology, jurisprudential analysis, historical-political analyses, and personal memoirs. (F,SP) Klee

Upper Division Courses

100A. Introduction to Social Theory and Cultural Analysis. (4) Three hours of lecture per week. Formerly 100. Introduction to central theoretical investigations concerning the construction and organization of society. The course works from the “classical” traditions of social theory to the contemporary development of current studies, social constructionism, critical theory, and postmodern theory. Taught in English. (F,SP) Ehrlich, Klee, Wren, Holub

100B. Introduction to Social Theory and Cultural Analysis. (4) Three hours of lecture per week. Introduction to and practice the process of moral reasoning. We will focus on human behavior in extreme situations: war, politics, and philosophy, genocide and mass killings, as well as competing conceptions of human freedom. The course has a distinctive dual purpose. On the one hand we want to encourage the learning of 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 course draws on perspectives from philosophy, political theory, ethics, social psychology, jurisprudential analysis, historical-political analyses, and personal memoirs. (F,SP) Klee

International and Area Studies / 285

International and Area Studies

(Units of Letters and Science)

Office: 101 Stephens Hall, (510) 642-4466

Program Overview

International and Area Studies attempts to enhance the educational experience at the undergraduate and graduate levels. The courses that IAS offers are interdisciplinary and internationally focused, and they address timely and relevant issues not generally covered in existing curricula. These courses are designed to be of interest to students of all majors. Since the course topics change from semester to semester, please consult with the program office regarding the current offerings.

Graduate Program

Advisors: Richard Abrams (History), Vinod K. Aggarwal (Political Science), Nazar Alsayyad (Arabic), Michael K. Borchardt (Information Management Systems), Richard Buxbaum (Law), Blair D. Cohn (Law), John Darko (Agriculture and Resource Economics), Peter Evans (Sociology), Jeffrey A. Frankel (Economics), Gillian Hart (Geography), David Leonard (Political Science), John M. Quigley (Public Policy, Economics), Robert Reed (Geography), Gene Rochlin (Energy and Resources), Jeffrey Romm (Environmental Science, Policy, and Management), David Vogel (Business), Michael Watts (Geography), John Zysman (Political Science).

M.A. Degree. The M.A. Degree Program in international and area studies is a two-year master’s degree program for students already matriculated in one of Berkeley’s professional or academic graduate programs. A broadly defined and interdisciplinary program, it is designed to complement other degree programs by providing students with the ability to apply. The courses are designed to be of interest to students of all majors. Since the course topics change from semester to semester, please consult with the program office regarding the current offerings.

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1. The Berkeley Forum on the International World. Lower Division Courses. Admission is limited to 15 students per year.

(2) Demonstrated proficiency in a modern foreign language relevant to the focus of the program of study equivalent to the completion of four college-level semesters of basic language study. None of the courses taken to fulfill this requirement can be applied toward the degree. Up to 4 units of advanced language courses, if relevant to the focus of the student’s program, may count toward the degree.

(3) A comprehensive exam or thesis based on a student’s program of courses.

How to Apply. Graduate students submit applications during the spring semester of their first year of course work at one of Berkeley’s professional schools or Ph.D. programs. Students in Ph.D. programs or professional schools requiring more than two years to complete may apply in the spring semester of their second to last year of work. Admission is limited to 15 students per year.

Lower Division Courses

1. The Berkeley Forum on the International World. (1) Course may be repeated for credit. One and one-half hours of lecture per week. Must be taken on a passed/not passed basis. Prerequisites: Freshman or sophomore standing.

2. 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.

3. Survey of World History. (4) Three hours of lecture and one hour of discussion per week. Formerly Political Economy of Industrial Societies 102. Required prerequisite for all students intending to enroll in Development Studies H195 and Political Economy of Industrial Societies H195. Introduction to interdisciplinary research methods for the collection, interpretation, and analysis of data. Course integrates the study of the fundamental theories of social science research methods. (F,SP)

Upper Division Courses

102. Scope and Methods of Research in International Studies. Three hours of lecture and one hour of discussion per week. Formerly Political Economy of Industrial Societies 102. Required prerequisite for all students intending to enroll in Development Studies H195 and Political Economy of Industrial Societies H195. Introduction to interdisciplinary research methods for the collection, interpretation, and analysis of data. Course integrates the study of the fundamental theories of social science research methods. (F,SP)

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, this offering focuses on 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 short-term visitors to campus who have considerable expertise in areas of interest to international and area studies. Topics will vary from semester to semester. (F,SP)

142. Women’s Lives Worldwide. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Formerly 142. Global influences on women’s lives have multiplied in the past decades. New laws and new economic activities have altered traditional gender relationships, not always to the benefit of women. This course will explore different regions worldwide and determine the effects of issues and topics of international and area studies. Topics change from semester to semester. (F,SP)

145. Multicultural Europe. (4) Three hours of lecture per week. This course, in which 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 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 concepts of nationhood and citizenship, and (2) a study of the Europeanization of culture. Also listed as Geography C152, History C176, and Interdisciplinary Studies C145. (F,SP)

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. Prerequisites: Consent of instructor. Advanced multidisciplinary research in current topics in international and area studies. 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)

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. Students will work in pairs and small groups, either in specific world regions or in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

199. Supervised Independent Study and Research for Undergraduates. (1-3) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Written proposal must be approved by a faculty adviser. Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalog. (F,SP)

Graduate Courses

200. Seminar in International and Area Studies. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Required course for International and Area Studies graduate students. Course includes a series of seminars and discussions by faculty and advanced graduate students focused on current research on international and area studies. Students will be responsible for readings and will prepare a research prospectus. (F)

230. Cross-Listed Topics. (1-4) Course may be repeated for credit. Variable format. Prerequisites: Consent of instructor. This course is designed to accommodate cross-listed courses offered through other departments, when the content of the courses is applicable to the graduate program in International and Area Studies. Content varies from course to course. (F,SP)

240. Special Topics. (2) Course may be repeated for credit. Three hours of lecture per week for eight weeks. Prerequisites: Consent of instructor and graduate-level standing. A short course designed to provide a vehicle to take advantage of short-term visitors to campus who have considerable expertise in areas of interest to International and Area Studies graduate students. Topics will vary from semester to semester. (F,SP)

250. Graduate Studies in International and Area Studies. (4) Course may be repeated for credit. Three hours of seminar and one hour of discussion per week. Prerequisites: Consent of instructor and graduate-level standing. Graduate multidisciplinary research in current issues and topics of international and area studies. Students 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)

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 topics. The topic should be agreed upon in advance by both the student and faculty member. The topic will generally be topics not covered in other existing course work. (F, SP)

298. Directed Group Study. (1-4) Course may be repeated for credit. Group meetings to be announced. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor and graduate-level standing. Group conferences intended to provide supervision in directed readings and research in subject matter not covered by available seminar offerings. (F, SP)

299. Directed Reading. (1-4) Individual weekly meetings to be agreed upon in advance by both the student and the faculty member. Prerequisites: Consent of instructor and graduate-level standing. Individual conferences intended to provide directed reading in subject matter not covered by available seminar offerings. (F, SP)

Professional Courses

301. Professional Training: Teaching in IAS. (2) Course may be repeated for a maximum of 8 units. Required for graduate student instructors in International and Area Studies programs for major programs for the first time, and is strongly recommended for all IASTP GSIs. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as a graduate student in International and Area Studies. This course is intended to prepare students for teaching duties in the International and Area Studies major. It will serve as a forum to discuss problems and create innovative solutions to these problems. Focusing on course 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 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) Karras

310. Workshop on IAS for K-12 and Community College Teachers. (2) Course may be repeated for credit as topic varies. One hour of lecture and one hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Taught as a 50-50 lecture/seminar course, to introduce K-12 and community college teachers to the International and Area Studies major. Lectures will cover a variety of topics relevant to the IAS major. Participants will be expected to complete group projects appropriate to teaching responsibilities. Level and quality of participation will be the basis of evaluation. (F, SP) Staff

Italian Studies
(College of Letters and Science)

Department Office: 6303 Dwinelle Hall, (510) 642-2704 http://www.is.berkeley.edu/Dept/Italian/Italian.htm

Professors

Âlvaro Fuentes, Ph.D. Cornell University. Medieval and Renaissance literature and culture
*Louise George Cliby, Ph.D. Columbia University. L.H.D. Timothy Tamashiro, Ph.D. Princeton University. Renaissance comparative literature
Anthony Newcomb, Ph.D. Princeton University. Italian madrigal, 16th-century music
Lorenzo Vettor, Ph.D. Harvard University. Italian Renaissance art
Barbara Spackman, Ph.D. Yale University. Late 19th- and early 20th-century literature and culture
Randall Starn, Ph.D. Harvard University. Early modern European and Renaissance history
Gabriel Moseley, Ph.D. University of Florence (Emeeritus)
Nicola J. Perrella, Ph.D. (Emeritus)
Ruggiero Stefani, Dottore in Lettere (Emmeritus)

Associate Professors

Steven Botterill, Ph.D. Cambridge University. Dante, literature and culture 1200-1500
Gavriel Moses, Ph.D. University of Illinois. Film and film theory, 16th- and 17th-century literature and culture, interdisciplinary poetics, comparative literature

Assistant Professor

Mia Fuller, Ph.D. University of California, Berkeley. Anthropology and history of modern Italy, colonialism, architecture and urbanism

Senior Lecturer

Catherine Feucht, B.A. (Emmeritus)

Lecturer

Armando Di Carlo, Ph.D. University of Michigan, Ann Arbor. Language program coordinator

Undergraduate Program Major Adviser: Ms. Fuller.
Graduate Adviser: Mr. Botterill.

Program Overview

The undergraduate program is designed to provide training to a high degree of fluency in reading, writing, and speaking Italian; to give students the opportunity for intensive study in Italian literature and culture from the Middle Ages to the present day; to introduce them as fully as possible to the richness and variety of the literature and art of Italy, and to extend their linguistic and literary training by exposing them to approaches drawn from other scholarly disciplines.

The graduate program offers in-depth training in the field of Italian studies, leading to the M.A. or 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 disciplinary and interdisciplinary areas, including, but not limited to, film studies; comparative literature; literary, rhetorical, and cultural theory; gender studies; history; anthropological studies; history of art and music; 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 equivalent in linguistic proficiency.

Upper Division. 32 units of upper division courses, to include Italian Studies 101A-101B, Advanced Grammar and Conversation, Intermediate Italian, or Italian Studies 103. History of Italian Culture, or Italian Studies 104 Reading Italian Literature. At least 20 units must be taken in residence. Up to 8 credits of coursework taken on a letter-graded basis. A grade-point average of 2.0 is required in upper division courses used for the major.

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 administratively distinct from the major field of study.

Lower Division. 20 units of Italian language courses to include Italian Studies 1, 2, 3, 4, Elementary/Intermediate/Advanced Italian, or their equivalent in linguistic proficiency.

Upper Division. 20 units of upper division courses, to include either Italian Studies 101A or 101B, and either Italian Studies 103 or 104. Italian Literature and Literature. At least 12 units must be taken in residence. Up to 4 credits of course work with primary readings and discussion in English may be counted toward the minor unit requirement. Such courses may be taken in other departments (e.g., History, History of Art, Music) with advance permission of the undergraduate adviser.

No more than 8 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 grade-point average of 2.0 is required in upper division courses used for the minor.

Study in Italy

Berkeley offers advanced students the opportunity of studying Italian in Padua, Venice, Bologna, or Milan. The programs for study abroad cover 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 adviser before departure. Details of the programs are available from Berkeley Programs for Study Abroad, 160 Stephens Hall, (510) 642-1586.

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

Master of Arts in Italian Studies. Requirements: Admission of 24 and 32 units in the 100 or 200 series, at least half of which must be in the 200 series (excluding Italian Studies 260 and 270) and must include Italian Studies 205 (the exact number of units required 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); demonstration of advanced reading skills in one language, other than Italian and English; and a comprehensive written examination based on a reading list agreed upon by the student and the department. Upon conferment of the M.A. degree, students who wish to enter the Ph.D. program must petition the Graduate Committee for permission to proceed. Detailed information is available from the department.

Doctor of Philosophy in Italian Studies. The Ph.D. program is open to students with an M.A. in Italian Studies or in an area program in which the literature, culture, or history of Italy was a major field of study. Requirements: Two to three years of course work in the 100 and 200 series, the exact number of units dependent on the student’s preparation (during this period, students will develop special expertise in a primary and a secondary field of Italian studies, will prepare for an exam which in their area of specialization, and will develop a dissertation topic); demonstration of advanced reading ability in at least two languages.

*Professor of the Graduate School
Recipient of Distinguished Teaching Award
other than Italian and English, which are indispen-
sable for doing doctoral research in the stu-
dent's primary and secondary fields; a written
and oral examination based on the student's primary
field and on two special topics developed in tuto-
rials during the year preceding the examination;
and completion of a dissertation. Detailed infor-
mation is available from the department.

Ph.D. in Romance Languages and Literatures
(emphasis in Italian). Prerequisite for admission:
A) Plan I: A B.A. degree with studies in Italian
approximatively equivalent to the undergraduate
major at Berkeley.
B) Plan II: A B.A. degree either in Italian, or in
linguistics with expertise in Italian and at least one
other major Romance language (French or Span-
ish). Facilities are required, but students, in consultation with a graduate adviser, will
design a program to prepare them for the qualify-
ing examination preceding advancement to can-
didacy. As early as possible, they must demon-
strate a reading knowledge of Latin, Spanish, and
French in a written examination or appropriate
course work. A reading knowledge of German is
recommended.

The precise nature of the qualifying examination
will depend on the student's choice of three alter-
native plans of preparation, each of which requires a
detailed knowledge of Italian literature and fa-
miliarity with Romance philology, with emphasis on
Italian.

Plan I further requires a knowledge of a second
Romance literature as a collateral, and of pre-
scribed masterpieces in a third Romance literature.

Plan II further requires a command of one broad,
integrated field (period, movement, or genre) in
both Spanish and French literatures.

Plan III further requires an in-depth knowledge of the
structural and historical (internal and external) of
Italian; familiarity with the history and/or structure
(depending on whether the student's preferred ori-
entation is diachronic or synchronic) of French,
Spanish, and at least one other Romance lan-
guage; study in a broadly defined field of linguistics
(phonoology, morphology, syntax, semantics, prag-
matic, 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.

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)

1G. Beginning Italian for Graduate Students. Three
hours of lecture per week. Must be taken on a satis-
factory/unsatisfactory basis. Basic grammar, reading,
and translation. (F)

2. Elementary Italian. (5) Five hours of lecture and
one hour of laboratory per week. Prerequisites: 1 or
H4A. Basic grammar for beginners: Part two. (F.SP)

2G. Advanced Italian for Graduate Students. Three
hours of lecture per week. Must be taken on a satis-
factory/unsatisfactory basis. Prerequisites: 1G or equiva-
 lent. This course is designed to develop and enhance
reading and oral comprehension skills from Italian to English, for
graduate students in departments other than Italian.
Preparation for reading knowledge and research.
A midterm and final exam are required.

3. Intermediate Italian. (5) Five hours of lecture per
week. Prerequisites: 2. Grammar review, reading, and
written compositions. (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.SP)

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 audio-visual materials
and realia. (SP) Di Carlo

24. Freshman Seminars. (1) Course may be re-
peated for credit as topic varies. Three hours of
semester 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 Berkeley Seminar Program has been
developed to provide new students with the op-
opportunity to explore an intellectual topic with a faculty
member in a small-seminar setting. Berkeley Seminaries
are offered in all campus departments, and topics vary
from department to department and semester to
semester.

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) Botterill

39. Freshman/Sophomore Seminar. Course may be
repeated for credit as topic varies. Seminar format.
Prerequisites: Priority given to freshmen and sopho-
more. Freshman and sophomore seminars offer lower
division students the opportunity to explore an intel-
llectual 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 de-
partment to department and from semester to
semester. Staff

40. Italian Culture (in English). (4) Three hours of
lecture and one hour of discussion per week. Formerly
40A-40B. An introduction to the literature and culture
of Italy through selected topics and themes integral to the history, lit-

erature, and arts of Italy from Dante to Fellini. (F.S.P) Staff

70. Italian Cinema: History, Directors, Genres. (3)
Course may be repeated for credit as topic varies.
Three hours of lecture per week. The main trends in
film history, auteurs and genres of Italian cinema.
These will be examined in their interaction with each
other and in their intersection with other cultures and
film histories. Focus will alternate between specific pe-
riods, directors, and kinds of film-making. Topic will be
announced in the semester course lists of the Italian
Department and film program. (F.S.P) Mosse

96. Directed Group Study. (1-4) Course may be re-
peated for credit. Hours to be arranged. Must be taken
on a passed/not passed basis. Group 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) Di Carlo

103. History of Italian Culture. (4) Three hours of
lecture 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 exer-
cises. 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

109. Dante's Commedia (in Italian). (4) Three
hours of lecture per week. Formerly 109A-109B. A close in-

croductory reading of Dante's Commedia. Taught in
Italian. (F.S.P) Ascoli, Botterill

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

111. Fifteenth-Century Literature and Culture. (4)
Course may be repeated for credit as topic varies.
Three hours of lecture per week. Humanism and the
Early Renaissance. (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 Re-
naissance and the Late Renaissance. (F.S.P) Staff

113. Seventeenth-Century Literature and Culture. (4)
Course may be repeated for credit as topic varies.
Three hours of lecture per week. Emphasis on the
works of Vico, Goldoni, Parini, Allieri. (F.S.P) Staff

115. Nineteenth-Century Literature and Culture. (4)
Course may be repeated as topic varies. Three hours of
lecture per week. Studies in the literature and culture
of nineteenth-century Italy. (F.S.P) Spackman

117. Twentieth-Century Literature. (4) Course may be
repeated for credit as topic varies. Three hours of
lectures, readings, and discussion per week on major au-
thors, genres, and movements in Italian literature.
(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 au-
thors, genres, and movements in Italian literature.
(F.S.P) Staff

130A. Dante's Inferno (in English). (3) 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, Botterill

130B. Dante's Purgatorio and Paradiso (in En-
glish). (3) Three hours of lecture per week. An intro-
ductive reading of Dante's Purgatorio and Paradiso.
Prior completion of Italian 130A, Inferno, is recom-
ended. Taught in English. (F.S.P) Ascoli, Botterill

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 per-
spective of social and historical forces, as articulated
by a broad variety of cultural, ideological, and institu-
tional discourses. (F.S.P)

163. Special Topics in Italian Literature. (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
in its responses to a broad spectrum of cultural, ide-
ological, and institutional forces. Taught in English or
Italian. (F.S.P) Staff

170. The Italian Cinema: History, Genres, Authors.
Course may be repeated for credit as topic varies.
Three hours of lecture and two to three hours of film
viewing, analysis, and discussion per week. An anal-
ysis of Italian cinema as seen in the development of
specific film genres such as neorealism, comedy, self-
reflexive cinema. Occasionally the course will con-
centrate on a specific director and study his/ her film-
ality through style, theme, and personal development.
This course fulfills film major requirement in one of his-
tory, genre, auteur. (F.S.P) Mosse

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 a study of out-
standing Italian film directors. Literature shaped by film
experience and films dealing with the essence of cin-
ematic form will be analyzed. This course may fulfill
the film major requirement in theory. (F.S.P) Mosse

H195. Special Studies for Honors Candidates. (3) Individual conferences. Prerequisites: 3.3 overall GPA,

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3.5 GPA in the major and must have completed at least 18 upper division units in the major. Limited to se-
nior honors candidates. Directed study relating to the
writing of an honors thesis. (F,SP)
198. Directed Group Study. (1-4) Course may be
repeated for credit. Hours to be arranged. Must be taken
on a satisfactory/unsatisfactory basis. Prerequisites: Students
must have completed 60 units and have a minimum
GPA of 2.0. Supervised group study of selected topics
not covered by regularly scheduled courses. (F,SP)
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 intro-
duction to the Course and Curricula section of this cat-
alog. (F,SP)
Graduate Courses
200. Italian Stylistics. (2,4) Students taking course
two units do not write a final paper and may enroll in
the course on a satisfactory/unsatisfactory basis. Three
hours of seminar per week. An introduction to practices
of classroom teaching per week with regular supervi-
sion of master classes. (F,SP)
201. Historical Grammar. (2,4) Three hours of sem-
inari and one hour of discussion per week. Required of all Master of Arts candidates. (SP)
Staff
C201. Linguistic History of the Romance Lan-
guages. Three hours of lecture per week. Prereq-
sities: Knowledge of at least two of the major Ro-
man languages (French, Italian, and Spanish). Formerly Romance Philosophy 200. Linguistic devel-
opment, from earliest evidence (Latin, Italian, and Spanish) from the common Latin origin. Com-
parative perspective, combining historical grammar and external history. Also listed as Spanish C202 and French C202.
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 con-
temporary criticism and an opportunity to apply critical
methods to literary texts. Oral report and a final paper. Staff
205. Prosseinari I: Italian Literary Studies. (2,4)
Students taking this course for 2 units do not write a fi-
nal paper and may enroll in the course on a satisfac-
tory/unsatisfactory basis. Two hours of seminar and one
hour of discussion per week. Course introduces the
study of Italian literature in its historical scope, while presenting the range of research interests relat-
ing to various trends in contemporary critical thought (film theory, psychoanalysis, ideological cri-
tique, discourse analysis, etc.). (F,SP)
240. 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/unsat-
isfactory basis. Three hours of seminar and two hours of laborary per week. Prerequisite:
Open to qualified seniors in the film studies pro-
gram with consent of instructor. Investigates special
topics in the theory and practice of cinema, treated in
relation to various trends in contemporary critical thought (film theory, psychoanalysis, ideological cri-
tique, discourse analysis, etc.). (F,SP) (S)
260. Directed Readings in Italian Literature and Culture. (2,4) Course may be repeated for
credit as topic varies. Assigned readings and one hour meeting per week with professor. Must be taken on a sat-
factory/unsatisfactory basis. Prerequisites: Consent of
instructor. Directed readings undertaken under the di-
rection of a faculty member of the department of Ital-
ian Studies in conjunction with an audit of a 100-series
seminar. (F,SP) Staff
290. Directed Research. (6-12) Course may be re-
peated for credit. Individual conferences. Must be taken
on a satisfactory/unsatisfactory basis. Individual study in consultation with fac-
ulty member with a view to the M.A. comprehensive examination. May be taken only in the semester of
the comprehensive examination. (F,SP)
Professional Courses
302. Practicum in College Teaching of Italian. (2-4)
Course may be repeated for credit. Three to five hours
of classroom teaching per week with regular supervi-
sion; routine evaluation conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 301.
309. Practicum in College Teaching of Italian. (2-4)
Course may be repeated for credit. Three to five hours
of classroom teaching per week with regular supervi-
sion; routine evaluation conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 301.
B prefix=language course for business majors
C prefix=course satisfies R& requirement
AC suffix=course satisfies American cultures requirement
H prefix=honor course
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
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There are courses in the history of journalism, legal aspects of the media, journalistic ethics, and the literature of journalism.

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 major division courses, of which at least 24 must be in major division courses in journalism, and must present an acceptable thesis project. Students are encouraged to take about one-third of their 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, Fellowship, and Financial Aid, available at the Office of the Dean of the Graduate Division, and in the Announcement of the Graduate School of Journalism.

The Graduate School of Journalism offers several courses for undergraduates, ranging from small writing and reporting seminars to large lecture courses.

Further information, application requirements, and copies of the Announcement of the Graduate School of Journalism are available from the Journalism Office, North Gate Hall.

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.) program provides intensive training in journalism skills and a knowledge of the traditions and principles of the field. A professional project or thesis is required to complete the two-year program. The program is rooted in the idea that the best possible preparation for careers in journalism is a sound liberal arts education followed by training in journalism at the graduate level. Concurrent degree programs with Law, Asian Studies, International and Area Studies, and the Center for Latin American Studies are available.

The school offers courses in print, broadcasting, documentary film, radio, new media, and photojournalism. All students must take a focused and demanding core course which stresses reporting and writing skills. This is because members of 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 instruction in the skills and attitudes of the craft, and intensive practice in reporting. Students give exhausitive critiques of students' work.

Beyond the core course, there are courses in specific areas, such as political, business, science, international, and cultural reporting. There are also courses using different techniques, such as investigative reporting and magazine reporting. The curriculum also includes courses in copy editing and photography and a sequence of courses in television and radio reporting.

Another group of courses is intended to increase understanding of the role of journalism in society.
213. Documentary Photography. (3) Two hours of lecture per week. An exploration of magazine photography as applied to photo essay, daily assignments and book projects, as well as content-based lectures (location lighting, environmental portraiture, etc.) and critique of student work. Required of all students in-depth assigned to include research, reporting, and photographing. Legal/ethical and business issues are explored, including funding and grant writing to support extended projects. (F,SP) Light

214. Photography Tutorial. (3-2) Two hours of lecture per week. This tutorial will emphasize the technical aspects in photography such as darkroom skills, lighting, cropping, composition, editing, and presentation. Students will be working on weekly assignments as well as a final project that would directly correlate with the material covered in class as well as to the classes taught by Ken Light. The tutorial will encourage students to explore the darkroom and to improve not only their conceptual understanding of the medium, but especially their technical, shooting, and printing, knowledge of photography. Several 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. The Photography Tutorial and its content will be of, course, to a large extent determined by the questions asked by students, their levels of experience in the medium, as well as their final goals. (F,SP) Chakarova

224. Reporting on Social Issues. (4) Three hours of lecture and eight hours of fieldwork per week. Prerequisites: For journalism students, 200 or equivalent; for others, consent of instructor. Advanced study of methods of reporting developments in such fields as science, education, health, or the environment. (F,SP) Ferris

227. Reporting of Cultural Events. (4) Three hours of lecture/discussion and eight hours of fieldwork per week. Advanced study of reporting and critical writing in such areas as film, music, fine arts, literature, and architecture. (F) Littlejohn

228. Political Reporting. (4) 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 political reporting and analysis of political events and campaigns. (SP) Rasky

230. Business Reporting. (4) 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. (MacDougal)

232. New Technology and News. (2) Two hours of lecture per week. Pursuit of current and the process of instruction. Goals of two hours of lecture and introduction to the role of technology in the news. Study of how journalists present the news standards. Individual study in journalism. M.J. candidates working on thesis projects during both Fall and Spring semesters. (F,SP) Staff

234. International Reporting—Mexico. (4) Three hours of lecture per week and a one-week reporting trip. This course is designed for students who are interested in foreign reporting. Course will include a broad range of issues that need to be re-searched when reporting on the politics, economics, and social issues of a foreign country. Course will include a one-week trip to Mexico and the production of a magazine. (SP) Chavez

236. China Reporting. (3) Three hours of lecture/discussion per week. An examination of the shifts in Western reporting on China since Edgar Snow’s classic Red Star Over China (1936). Wakeman

238. Multicultural Issues in the News Media. (3) Three hours of lecture/discussion per week. Race, ethnicity, gender, and location in the contemporary newsroom. How multicultural values are influencing news standards. Drummond

240. History of American Journalism. (3) Three hours of lecture/discussion per week. The social and political conditions that have shaped the American press from the colonial era to present. (F) Leonard

242. Writing of Profiles, Personality Sketches, Short Biography (4) Three hours of lecture/discussion and eight hours of fieldwork per week. Prerequisites: 200 or consent of instructor. Study of biographical writing from Plutarch forward, and writing profiles under varying conditions. (F) Taper

245. Social Aspects of the Mass Media. (3) Three hours of lecture/discussion per week. Critical evaluation of the mass media, discussion of problems of ethics and responsibility, and the production of several research papers. (SP) MacDougal

247. Inside Revolutionary China: Studies in Memoir, Fiction, and Day assignments per week. Students will analyze events, policies, and institutions in China over the last half century through the revealing reports provided in memoirs, fictional narratives, and feature articles. (F) Littlejohn will chronicle the personal experience of the revolution from the War of Resistance against Japan (1937-1945) through the post-Mao decade and the suppression of the 1989 democracy movement. (SP) Wakeman

248. Ethical Issues in Journalism. (3) Three hours of lecture/discussion per week. Study and research in the ethical problems of the working journalist, including conflicts of interest, questions of privacy, confidentiality of sources, withholding of news, relationships with the community and with authorities. (F,SP) Goldstein, Henry

249. Media and Society in China. (3) Three hours of lecture/discussion per week. This seminar examines the role of the media in China since 1949. Students will analyze the development and impact of the mass media (newspapers and magazines, radio, and television) and of the popular media (revolutionary operas, films, short stories, reportage, wall posters, cartoons, advertisements) from the period of the Communist victory and the Korean War to the Cultural Revolution to the democracy movements of 1979 and 1989 and the subsequent ideological retrenchment. (SP) Wakeman

250. Investigative Reporting. (4) Three hours of lecture/discussion plus eight hours of fieldwork per week. Prerequisites: 200 or consent of instructor. Study of investigative reporting, analysis of its techniques with outside reporting assignments. (F) Staff

251. Reporting as Literature. (3) Three hours of lecture/discussion per week. A study of outstanding examples of journalistic literature. (SP) Littlejohn

252. Magazine Article Writing. (4) Three hours lecture/discussion and eight hours of fieldwork per week. Prerequisites: For journalism students, 200 or equivalent; for others, consent of instructor. Study and analysis of the techniques of writing and editing of articles for publication (F,SP) Cohen, Taper

254. Opinion Writing. (2) Two hours of seminar per week. The reporting, writing, and editing of newspaper editorials and op-ed essays. Schrag

255. History, Ethics, and Law. (3) Three hours of lecture per week. Prerequisites: For journalism students, 200 or consent of instructor. This course will be required of all Master of Journalism candidates. It will complement the mandatory fall course, 200, a rigorous reporting and writing class requirement in journalism. The course will cover history, ethics, and law— to examine the evolving practices, responsibilities, and obligations of professional journalists. Students will submit a total of six short papers during the semester, two during each of the course’s three sections. (SP) Goldstein, Leonard, Turner

256. Technology and Journalism. (2) Two hours of lecture/discussion per week. Issues related to writing about high technology and high-tech industries. In addition to introducing students to industry consultants, technology writers, and technology companies, these tutorials will evolve using the Internet as a reporting tool. Markoff

268. Law for Legal Affairs Reporting. (4) Three hours of lecture/discussion per week plus additional outside time in the courts. Examination of the structure and philosophy of the legal system to prepare the journalist for reporting legal affairs. Hager

275. Radio News Reporting. (4) Four hours of lecture/discussion and laboratory/laboratory 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,SP) Drummond

281. Elements of Broadcast News. (1) Sixteen hours of lecture with laboratory assignments per week. Must be taken on a satisfactory/unsatisfactory basis. Fundamentals of broadcast news reporting and production for graduate students who do not intend to take a course sequence in television or radio. Required for those not taking 282. (F) Bieder

282. Introduction to Television News. (4) Four hours of lecture/discussion, fifteen hours of laboratory per week and some field work. Study of the history and institutions of broadcast journalism (nine weeks), production techniques of reporting news for radio and television. (F,SP) Bieder, Riggs, and Staff

283. Reporting for Television. (5) Six hours of lecture/discussion and twenty-four hours of laboratory/four work per week. Prerequisites: 200 and consent of instructor. Production of television documentary news programs. (F) Bieder, Riggs and Staff

285. Advanced Television Reporting: TV Magazine. (4) Three hours of lecture and fifteen hours of laboratory/four work per week. Prerequisites: 200 and consent of instructor. Production of television documentary news programs. (F) Markoff, Riggs

294. Professional Project (Thesis) Seminar. (1) One hour of seminar per week. Prerequisites: 200 and consent of instructor. Group meetings plus individual tutorials. Methods of research, organization, and writing of professional 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. Field study. Must be taken on a satisfactory/unsatisfactory basis. Supervised experience in the practice of journalism off-campus or organizations. Individual meeting with faculty sponsor and written reports required. See Additional Information, “Field Study and Internships.” (F,SP) Staff

298. Special Group Study in Journalism. (1-3) Course may be repeated for credit. For students who wish to pursue a special project of study and research not covered by any other course or seminar. Units of credit to be determined by the instructor. (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. (1-8) This course is designed for students who need to be re-searched when reporting on the politics, economics, and social issues of a foreign country. Course will include a one-week trip to Mexico and the production of a magazine. (SP) Chavez

B prefix=language course for business majors
C prefix=course satisfies R & C requirement
H prefix=honors course
AC suffix=course satisfies American cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
Landscape Architecture and Environmental Planning

(College of Environmental Design)

Department Office: 202 Wurster Hall, (510) 642-4022
http://www-laep.ced.berkeley.edu/laep/index.html
Chair: Walter Hood, Jr. M. Arch, M.L.A.

Professors

Peter C. Bosselman, M.Arch. Environmental education
Sally K. Fairfax, Ph.D. Institutional and legal aspects of natural resource administration
Randolph T. Hester, Jr., M.L.A. Community participation, neighborhood design
Linda L. Jewell, B. Arch., M.L.A. Relationship of design and construction technology
Joe R. McBride, Ph.D. Vegetation and ecological analysis
Michael Southworth, Ph.D., M.C.P., B. Arch. Urban design and planning
Garrett Eckbo (Emeritus), M.L.A. Landscape design, design theory
William Garnett (Emeritus), Landscape photography
Michael M. Laurie (Emeritus), M.L.A. History, urban parks, design
Luna S. Leonold (Emeritus), Ph.D. Hydrology
R. Burton Litton, Jr. (Emeritus), M.L.A. Visual analysis and aesthetics
Clare Cooper Marcus (Emeritus), Ph.D. Third World environments, resource conservation
Robert H. Twiss (Emeritus), Ph.D. Regional planning assessment, public land management
Francis Vrolch (Emeritus), B.S. City planning and design

Associate Professors

Timothy P. Duane, M.S., Ph.D. Energy and environmental planning
Walter J. Hood, Jr., M.Arch., M.L.A. Community design, landscape planning, design theory
G. Mathias Konold, Ph.D. Applied geomorphology and hydrology, environmental planning
Louise Mozcomo, M.A. History and design
John D. Padke, Ph.D. University of British Columbia.

Assistant Professors

Patricia A. Lindsey, M.L.A., Ph.D. Horticulture and plant design theory and practice

Adjunct Professors

David Meyer, B.S. Landscape Architecture
Peter E. Walker, M.L.A. Site planning and project design

The Profession

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 areas, schools, housing, neighborhoods, streets, and cities, planning for the preservation of open space and natural amenities, land management and development, and assessment of the impact of projects and proposals on environmental quality and design of such projects to be environmentally compatible.

Landscape design typically involves project planning, site planning of buildings and building complexes, and analysis, planning, and detailed design of public and private exterior spaces 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 simulation, recreation planning, and urban open space and transportation systems. The intent of all the emphases is the creation of delightful 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 completing a three-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, see the Announcement of the College of Environmental Design.

Graduate Program

The Master of Landscape Architecture Degree.

The Master of Landscape Architecture degree is a professional degree program accredited by the American Society of Landscape Architects. The program offers advanced work in landscape architecture from the scale of detailed forms to that of the regional landscape. A course of study 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 course work in landscape design, urban community design, and environmental planning.

Current faculty research and professional involvement include growth impact and land use planning, human behavior and environment, simulation, landscape visual and scenic assessment, ecological art, ecology and plant succession, hydrology and planning, cultural geography, the educative city, energy conservation in landscape and community design, urban forestry, and community participation in design and planning.

Concurrent Program in Urban Design or Environmental Planning.

The Departments of Landscape Architecture and Environmental Planning and City and Regional Planning jointly offer a program of studies in urban design or in environmental planning, leading to both the Master of Landscape Architecture and Master of City Planning degrees. Applicants for this program must have either completed 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 first or otherwise complete an appropriate master’s degree before applying.

For information about this program, please consult the Graduate Office, Department of Landscape Architecture and Environmental Planning, 202 Wurster Hall, or the Announcement of the College of Environmental Design.
102. Case Studies in Landscape Design. (5) Three hours of lecture and six hours of studio per week. Prerequisites: 101 or consent of instructor. This studio stresses the shaping and coordination of ideas from initial concept to complete design product. A product(s) of intermediate scale and complexity (such as a garden, small park, plaza, or campus courtyard) will be developed in detail including the selection of planting, selection of construction materials, and topographic design. At least three of the following five sections will highlight the connections between the human environment and other contexts. The course focuses on the interaction of environmental protection. Discussion of design process and planning methods, materials, and techniques of professional practice. (F) Mozingo

103. Cultural Factors in Urban Landscape Design. (5) Three hours of lecture and five hours of studio per week. Studio projects, lectures, research, field trips, weekly readings, and discussion will provide the framework for understanding cultural patterns and practices in the urban landscape. This cultural context will be examined as a source for design inspiration and expression. The primary focus of the studio will be on the interaction between humans, the city’s physical structure, and the natural environment. Particular urban landscape typologies will provide a framework for inquiry. These include wilderness, infrastructure, ravines, as well as formal decision-making for urban design and gardens. These types will be examined systematically, forging a context for broader interpretations and meaning. (F) Hood

104. Ecological Factors in Urban Landscape Design. (4) Two hours of lecture and six hours of studio per week. Prerequisites: 101 or consent of instructor. Through lectures, studio problems, research projects, and discussion, this course will explore the challenge and potential of incorporating ecological factors in urban design. Lectures focus on the interaction of landscape science (hydrology, geology, etc.) with the necessities and mechanisms of the human environment (urban design, transportation, economics, etc.). Lectures and research projects will particularly emphasize innovation and forward-thinking solutions to the ecological problems of the human environment. Throughout the semester, reading and discussion sessions will complement the focus of the studio on the broader concerns of the global ecological crisis and landscape design and planning. (F) Mozingo

110. Ecological Analysis. (3) Three hours of lecture and four hours of field laboratory per week. Analysis of ecological factors, ecosystem functions, and ecosystem services as related to decision-making for landscape planning and design. (F) McBride

111. Introduction to Landscape Plants in Design. (3) Three hours of lecture, and two reading assignments per week, plus weekly studio assignments. Weekly studio assignments are required. Introduction to lecture course. This course includes five sections: 1) use of plants in the landscape; 2) fundamentals of plant growth and development; 3) principles of landscape and environmental factors of plant design; 4) principles of design composition; and 5) planting design. (Final exam) Lindsey

112. Landscape Plants and Horticulture. (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: 111; Biology 1B or Environmental Science, Policy, and Management 6, or Integrative Biology 105, or consent of instructor. Field observation and analysis of plant species most suitable for use in Central California; horticultural techniques for landscape plantings including plant selection, soil, pruning, planting techniques, and pest management. Individual graphic exercises and reports. (SP) Lindsey

120. Topographic Form and Design Technology. (2) Two hours of lecture and one hour of field work per week. Prerequisites: 102 or consent of instructor. Technical, graphic and computational exercises, and studio problems in topographic site design and the shaping of the human environment. (SP) Jewell

121. Design in Detail: Landscape Structures, Materials, and Construction. (3) Three hours of lecture per week. Introduces the visual and technical qualities of landscape construction materials and structures including walls, paving, stairs, and trellis structures. (F) Jewell

130. Introduction to Landscape Architecture. (3) Three hours of lecture per week. Survey of landscape architecture as it has evolved as an expression of people, time and place, including the garden, parks, and public open space in urban and environmental settings. Discussion of design process and planning methods, materials, and techniques of professional practice. (F) Mozingo

131AC. Sacred Landscapes Across Cultures. (3) Two hours of lecture and two hours of fieldwork per week. Explorations of the nature of sacredness from personal to culturally defined places with a focus on Native American, Japanese, American Angola, and African American. Addresses authenticity, the nature of value systems, and environmental justice in the city and larger landscapes. This course satisfies the American cultures requirement. Offered every third year. (SP) Hester

132A. Computer Applications for Environmental Design. (2) Two hours of lecture and two hours of laboratory per week. This course has a practical introduction to some tools for spatial data manipulation in CAD. (F) Radke

132B. Computer Applications for Environmental Design. (2) Two hours of lecture and two hours of laboratory per week. It addresses special topics in the design and planning processes using CAD. The focus of the studio varies from semester to semester, but typical topics include garden design, park design, neighborhood design, open space design, and others. (SP) Radke

134. Advanced Graphics for Landscape Architecture. (4) Six hours of studio per week. Prerequisites: Environmental Design 11A or 11B or Landscape Architecture 230 or consent of instructor. Freehand and formal perspectives will investigate representational and design concepts. Pencil, ink, and color media. (SP) Sullivan

134A. Drawing Workshop 1. (2) Two hours of lecture and two hours of studio per week. Prerequisites: Environmental Design 11A-11B or consent of instructor. This studio will elaborate on a number of drawing techniques, and introduce students to the use of medium in the drawing of landscapes. Discussion of the development of design thinking. (F) Hood

134B. Drawing Workshop II. (2) Two hours of lecture and two hours of laboratory per week. Prerequisites: Environmental Design 11A-11B or consent of instructor. In this workshop students will further develop their drawing skills with emphasis on the interpretation of landscape science (hydrology, geology, etc.) with the necessities and mechanisms of the human environment (urban design, transportation, economics, etc.). Demonstration of color and presentation techniques will be investigated for communicating images and ideas. (SP) Sullivan

135. The Art of Landscape Drawing. (3) Two hours of lecture and two hours of field per week. This course develops freehand drawing as an integral part of the creative process and as an expressive design tool. A broad range of exercises is employed to help students develop garden, playground, and community design understanding and confidence in their drawing. Various media such as ink, colored pencils, and watercolor are explored as a method to design innovative landscapes. A variety of presentation techniques will be introduced for communicating landscape design. In addition to field sketching, there will be excursions to art galleries, artists’ studios, and other creative environments. Throughout the semester, reading and discussion sessions will complement the focus of the studio on the broader concerns of the global ecological crisis and landscape design and planning. (F) Mozingo

139. Computer-Aided Landscape Planning and Design. (4) Three hours of lecture and six hours of studio per week. Prerequisites: 134A-134B or consent of instructor. Through lectures, studio problems, research projects, and discussion, this course will explore the challenge and potential incorporating ecological factors in urban design. The course surveys the history of landscape architecture in the four realms: 1) gardens; 2) urban open space, that is, plazas, parks, and urban greenbelts; and 3) suburban design; and 4) regional and environmental planning. The course will review the cultural and social contexts which have shaped and informed landscape architecture practice and aesthetics, as well as the environmental concerns, horticultural practices, and technological innovations of historic landscapes. (F) Mozingo

C188X. Geographic Information Systems. (4) Two hours of lecture, one hour of discussion, and two hours of laboratory per week. Prerequisites: Some computer experience. Formerly C188X. This course introduces the student to the rapidly expanding field of Geographic Information Systems (GIS). 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 understanding of GIS, and its application to apply some of those concepts to contemporary geographical and planning issues. Also listed as Geography C188X.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a pass/neutral basis. Prerequisites: Consent of instructor. Enrollment restrictions apply. (F,SP) Staff

Graduate Courses

201. Ecological Factors in Urban Landscape Design. (4) Three hours of lecture and five hours of studio per week. Prerequisites: 201 or consent of instructor. Through lectures, studio problems, research projects, and discussion, this course will explore the challenge and potential incorporating ecological factors in urban design. Presentations and design projects will particularly emphasize innovative and forward-thinking solutions to the ecological problems of the human environment. Throughout the semester, reading and discussions sections will highlight exercises and studies that are related to the broader concerns of the global ecological crisis and landscape design and planning. (F) Mozingo

202. Design of Landscape Sites. (4) Two hours of lecture and six hours of studio per week. Prerequisites: 201 or consent of instructor. A site design studio that will develop the student’s ideas from initial concept to complete design of open space in various contexts. Typical projects will be of an intermediate scale and might include a park, plaza, museum sculpture gardens, playground, office park or housing project. Modules on social factors and planting design are included. (SP) Jewell/Hood

203. Reshaping the Urban Edge. (4) Two hours of lecture and six hours of studio per week. Prerequisites: 201 or consent of instructor. This studio seeks to focus on issues concerning new development sites that are socially, ecologically, and esthetically informed. Projects are at medium to large scale and include new residential areas, work places, and community and shopping centers. Addressed issues will particularly focus on regional open space preservation and design, cultural values in natural and built environments, identity and community in new developments, and relation to existing urban fabric. (F) Southworth

B prefix=language course for business majors
C prefix=course satisfies R& requirement
AC suffix=course satisfies American cultures requirement
* Professor of the Graduate School
† Recipient of Distinguished Teaching Award
204. Advanced Project Design. (4) Two hours of lecture and six hours of studio per week. Prerequisites: 201 or consent of instructor. Special topics in the design and planning of the landscape. The focus of the studio varies from semester to semester. Possible topics include community design, educative environments, landscape as art, park design, or energy conserving design. For current offerings, see department announcement. (F,SP) Staff

205. Environmental Planning Studio. (4) Six hours of studio and two hours of lecture per week. Prerequisites: 222 or 227, or Civil Engineering 113, or Environmental Science, Policy, and Management 151B, or consent of instructor. An introduction to environmental planning principles to a complex problem involving a variety of environmental criteria and desired land uses in a complex institutional and political setting. Students will need data, assess environmental developmental problems, weigh competing uses, and prepare an environmental management plan. (SP) Staff

210. Restoration of Aquatic Ecosystems. (2) Two hours of lecture/seminar per week. Prerequisites: 222 or 227, or Civil Engineering 210N, for students who intend to carry out research in aquatic ecosystems, supervise actual restorations or enhancement, and also students who are simply interested in this field. The course emphasizes differences and similarities between coastal and freshwater systems, and among wetlands, rivers, lakes, and estuaries, and coastal oceans. The course format is based on the Dahlem system where students prepare and present on topics of their interest. Critical reading of technical reports and improvement of writing skills. Offered alternate years. (SP) Kondolf

213. Landscape Planning Design. (2) Two hours of lecture and two hours of laboratory per week, plus two weekend field trips. Prerequisites: Geography 1 or Earth and Planetary Sciences 50, or equivalent. This course will introduce students to the theory and practice of landscape planning design. Application to specific sites will be addressed, with an emphasis on plant selection and an understanding of the multiple roles that plants may serve in a landscape setting. (SP) Lindsey

220. Environmental Geology for Planners. (4) Three hours of lecture and three hours of laboratory per week, plus two weekend field trips. Prerequisites: Geology 20 or equivalent. This course will provide an introduction to the geological principles followed by analysis of seismic hazards, landslides, flooding, coastal processes, soil erosion, and use of geologic information in planning. (F) Kondolf

221. Quantitative Methods in Environmental Planning. (3) One and one-half hours of lecture and three hours of laboratory per week. Discussion and critique of the application of quantitative methods to environmental assessment, analysis, and evaluation in environmental planning. Topics include geographical information systems, geostatistics, remote sensing, and multidisciplinary data 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 relevant hydrologic, hydraulic, and geomorphic processes, to provide the planner and ecologist with insight sufficient to coordinate with technical specialists in the field of hydrology. In addition, relevant regulation and policies are reviewed. (SP) Kondolf

223. Introduction to California Landscapes. (1) Three hours of laboratory per week plus two to three days of weekend 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 the major landscape regions in California. (SP) Staff

224. Vegetation Analysis and Management. (3) Two hours of lecture and four hours of laboratory per week. The analysis and assessment of vegetation for landscape design and environmental planning. Management of vegetation in parks, nature reserves, and open space areas. Offered alternate years. (SP) McBride

225. Urban Forest Planning and Management. (3) Three hours of lecture per week plus two one-day field trips. Must be taken on a satisfactory/unsatisfactory basis. 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) Four hours of studio per week. Prerequisites: 121 (may be taken concurrently). Landscape design project(s) investigated in terms of construction detailing and implementation on a specific site. (F) Jewell

227. Restoration of Rivers and Streams. (3) Three hours of seminar per week. Prerequisites: 220, 222, 201 (or comparable course work), Environmental Science, Policy, and Management 151A, or Geology 117 with instructor consent. This course reviews the underlying goals and assumptions of river and stream restoration projects, reviews techniques employed in these efforts, and emphasizes strategies for evaluation of projects and project success. The course focuses on geomorphology and hydrologic analyses relevant to restoration and enhancement of aquatic and riparian habitat in freshwater systems. Format: lectures by instructor, guest lecturer, and presentation of student projects. (SP) McBride

231. Landscape As a Sacred Place. (3) Two hours of lecture per week and two field trips (total of three days). Visual and cultural analysis of landscapes, in inventory, in inventory, and problems related to sustainable design development, with special emphasis on highly valued places. Offered every third year. (SP) Hester

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, in inventory, in inventory, and problems related to sustainable design development, with special emphasis on highly valued places. Offered every third year. (SP) Hester

233. Environmental Law and Resource Management. (3) Three hours of lecture/seminar per week. Prerequisites: Graduate standing. Formerly Interdepartmental Studies 233. An introduction to the American legal system governing the use and management of natural resources, and an overview of the major techniques that have been developed by courts, legislatures, and administrative agencies for environmental protection. Topics will include nuisance law, constitutional constraints on environmental protection, permit systems for development control, pollution control, natural resources planning law. Also listed as City and Regional Planning C253. (F)

234. Computer Applications in Landscape Architecture. (3) Three hours of lecture and three hours of laboratory per week. Intermediate introduction to the application of computers in landscape design; covers applications in computer mapping and graphics; landscape construction; planting design, and data base management; class problems using computer hardware and software in central campus and departmental computing facilities. (F) Radke

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; instruction in the use of computer hardware and video-taping, use of the environmental simulation in film-making, script writing, and presentation design. Exercises and projects. (SP) Bossellmann

236. Advanced Seminar in Land Use and Environmental Planning. (3) Course may be repeated for credit. Three hours of seminar per week. An advanced investigation of current problems in land use and environmental management, with a focus on the development of proposed policy responses and implementation strategies. Topics will vary from year to year. Likely topics include: the regulation of sensitive lands; environmental impact assessment; the regulation of design; supral-local land use controls; water resources law and policy; public lands, coastal zone management, and sad land resource extraction. Offered every third year. (SP) Staff

237. The Process of Environmental Planning. (3) Three hours of lecture/discussion per week. A review of the techniques used in environmental planning, and evaluation of alternate means of implementation in varying environmental and political settings. The class will examine and critique a number of well-known environmental planning programs and plans. Lectures and discussion will address recurrent planning problems, such as the limitations of available legal and political constraints on plans, conflicts among specialists. (F) Duane

239. Public Land and Resource Planning and Administration. (4) Three hours of lecture/discussion per week with seminars. Prerequisites: Environmental Science, Policy, and Management 151 or graduate standing. Covers history of federal lands policy and institutions, legislation, case law, and federal/state relations vis-a-vis planning for major public resources: wilderness, wildlife, recreation, minerals, forests, energy, etc. Analysis of U.S. Forest Service plans will be critical in integrating legal mandates, planning practice, and developments in resource management and planning. Formerly Interdepartmental Studies 239. (SP) Fairfax

240. Social, Cultural, and Psychological Factors in Design. (3) Three hours of lecture per week. Prerequisites: Environmental Design. A survey course to introduce designers to the basic approaches, concepts, and research findings in the field of people/environment relations. Lectures will focus on the application of relevant theories to the design problems of environments from a user’s perspective. Guest lectures will introduce students to a range of faculty and design practitioners who deal with sociocultural issues as they pertain to the design, perception, and use of the physical environment. (F) Staff

C241. Research Methods in Environmental Design. (4) Three hours of lecture/seminar and two hours of laboratory per week. Formerly Interdepartmental Studies 241. The components, structure, and meaning of the urban environment, environmental parameters, 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) Bossellmann

C242. Citizen Involvement in the City Planning Process. (3) Students will not receive credit for C242 after taking City and Regional Planning 208, Interdepartmental Studies 206 Fall 1991, 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 City and Regional Planning C281.

251. History and Theories of Environmental Planning. (3) Three hours of lecture per week. Prerequisites: Graduate standing. Investigation of the major ideas in environmental planning. Review of history and theory from the classical and contemporary literature. Topics include ecological determinism, rationalism, utilitarianism, public goods, economic externalities and market failure, social and economic values, ecological limits, ethics, aesthetics, preservation/conserver, and the role of the professional in environmental planning. Offered alternate years. (SP) Staff

252. Thesis and Professional Project Research Seminar. (2) Two hours of lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Approaches to research methods, including the case study, the survey, the experiment, and the his-
torical or theoretical study. The course will include a number of brief writing exercises directed toward the development of a thesis or professional project proposal. (SP) Southworth

253. Landscape Architecture and Environmental Planning Colloquium, (1) Course may be repeated for credit. Two to three 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 pre-prepared lectures faculty two or three per semester by department faculty, two or three by graduating students, the remainder by outside speakers. (F.SP) Staff

254. Topics in Environmental Planning, (2) Course may be repeated for credit. Two hours of seminar and one-half hour of consultation per week. Research seminar topics selected on topics in environmental planning. Seminars will include some guest lecturers, presentations by instructors, and presentations by students. Readings and research vary year-to-year depending on topic and staff. (F) 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 taken in conjunction with dissertation research, discussions with faculty researchers and environmental planning practitioners, and examination of topical issues in environmental planning. Topics will be announced at the beginning of each semester. (F.SP) Staff

270. The Urban Park, (2) Two hours of seminar/discussion per week. Review of the origins and development of the public park as a component of cities. Participation will be open to contemporary issues of conservation, changing uses and expectations, and future directions. Offered in odd-numbered years. (SP) Staff

271. The Literature of the Landscape Architecture Profession, (2) Two hours of seminar per week. Investigative ideas in landscape architecture through the study of Landscape Architecture, the discipline’s primary American professional magazine. Beginning with Volume 1911, it will be given to contemporary topical issues of the magazine in each given period. The content of the magazine articles will be related to other design and planning publications of the same period. The intent is to trace and understand the evolving focus of the landscape architecture profession and how it has responded to broader cultural movements. Topics may include aesthetics, ecological determinism, artistic movements, social values, preservation/conservation issues and the role of the professional in public life. (J) Jewell

291A. Government Resources of the Pacific Rim. (3) Three hours of seminar per week. The purpose of this seminar is to explore the development of government management of natural resources in the Pacific Rim. It has three goals. First, to address U.S.-western U.S. exceptionalism by understanding the global context of policies and programs that developed in the 19th-century United States. Second, to position current management regimes, issues, and assumptions in the context of globalization and emerging global institutions. Third, to explore and develop comparative theories of government resource ownership. Course material will focus on the development and role of law in defining access and rights in resources, the colonial experience, and the treatment of indigenous people, especially in connection with land, timber, and mineral resources. Although some background material will be treated in lecture, this is not a lecture course. Students will be expected to develop and contribute material on issues relevant to their own area of interest in the Pacific Rim. (SP) Fairfax, Peluso

295. 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 toward the M.L.A. degree. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and appointment as a research assistant. Supervised experience on a research project in landscape architecture and/or environmental planning. Regular meetings with faculty sponsor required. See departmental sheet for other limitations. (F.SP) Staff

296. Directed Dissertation Research, (1-8) 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 only to students who have been approved for candidacy for the Ph.D. degree and are directly engaged upon the doctoral dissertation. (F.SP) Staff

297. Supervised Field Study, (2-3) Any combination 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 experience relative to a variety of student research activities in landscape 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.SP) Staff

298. Group Study, (1-4) Course may be repeated for credit. Hours to be arranged. Topics to be announced at the beginning of each semester. (F.SP) Staff

299. Individual Research, (1-6) Course may be repeated for credit. Hours to be arranged. Prerequisites: Graduate standing and consent of instructor. Research work conducted preparatory to completion of the thesis or professional project as well as other approved research. A maximum of six units will be counted. 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 faculty sponsor. See departmental sheet for other limitations. (F.SP) Staff

300. Supervised Teaching in Landscape Architecture 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 faculty sponsor. See departmental sheet for other limitations. (F.SP) Staff

601. Individual Study for Master’s Students, (1-8) 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: Last semester of residence in M.L.A. program. Individual study is appropriate for students preparing for graduate and professional 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. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for doctor’s degree. 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

Program in Latin American Studies

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 desiring a balanced education focused on the Latin American cultural regions; students planning to enter business, government, or international agency service; students preparing to teach social science or language; or students preparing for graduate and professional schools.

From a rich variety of offerings within and across departments, there is a wide range of possibilities to suit the interests of students while completing an appropriately designed course of study. Students are aided in combining courses in a systematic way by an interdepartmental committee of faculty members. Spanish and Portuguese are required for the major. Students must gain an intermediate level of proficiency in one language and an elementary knowledge of the other. In addition, students pursue a multidisciplinary course of study that includes the history and literature of the region. Upper division electives are chosen according to students’ desire to focus on either the social sciences or the humanities. In the procedural aspects of organizing an undergraduate plan of study, students in the program are aided by participating members from different departments and programs, the faculty coordinator of the group major, student affairs officers in the International and Area Studies Teaching Program Office, and teaching associates working in the program.

The Major

Declaring a major in Latin American studies follows guidelines established by the College of Letters and Science. Students wishing to declare Latin American studies:

(1) must have completed two of the required lower division courses or their equivalents;
(2) must have completed at least two semesters of the primary language requirement or the equivalent;
(3) should declare the major no later than the semester in which they complete the first 61st unit (junior transfer students should contact the Teaching Program Office concerning their eligibility).

Students are reminded that: 1) no course work for the major can be taken on a passed/not passed basis

Latin American Studies

Group Major Office: International and Area Studies, 101 Stephens Hall, (510) 642-4466

Faculty Advisers
Jose Canella-Cacho (Public Policy)
Maria José Chavez (Journalism)
Margaret Chowling (History)
Ruth Benso Collier (Political Science)
Aline de Jarnac-Boitel (Agricultural and Resource Economics)
Laura Enriquez (Sociology)
Peter Evans (Sociology)
Sylvia Guendelman (Public Health)
Paulo Henrique Guedes (Journalism)
Michel Laguerre (African American Studies)
Beatriz Marín (Chicano Studies/Geography)
Francisco Maselli (Spanish and Portuguese/Comparative Literature)
Luiza Moreira (Spanish and Portuguese)
Richard Norgaard (Energy and Resources)
Julio Ramos (Spanish and Portuguese)
Alex Saragoza (Ethnic Studies)
Nancy Schepfer-Hughes (Anthropology)
Harley Shaken (Education)
Candice Slater (Spanish and Portuguese)
basis, and 2) no course may be used to satisfy more than one major requirement.

Minor. Latin American Studies does not offer a minor program. However, other minor programs taken in conjunction with Latin American Studies are encouraged.

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 two courses outside the College of Letters and Science may be used to fulfill group major requirements.

Study Abroad. The use of course work taken at institutions outside the United States to fulfill major requirements is restricted to the equivalent of three semester-length upper division courses. However, courses taken to fulfill the foreign language requirement for the group major are not included in this restriction.

Transfer Courses. A maximum of four courses taken at institutions (including those of the Education Abroad Program of the University of California) may be transferred into the major. These courses will be accepted only as four of the ten required upper division courses (regardless of unit value) and must be validated by the Office of Undergraduate Admission and Relations with Schools and approved by a major adviser. Courses used to fulfill lower division prerequisites are not included in this restriction.

Honors Program. To be admitted to the major honors program, a student must have senior standing with a grade-point average (GPA) of 3.3 or higher for all work completed in the University and a 3.3 or higher for all work completed in the major. In order to graduate with honors in the major, a student must enroll in the honors seminar, Latin American Studies H195. The thesis will be prepared under the supervision of a member of the Latin American Studies faculty committee and approved by a selected group of the same committee. Latin American Studies H195 may be included as one of the student’s elective courses. For information about eligibility for participating in the honors course, check with the Teaching Program Office.

Course Plan

The considerable flexibility within the Latin American studies major encourages students to construct a program appropriate to their specific intellectual, geographical, and career interests. The overarching structure of the major, however, presumes that each student has a three-tiered program. First, a series of lower division courses, in which LAS 10, Introduction to Latin American Studies, is crucial. Language proficiency in either Spanish or Portuguese equivalent to four college-level semesters is also required. Second, a series of upper division courses, which 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 and follow one of two tracks, humanities or social sciences. In addition, students may enroll in the Honors Program, which consists of a senior thesis seminar.

Lower Division

There are three required lower division courses. Latin American Studies 10 is critical since it provides the essential background for upper division work. The remaining requirements may be satisfied by (1) successfully completing the appropriate course or its equivalent, (2) providing evidence of AP credit, or (3) satisfactorily completing an upper division equivalent (only with prior consent from a faculty adviser). Several upper division options are listed below. Please consult the Teaching Program Office for current information.

Required Courses

Latin American Studies 10, History 8B. One of the following social science courses, the choice based on the focus the student intends to pursue at the upper division level: Anthropology 3; Economics 1, Political Science 2, or Geography 4. With prior written consent from a faculty adviser, a student may make the following substitutions: Anthropology 17, 73, or 144 for Anthropology 3; Environmental Economics and Policy 1 for Economics 1; Political Science 139B or 139C for Political Science 2.

Foreign Language Requirement

Students must attain an intermediate level of competence in a primary language (either Spanish or Portuguese) equivalent to four college-level semesters of instruction and an elementary level of competence in a secondary language equivalent to two college-level semesters of instruction. Two semesters of the primary language must be completed before admission to the major. The remaining two semesters may be completed at any time before graduation. Course work 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 course work with a grade of “C” or better. Primary language proficiency in either Spanish or Portuguese may serve as primary language equivalent to

Upper Division

No less than 30 units in upper division courses are required, including two Latin American literature/culture courses, two Latin American history courses, and six elective courses.

I. Latin American Literature and Culture (two courses): Students are required to complete one of the following sequences or the equivalent: Spanish 1, 2, 3, 4 or Portuguese 11, 12.

II. Latin American History (two courses): Students are required to complete one of the following sequences or the equivalent: Anthropology 17, 73, or 144 for Anthropology 3; Environmental Economics and Policy 1 for Economics 1; Political Science 139B or 139C for Political Science 2.

II. Two courses selected from the following: History 140A, 140B, 141B, 143, 145, Latin American Studies 150.

Upper Division Elective Courses

Completion of the following upper division requirements differs depending upon whether a student focuses on humanities or social sciences. Before electing courses to fulfill the upper division requirements, a student must indicate whether a social science or humanities perspective will be emphasized. The student focusing on humanities must fulfill a requirement 1 in either the social sciences or the humanities (one course) and the concentration requirement (five courses). At least one of the concentration courses must come from the social sciences. A student pursuing a social science focus must take one methods course, two theory courses (preferably from the same discipline), and three courses in one area of concentration. Concentration is defined as either a geographical area or a theme of study regardless of discipline.

A. Humanities Program. The Humanities program is designed for students who wish to focus their studies on the languages, literature, and culture of Latin America. As in the Social Science program, theory courses may be taken from a variety of fields and do not necessarily have to focus on Latin America. However, content courses (which also may have theoretical elements) must focus on Latin America. Students are required to complete:

(1) one theory course in social sciences or humanities, and

(2) five courses in the upper division concentration.

B. Social Science Program. The Social Science program is designed for students who wish to focus their studies on the social sciences. A student pursuing a social science focus must take two theory courses (preferably from the same discipline), and three courses in one area of concentration. Concentration is defined as either a geographical area or a theme of study regardless of discipline.

graduate Program

Master’s Degree. The M.A. program in Latin American Studies is a two-year program that provides an opportunity for interdisciplinary work on Latin America at the immediate postbaccalaureate level. Candidates must have a bachelor’s degree, a reading knowledge of either Spanish or Portuguese, and a high grade-point average. Applicants must take the Graduate Record Exam (GRE) and foreign 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 course work and writes a master’s thesis. Under Plan II, the stu-
dent completes 24 units of course work and takes a comprehensive 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 career. The program must include at least two courses or 8 units (three courses or 12 units for Plan II) 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 in their first year. Remaining courses/units may be at either the undergraduate (upper division) or graduate level, must include at least one methodology course appropriate to the student’s course of study, and should be selected in consultation with the student’s adviser. While a student’s program will consist primarily of courses focused explicitly on Latin America, courses with a comparative, theoretical, or methodological focus that contribute to the student’s work on Latin America may be considered.

The language requirement for both plans is a high level of proficiency in Spanish or Portuguese and a basic reading and speaking knowledge of the other language.

Doctoral Degree. The Ph.D. program in Latin American Studies is intended for advanced students who have completed an M.A. (or equivalent) in Latin America or in a related subject. Students should have unusually strong academic records and a high degree of intellectual maturity and independence. Students in this program will develop disciplinary interests that do not fit within the confines of traditional departments. Generally these students do not plan to pursue traditional academic careers. Admission to the program follows the same procedures as are required for the M.A.

Requirements for the Ph.D. Degree. Students must fulfill the GRE/TOEFL requirement, the minimum course and unit requirements described for the M.A. in Latin American studies, and the language requirements; pass the qualifying examination and write a dissertation. In addition, the residency requirement, a minimum of four semesters with at least 4 units at the 200 level each semester, must be met. The language requirement is a high level of proficiency in reading, writing, and speaking Spanish or Portuguese, a strong reading and speaking knowledge of the other of the two languages, and a reading knowledge of a third language chosen in consultation with an adviser. Students must complete their course work, a maximum of three courses in each discipline. Course work should be selected in consultation with a faculty adviser. Upon successfully completing the qualifying examination, students will be advanced to candidacy and will prepare a doctoral dissertation under the guidance of a three-member faculty committee.

Concurrent M.A. Degree. The Group in Latin American Studies, in cooperation with the Graduate School of Journalism, offers a concurrent M.J./M.A. in journalism and Latin American Studies. The program is designed to provide an interdisciplinary core course for students planning to pursue the Latin American Studies major, as well as other interdisciplinary core courses. The program will serve as a vehicle to take advantage of short-term visitors coming to campus who have considerable expertise in areas of interest to Latin American Studies. (F,SP)

150. Advanced Studies in Latin American Studies. (4) Course may be repeated for credit. Three hours of lecture per week for eight weeks. 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)

140. Special Topics. (2) Course may be repeated for credit. Three hours of lecture per week for 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)

130. Cross-Listed Topics. (1-4) Course may be repeated for credit. Three hours of lecture per week for 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)

266. Directed Dissertation Research. (1-12) Course may be repeated for credit. Unit credit to be based on workload ratio of three hours per week for each unit of credit assigned. Must be taken on a satisfactory/unsatisfactory basis. 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. Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor; graduate-level standing. Topics vary from semester to semester. (F,SP)

Graduate Courses

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. Topics may be repeated for credit with consent of instructor. (F,SP)

239. Cross-Listed Topics. (1-4) Course may be repeated for credit. Variable. Prerequisites: 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 semester to semester. (F,SP)

240. Special Topics. (2) Course may be repeated for credit. Three hours of lecture per week for eight weeks. Prerequisites: Consent of instructor and graduate-level standing. A graduate level 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 Latin American Studies graduate students. (F,SP)

250. Selected Topics in Latin American Studies. (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 geographic 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 courses. This course will involve directed readings and writing of a report. (F,SP)

269. Thesis. (1-12) Course may be repeated for credit. Credit toward the dissertation. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. (F,SP)

299. Individual Study. (1-4) Course may be repeated for credit. Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor and graduate-level standing. Topics vary from semester to semester. (F,SP)

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Independent. 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. Must not be used for unit of residence requirements for the doctoral degree. (F,SP)

Law (School of Law, Boalt Hall)
Office: 215 Boalt Hall, (510) 642-1741 http://www.law.berkeley.edu
Dean: John P. Dwyer, Ph.D., J.D.
Associate Deans: Jan Vetter, LL.B.
David Lieberman, Ph.D.
Assistant Deans: Victoria Oritz, J.D.
David Baskin, Ph.D.
Vice Chair, Jurisprudence and Social Policy: Charles J. McClain, Jr., Ph.D., J.D.
Professors

Alan J. Auerbach, Ph.D. Robert D. Burch Professor and Director, Robert D. Burch Center for Tax Policy and Public Finance (School of Law, Boalt Hall)
Thomas G. Barnes, D.Phil. English legal history (School of Law, Boalt Hall)
Richard M. Buxbaum, LL.B., LL.M. English legal history (School of Law, Boalt Hall)
€ Robert C. Berring, Jr., J.D., M.L.S. (Law Librarian and Walter Ferry Johnson Professor) Chinese Law, legal research and writing, legal profession, contracts (Law School, Boalt Hall)
€ Stephen M. Bundy, J.D. Alternative dispute resolution, legal ethics, civil procedure
€ Meir Dan-Cohen, LL.B., LL.M. (John H. Ralston Professor) Corporate law, international trade law, international transactions
€ Aaron S. Edlin, J.D., Ph.D. Law and economics, antitrust, enforcement (John H. Boalt Professor) Regulatory, torts, trademarks
€ Jesse H. Chapman, LL.B., J.D. (Earl Warren Professor) Contracts, law and anthropology, regulated industries (School of Law, Boalt Hall)
€ Stephen P. Choi, A.M., J.D., Ph.D. Corporate law, securities regulation, business taxation
€ Lauren B. Edelman, M.A., J.D., Ph.D. Sociology of law, law and employment, organization theory
€ Aaron S. Edlin, J.D., Ph.D. Law and economics, antitrust, industrial organization
€ Malcolm M. Feeley, M.A., Ph.D. Law and social science

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

Law / 297
Programs

The School of Law (Boalt Hall) has a three-year curriculum leading to the Juris Doctor (J.D.) degree. Educators at Boalt are faced with the varied needs of teaching students not only to understand legal doctrine but the forces that shape it, of providing experience in the basic working skills of the lawyer who must be able to grow and function for a half century in an ever-changing legal system, and of preparing students for the inevitable policy-making roles lawyers are called upon to fill in a complex world. To this end, Boalt’s curriculum is constantly undergoing reexamination and evolution. It currently includes specialized curricular programs in Environmental Law, Comparative Legal Studies, International Legal Studies, Law and Technology, and Public Policy/Public Interest. A large number of concurrent degree programs are available with other Berkeley campus graduate departments and with the Kennedy School of Government at Harvard University and The Fletcher School of Law and Diplomacy at Tufts University. Other combined degree programs are arranged on an individual basis. The school is a member of the Association of American Law Schools and is approved by the American Bar Association. Its graduates are qualified to become applicants for admission to practice in any state of the United States.

No single pre-law major is required or even recommended. However, these suggestions are made: students should learn to write by taking courses in which their work is vigorously edited; enroll in courses that demand analytical skills; obtain some breadth in humanities and social sciences that will help in understanding the social context within which legal problems arise; and acquire a general understanding of economic principles and the business world. However, prospective students should not be deterred from pursuing the study of law merely because their undergraduate education has not emphasized these areas. Diversity of background and experience enriches the legal experiences of all students.

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 (Jurs Scientiae Doctor, J.S.D.). The school does not offer a part-time or an evening program. It is offering an entering class once a year for the fall semester.

For further information, see the Boalt Hall Catalog and the Graduate Degree Program (LL.M.J.D.) application, both available from the Boalt Hall Admissions Office, 5 Boalt Hall.

Graduate Program in Jurisprudence and Social Policy. The School of Law offers a graduate program in Jurisprudence and Social Policy, leading to M.A. and Ph.D. degrees.

The program is unique in legal education. It is founded on two related convictions: (1) legal scholarship should have intimate connections with the social sciences; and (2) education in a law school should become as is confided to the professional training of future lawyers.

The program is multidisciplinary, involving faculty from law and a variety of humanities and social science disciplines, including economics, criminology, history, philosophy, political science, and sociology. It is designed for students who are interested in careers in teaching, research, policy analysis, or public administration.

Study for a degree in Jurisprudence and Social Policy may be combined with study for a J.D. degree. Further information on admission procedures and program requirements may be obtained from the graduate assistant, JSP Program.

Course Descriptions

This list is representative of courses offered in recent years. There is no implied guarantee that any particular course will be offered in the future. Course descriptions for the current semester are available on the web at www.law.berkeley.edu/courses.

First-Year Courses

Civil Procedure. The principles of pleading under the code system and the federal rules; modern trial practice, including venue, process, the jury, sufficiency of evidence, instructions, new trials, judgments, appellate procedure.

Constitutional Law I. Introduction to the subject covering judicial review and jurisdiction, federalism, separation of powers, and economic rights.

Contracts. The law of contracts; formation, performance, remedies and termination.

Criminal Law. An introduction to criminal law with primary emphasis on the general principles of criminal liability.

Legal Research, Writing, and Advocacy. Instruction in legal research and writing in the fall semester, and Gordon Johnson Moot Court Program in the spring.

Property. An introduction to the law of real property, including the topics of adverse possession, possessory estates in land, future interests, marital property, land use, alienation of property, and tenure, land-use planning, and local government.

Torts. The law of civil injuries, including both intended and unintended interference with personal and property interests as well as liability without fault.

First-Year Elective

In the past, first-year students have taken one elective course in the spring semester. The elective program is currently under review. Elective courses have included Civil Procedure II, Comparative Law, Courts and Social Policy, Gender and the Law, International Law, International Taxation, and Policy.

Second- and Third-Year Courses

The courses listed below are usually offered at Boalt Hall. However, changes in course offerings are sometimes necessary, and other changes are made periodically as a result of curriculum reviews. For current course offerings, please see the Boalt Hall web site at www.law.berkeley.edu. Descriptions of clinics and student-initiated courses and projects follow the second- and third-year courses.

Administrative Law. This basic course concentrates on the fundamental legal principles concerning federal administrative agencies, including legislative, executive and judicial control of administrative actions.
ministrative action, the exercise of administrative power, and structures of agency decision making.

Admiralty Law. Selected topics in maritime law, including jurisdiction, practice, maritime liens, charters and carriage of goods, maritime injuries, marine casualties, salvage, average, and limitation of liability are examined in this course.

Advanced Comparative Law Seminar. This seminar is designed to acquaint the student with the basic institutions and policies in legal systems adhering to continental European legal traditions, so-called civil law countries, with emphasis on judicial organization, the scope of judicial power, and the protection of civil and human rights.

Advanced Criminal Law. This course consists of workshops, lectures and interviews in the more sophisticated areas of cross examination, voir dire, motions and trial techniques; ethics, attorneys fees, defense issues, forensic, complex cases and topical subjects are also covered.

Advanced Criminal Procedure: Prosecution Perspectives. This course focuses on the legally challenging constitutionally mandated requirements of the criminal justice system by studying current high profile cases.

Advanced Environmental Law Workshop. This workshop is an advanced course for students seriously interested in environmental law and policy. It is a required course for the Environmental Law Certificate and is designed to engage students in current issues of legal analysis and public policy. Its subject matter changes from year to year.

Advanced Issues in Employment Discrimination. This seminar explores various advanced theoretical and policy issues in employment discrimination law.

Advanced Legal Research. An overview of the research universe that will make the transition from law school to law practice easier and more productive. Students will study a range of business law and policy related to current legal issues. They will examine the structure and use of the various research tools, working with all types of research books and systems, from the earliest nominative reporters to the newest online databases.

Advanced Topics in Jurisprudence. Platon’s Phaedrus is the topic of this course.

Alternative Dispute Resolution Process and Policy. This seminar introduces alternative dispute resolution (ADR) procedures, looks at how best to counsel clients in choosing the appropriate dispute resolution method, and evaluates the policy questions posed by various ADR methods.

American Federalism Seminar. This course explores historical and jurisprudential perspectives on American federalism, with attention to “the original understanding” of 1787, 19-century constitutional issues in light of governmental practice and law in the individual states, the modern phases of intergovernmental relations, and the radical, conservative, and technocratic critiques of contemporary federalism.

American Foreign Relations Law. This course examines the constitutional allocation and exercise of the foreign relations power and focuses on the roles of the executive branch, the legislature, and the courts in foreign affairs. Topics include the separation of powers; the constitutional and ethics of the war power both as a matter of the original understanding of the Constitution and as a matter of tradition and practice; recent conflicts; the roles of the branches in the making of international law; and the role of the federal courts in foreign affairs, especially their activities in the incorporation of international law with federal common law.

Analytical Methods for Business, Law and Policy. The course provides the analytical background necessary for the study of business law and policy related subjects, including antitrust, corporations, intellectual property, tax, international trade and the environment. Students gain a systematic understanding of the law, policies, and principles, including efficient resource use, competitive and non-competitive markets, and causes of market failure, such as externalities and monopoly. Finance and statistics are also covered.

Antitrust and Intellectual Property. This advanced course focuses on the special, and often complex, legal issues that are present at the intersection of antitrust and intellectual property. The course considers several issues, including the important role that innovation and intellectual property play in a competitive economy, market imperfections, trademarks, and the protection of intellectual property and antitrust, and mergers and consent decree remedies that involve intellectual property.

Antitrust Law. This course covers the fundamentals of antitrust as well as underpinning legal and economic theory. Topics include constraints (monopoly, cartels, oligopoly and miscellaneous cooperative activities among competitors); vertical restraints of trade between suppliers and customers (including resale price maintenance, territorial and customer restrictions, exclusive dealing, and requirements contracts); and horizontal, vertical and conglomerate mergers.

Antitrust Law and Economics Seminar. The course provides an in-depth understanding of the economic principles that underlie antitrust law and policy. Topics covered include merger analysis (the Merger Guidelines, market and monopoly power, the analysis of unilateral effects and coordinated effects), intellectual property law (exclusive licenses, licences and contracts, and joint ventures) and high technology (network effects, innovation, tying and monopoly leveraging, predatory pricing, and potential competition). Principles and policies that are the subject of a number of significant recent cases.

Appellate Advocacy. The course is designed to improve written and oral advocacy skills at the appellate level. It focuses on working with a factual record and on the analysis and creative use of legal authorities.

Arbitration of Employee Statutory Protections. This course will cover the development of the law governing the arbitration of claims of violation of collective bargaining agreements and commercial agreements and examines the developing and uncertain state of the law with respect to agreements to arbitrate claims of violation of federal and state statutes protecting individual employee rights. It explores the history and scope of the exemption of contracts of employment from the Federal Arbitration Act, the presumption of arbitrability, and the uncertain questions as to the legality of requiring arbitration as a condition of employment and the extent to which the courts will review arbitrators’ decisions interpreting laws enacted to protect individual rights.

Art Law. This course covers many of the legal, public policy and ethical laws that represent painters, sculptors, art dealers, auction houses, museums, collectors and others who comprise the world of visual art. Topics covered include moral rights in visual art, copyright, resale royalties, the art market, copyright, public art and government funding of art.

Asian Americans and the Law. In this seminar, students explore how the Asian American identity is interrelated by and mediated through law and legal norms. What are the contours of the Asian American antecedents of our contemporary notions of “parental autonomy,” “parents patriae,” and “children’s rights” are examined in the context of disputes about access to education and medical treatment, child abuse and neglect, foster care and adoption.

Civil Procedure II. This course essentially covers two subjects: choice of forum and choice of law. What court or courts have the power to hear a particular dispute, and what options do the parties have in choosing between or among them? What law will be applied by the court hearing the dispute?

Commercial Transactions. This course examines the law governing the sale of goods and the law governing the use of personal property as collateral to secure loans and other credit transactions.

Community Law Practice at East Bay Community Law Center (EBCLC). This course includes training in the substantive areas of EBCLC practice and in the skills necessary for representing EBCLC clients. In addition, the course focuses on the lawyer-client relationship, traditional and client-empowering theories of lawyering for disadvantaged communities, and questions of how to allocate scarce legal resources in a community-based practice.

Comparative Constitutional Law Seminar. This seminar is for students wishing to write an extended paper on some aspect of constitutional law outside the United States.

Comparative Environmental Politics and Policy. This seminar explores environmental politics and policies that are the legal antecedents of our contemporary notions of environmental law and policy. It compares national responses to environmental issues, including an analysis of the principal theories governing classification of community property and separate property, the management and control of community property, liability for property, the costs of spousal, and division of property in dissolution of marriages by divorce or death as well as some treatment of the rights of non-married cohabitants.

Child Advocacy. This course component of the Child Advocacy Law course covers several advanced professional issues that arise in representing children in dependency and adoption proceedings.

Children and the Law. This seminar explores the legal and psychosocial principles that govern the creation, regulation and termination of the parent-child relationship. The historical roots and common law antecedents of our contemporary notions of “parental autonomy,” “parents patriae,” and “children’s rights” are examined in the context of disputes about access to education and medical treatment, child abuse and neglect, foster care and adoption.

Constitutional Law Seminar. This re-
and Latin America). Topics include the legal profession, the judicial system, civil procedure and contracts as well as the role of foreign law in the American legal system.

Comparative Legal History. An introduction to the development of Western legal systems and a foundation for more advanced courses in legal history and comparative law. Topics include concepts of law and legislation; legal pluralism (Roman law, canon law, customary law) and legal culture; and justice and procedure.

Complex Civil Litigation: Cutting-Edge Issues. This course provides students with a window into cutting-edge issues and exposure to practical challenges presented in dealing with these complex cases. The subjects covered include jury persuasion in complex civil cases and the use of jury consultants, class action issues, and the use and misuse of experts in complex civil litigation.

Conflict of Laws. This course examines the choice of law, jurisdiction, recognition of judgments, and extraterritorial application of law. Emphasis is placed on theoretical and practical problems of choice of law.

Constitutional and Civil Rights of Immigrants: Current Issues. This course examines urgent current issues related to immigrants’ constitutional and civil rights, including the constitutional framework governing the rights of non-citizens, the degree of protection afforded by federal civil rights laws, and the impact of the dramatic statutory changes enacted by Congress in 1996.

Constitutional Law II. This course is an in-depth analysis of fundamental theory in the areas of freedom of speech, equal protection and due process of law. There is an extensive required reading list and class sessions are rigorous.

Constitutional Law II A. This course on constitutional adjudication involves traditional interests under the Equal Protection and Due Process Clauses including discrimination, affirmative action, privacy, travel, voting, poverty and other substantive interests as well as Congressional power to enforce civil rights.

Constitutional Law III. This course covers freedom of the press, speech, association and religion, combining coverage of the major issues with in-depth analysis, thus enabling the class to deal with new problems as they arise.

Constitutional Law Seminar. This writing seminar involves an examination of selected current problems in constitutional law. The subjects covered may include issues presented by cases currently on the Supreme Court docket or decided by the Court in recent terms, or may be a more selective look at contemporary debate. Topics will be chosen in consultation with members of the seminar.

Contemporary Readings in Law and Society. In this seminar, students read and discuss recent law and society literature. The topics covered include the legal consciousness of marginalized groups such as women, ethnic minorities and the welfare poor; the legal profession; dispute resolution; law and gender; law and violence; law and the state; and law and social movements.

Copyright. This is an in-depth course in copyright, covering legal protection of works of literature, art, architecture, computer software, industrial design and other forms of authorship, mainly under the federal Copyright Act of 1976. Attention is also given to challenges to copyright posed by digital technologies and the Copyright Act of 1976. Attention is also given to challenges to copyright in the context of music, dance, art, architecture, computer software, industrial design and other forms of authorship, mainly under the federal Copyright Act of 1976.

Copyright and Trademarks. An in-depth study of the intellectual property rights law and its role in social and economic competition, both independently and as it interacts with copyright law. The course also takes a brief look at some other forms of intellectual property, such as the right of publicity and legal protection for ideas.

Copyright Theory Seminar. This seminar studies recent literature about the theoretical underpinnings of copyright law and inquires about the transformations in copyright concepts likely to occur as more copyright-related material is disseminated in global digital networks.

Corporate Finance and Bankruptcy Reorganization. This course has two main purposes: first, to introduce students to the major elements of corporate bankruptcy reorganization under Chapter 11 of the Bankruptcy Code; and second, to show students how bankruptcy (as well as other law) affects the structure of corporate financing transactions outside of bankruptcy.

Corporate Finance Seminar. This seminar studies the financial conditions and processes that affect corporate and securities transactions. Topics covered include valuation, the dividend decision, mergers and acquisitions, corporate restructuring, financial instruments used to manage risk, and international securities transactions.

Corporations I. This course is an introduction to basic legal principles governing the relations among investors, managers, creditors and workers in the business enterprise. The course focuses primarily on state corporate law and the federal corporate law, but some attention is given to partnership, securities and employment issues.

Corporations II. This class emphasizes the relationships among the participants in the corporate venture, with particular attention to the fiduciary principles governing those relationships in a detailed, transaction-specific context. The course also deals with litigation concerning the corporation, particularly but not exclusively with derivative suits.

Courts and the Image of Justice in Cinema. This course introduces students to the concept of justice and its cultural function, both as a value and as a legal institution, as expressed in the depiction of trials and judgments in films. The films cover various countries and historical periods and provide elements for a comparative study of judicial systems.

Courts and Social Policy. This course explores the role courts play in efforts to effect significant social change through litigation. It compares the role of courts in the American political process with their role elsewhere, and examines the distinctive importance of judicial review and the language of constitutional rights in American legal culture.

Crime and Social Control. This seminar examines major sociological works on crime and social control. It focuses on the ways that social and political structures and institutions, such as schools and the criminal justice system, influence the lives of adolescents and young people. The course also looks at various efforts to promote equality in schooling. These efforts began with desegregation to foster racial equity but have expanded to prohibit discrimination on the basis of sex, national origin, age, sexual orientation and disability. Some states have experimented with class-based remedies, such as school finance reform. The course evaluates the successes and short-comings of these initiatives as well as future strategies for addressing the perennial crisis in public education.

Criminal Procedure. This course focuses on basic issues of criminal procedure through case analysis, lecture and discussion of their implications for police officers and citizens. Topics include constitutional constraints on search and seizure, police interrogation, the right to counsel, discovery, sentencing and capital punishment.

Current U.S. Supreme Court Cases. This course considers in depth a series of constitutional law cases to be decided during the current term of the U.S. Supreme Court. Each student is assigned the role of one of the Justices of the Supreme Court and reads the basic constitutional views of that Justice for the purpose of advancing that Justice’s position on each of the cases, and writing one majority opinion of substantial magnitude and at least one concurrence or dissent.

Cyberlaw. The emergence of global digital networks and digital technologies has brought with it a host of new legal issues that lawyers preparing to practice in the 21st century need to understand and address. The course explores specific problems in applying law to cyberspace in areas such as intellectual property, privacy, content control and the bounds of jurisdiction.

Death Penalty Seminar. The course offers an overview of the law governing the death penalty and considers topics including challenges to the death penalty; attempts to enact constitutional death penalty statutes; penalty phase evidence, arguments and instructions; jury selection in capital cases; the role of trial judges and appellate courts in capital sentencing; the effect of race on the administration of the death penalty; and post-conviction review.

Disability Rights. This course teaches disability rights, an emerging area of civil rights law, exploring the substantive areas of employment, housing, education and access rights, as well as teaching practical skills for litigating these civil rights cases.

Domestic Violence Law Seminar. This course examines the legal system’s response to domestic violence using an interdisciplinary approach. The course covers legal and psychological materials as well as topics in criminal, family, tort, immigration, welfare and constitutional law.

Economic Analysis of Legal Rules II. This seminar uses economics to study law and legal institutions, emphasizing the economics of the common law and also covering the theory of institutions, regulation and federalism.

Education and the Law. This course examines how the government has come to dominate the delivery of educational services to promote economic preparedness and civic virtue. Instead of being left to local and central part in allocating opportunity, the course also looks at various efforts to promote equality in schooling. These efforts began with desegregation to foster racial equity but have expanded to prohibit discrimination on the basis of sex, national origin, age, sexual orientation and disability. Some states have experimented with class-based remedies, such as school finance reform. The course evaluates the successes and short-comings of these initiatives as well as future strategies for addressing the perennial crisis in public education.

Employment Discrimination Law. This general survey course explores various state and federal laws prohibiting employment discrimination based on race, sex, national origin, age, sexual orientation and disability.

English Legal History. This course is a topical introduction to English legal developments, both common law and equity, 1200–1700. Major emphasis is placed on history and legal and social issues encountered as practitioners shepherd a project from raw idea to final distributed product. Topics also include agents, managers, the studio system, new media, sexually oriented entertainment and careers in entertainment law.
Environment and Culture. The theme of this course is preservation as it applies to the natural world (parks, wilderness, wildlife), cultural properties (art, historic structures, objects of scientific importance), and communities, etc. The fundamental question is why preservation becomes an official policy of the state, and how many other important values are affected by preservation mandates.

Environmental Law and Policy. This course explores fundamental legal and policy issues in environmental law. By focusing on a limited number of statutes—principally the Clean Air Act, the hazardous waste statutes, and the National Environmental Policy Act—students study in detail the principal methods of regulation, as well as important environmental issues such as the role of citizens in enforcement, the value of provisions forcing agency action, the role of judicial review, and the optimal allocation of regulatory authority between the federal government and the states. Topics covered include the National Environmental Policy Act, the Clean Air Act, the Clean Water Act, the Toxics Hazard Prevention Act, the Comprehensive Environmental Response Compensation and Liability Act, and the Resource Conservation and Recovery Act.

Estate Planning and Taxation. This course is a basic study of the federal estate and gift taxes, and select associated features of the income tax, with some attention to elementary estate planning.

Estates and Trusts. This course provides an introduction to intestate succession, the drafting and enforcement of wills, limitations on the power to bequeath, trusts and other devices to create and control future interests. It emphasizes California law, though alternative rules are also considered.

European Law. This course presents an introduction to European law and legal institutions of the European Union and the decisions of the European Court of Justice.

Evidence. This course offers a study of the basic problems in evidence law through analysis of the Federal Rules of Evidence, case law and problems. Topics covered include relevance, trial process, competency and examination of witnesses, hearsay and other rules of exclusion, and lay and expert opinions. Discussion of allocating decision-making authority between judge, jury and adversaries, and between trial and appellate courts, occurs throughout.

Evidence Advocacy. This course presents the application of evidentiary rules and principles of trial practice through actual courtroom experience. Students work with a variety of hypotheticals and prepare and execute direct examination, cross-examination, opening statement and closing argument.

Exclusive Rights in the Biotechnology and Pharmaceutical Industries. Regulatory exclusivity and patent rights have become important factors in biopharmaceutical product development and marketing strategies. The nature of the remedies afforded by these market protections is examined as a catalyst to the effective acquisition of competitive advantage. The role of the patent in today's evolving legal and political system is considered.

Environmental Law Writing Seminar. Each student in this seminar produces a short research paper to be published in the Ecology Law Quarterly and takes part in the rich intellectual discourse in environmental policy on the Berkeley campus.

Environmental Litigation. The course content explores three universal stages of the litigation process: analyzing potential theories of liability and defenses, determining the appropriate targets for recovery, and selecting the desired remedy. Within each stage, the class examines the nature of liability, the allocation of risk and the means of resolving disputes as they affect the courts and the states, and the roles of federal and state law.

Federal Criminal Law. Students gain familiarity with federal statutes that give rise to the bulk of complex criminal prosecutions in the federal system, including mail and wire fraud, RICO and federal narcotics, and tax offenses. The Federal Sentencing Guidelines and sentencing litigation are also explored, and federal criminal law practice is examined from the defense as well as prosecutorial perspective.

Federal Indian Law. This course concerns the legal relationships among American Indian tribes, the United States, and the states. Topics covered include the history of American Indian law, the conflicting tribal, state and federal interests and innovations in the Indian lands; the concepts of tribal sovereignty and self-determination; and natural resources on Indian lands.

Federal Practice Clinic Seminar. This seminar is designed for students who are concurrently enrolled in the Federal Practice Clinic. The seminar provides a theoretical foundation for the students’ work and also affords an interactive forum for students to workshop their cases. Topics for the seminar include introduction to federal courts, federal civil and criminal discovery, habeas corpus and appellate practice.

Gender and the Law. This course explores the relationship between sexual orientation, gender, nonconformity and law. The course examines various legal principles that might be used to limit the ability of government and other institutions to disadvantage people because of their sexual orientation. There is a special emphasis on constitutional doctrines, including equal protection and due process/privacy.

Habeas Corpus. This course draws upon constitutional, civil law, criminal law, and political theory in analyzing the history and development of habeas corpus and its rationale. The course traces the history of the Great Writ and examines its origins and evolution and provides a thorough understanding of the rights of habeas petitioners in state prison (and probation) and federal prison, and the impact of recent legislation and Supreme Court decisions upon those rights. The course explores the impact of politics upon the role of habeas in the constitutional scheme and considers the relationship between habeas and legal developments in other areas of law, with a special focus on the influence of the death penalty. This course is of particular interest to students considering federal court clerkships.

Health Care Law. This course studies legal issues relating to medical practice, health insurance, and the rights and responsibilities of health care providers and patients, including doctor and hospital licensing, including the informed consent level of the informed consent obligation, and the relationship between third-party payments and the provision of health care, laws relating to death and dying, and selected biomedical ethical topics.

History of Punishment. This course considers the changing pattern of state-organized punishments in the U.S. and western Europe from the late-18th to the early-20th century. Attention is devoted to the emergence of the penitentiary as the standard sanction for the treatment of the most serious crimes; and to the later alternatives, including probation, and the correction and rehabilitative models of criminal corrections. The course explores such general issues as what a community’s penal practices reveal about its system of social values and cultural expectations; its conceptions of criminality and related understanding of normal social agency; and its delineation of the range of socially acceptable techniques of public coercion and force.

Human Dignity. The idiom of human dignity is increasingly current in legal writing and judicial opinions. But what exactly does dignity mean? The course examines this question in the light of different philosophical foundations of this concept, as well as by examining its legal implications.

Human Rights Writing Seminar. This course allows students to pursue a project of publishable quality for the writing requirement in the field of human rights.

Income Tax I. This course uses statutory, judicial and administrative materials to examine the rules and principles of federal income taxation, particularly as applicable to individuals. It provides a working understanding of the tax concepts and statutory provisions as well as an appreciation of the economic and social implications of the law and its potential use to implement defined policy objectives.

Income Tax II. This course covers the federal income taxation of organizations and business enterprises—corporations, partnerships, limited liability companies, etc. It places great emphasis on understanding the Internal Revenue Code and Regulations. Attention is given to policy, planning and theory.

Indian Law. This course provides an overview of federal Indian law through a study of cases and historical events to comprehend the basic jurisprudential and constitutional conflicts among sovereign governments which dominate this area of law including conflicts over land rights, hunting and fishing rights, water rights, domestic relations law and environmental protections.

Insurance Coverage for Intellectual Property, Antitrust and E-Commerce Exposure. This course focuses on comparative coverage available for risks typically arising in connection with intellectual property, antitrust and e-commerce exposure as well as new and specialty risks specifically designed to address these information-age claims. It highlights evaluation of appropriate coverage to respond to such risks and presents the best portfolio of coverage to minimize such exposures. This course also provides an opportunity to see a dynamic area of law developing where key legal issues have yet to be fully addressed by a number of courts throughout the United States.

Insurance Law. This course examines principles of insurance policy interpretation and the law of property insurance, liability insurance, and the insurance claim settlement and ERISA.

Intellectual Property Strategy for E-Commerce. The purpose of this course is to prepare entrepreneurs and future e-business managers to manage the legal issues that arise out of e-commerce so as to protect and expand the operations of the business, that is, in a strategic way. Intellectual property is at the core of the integration of market and non-market strategies of e-business enterprises, and IP rights and the legal system in general, constrain and enable many of the market strategies of e-commerce companies as well. The course will provide an introduction to the economics and law of intellectual property, and will apply it directly to established and emerging e-business strategies.

Intellectual Property Strategy. This course focuses on intellectual property strategy at the highly challenging level of the innovative company. Students are designed to provide students with a solid understanding of key strategy issues in the field of intellectual property law, and to help prepare students to take leadership roles in using such intellectual property as an asset. The goal is to give students a grounding in the strategic thinking necessary to guide a company’s overall approach to intellectual property issues.

Intellectual Property Transactions. This course covers the myriad transactions involving intellectual property rights in the modern economy. The law of ownership of rights; assignment of rights, especially in the employment context; licensing transactions; security interests in intellectual property and other finance-related property; and anti-trust considerations are covered.
International Agreements and Institutions. The post-Cold War world is facing a variety of complex and pressing global issues including human rights, ethnic conflict, environmental degradation, financial crises, arms control and disarming, and many others. The course considers some of these issues, focusing on their legal implications. The course is intended to provide an introduction to the international system and its institutions. Students will learn about the basic mechanisms for the international protection of human rights, emphasizing international treaty and non-treaty mechanisms for protecting and promoting human rights, including regional systems and the role of non-governmental organizations. The use of international law and international organizations will be addressed.

International Law. This course deals with the basic rules governing the international community. A substantial portion of the course focuses on the role of international and national tribunals in the law-making process of the international community, with emphasis placed on modern developments in the fields of jurisdiction, international agreements, the law of the sea, and international economic law. Special consideration is also given to the impact of the United Nations on the development of international law.

International Law and Ethics. This course examines issues of international law, politics and morality by attempting to develop a legal and ethical framework for the analysis of international affairs. It considers how different theories of justice ought to apply to international law and international politics, focusing on the relationship between international institutions and international ethics. The course also explores the question of whether international law is real law or whether other methods of analysis provide better explanations of international behavior. The course then examines how these different theories of justice and international affairs apply to specific examples of international politics.

International Tax Law. This course studies the law of international taxation and the taxation of foreign-source income and foreign persons income. Emphasis is placed on the underlying problems with which the law attempts to deal and on present or proposed solutions. Special attention is paid to the tax problems faced by U.S. citizens and residents investing or doing business in foreign countries, especially the U.S. taxation of income earned by U.S. taxpayers abroad.

International Trade. This course provides an introduction to American trade law and the world trade system. Topics include the U.S. Constitution and the statutory regulation of international economic affairs, unfair trade practices, American antidumping and countervailing duty laws, and the legal structure established by the World Trade Organization. The WTO dispute settlement process, tariffs, quotas, nontariff trade barriers, most favored nation status and national treatment clauses, and free trade areas are studied.

Internet and Software Issues in Patent Law. This course provides a practical understanding of the patent issues involved in the software fields. The course will use practical materials (such as pleading from actual lawsuits, patent license agreements and patent file histories) and will provide students an opportunity to engage in exercises that simulate real-world situations.

Interviewing, Counseling and Negotiation: A Lawyering Skills Course. This course gives students an orientation to, and some practice in, the basic skills required for both litigation (short of trial) and transactional law practice. It is intended to prepare students for working with clients and to teach them to use their legal training effectively in solving practical problems. The course is designed to help students develop effective interviewing and counseling skills.

International Finance. This course examines financial transactions that cross national borders. Because virtually all financial transactions take place through national laws, important questions exist regarding the appropriate country to regulate a particular transaction and the appropriate law to be applied. The course will cover, on a U.S. law basis, the international securities transactions and international banking activities.

International Human Rights Law Clinic Seminar. This seminar functions as the "companion course" for the International Human Rights Clinical Project. The course stresses skills development, review of relevant substantive refugee and human rights law, and discussion of and reflection about the student's clinical projects.

International Human Rights: Law, Policy and Process. This seminar introduces the law and institutional mechanisms for the international protection of human rights, emphasizing international treaty and non-treaty mechanisms for protecting and promoting human rights, including regional systems and the role of non-governmental organizations. The use of international law and international organizations will be addressed.

Introduction to Jurisprudence. This course provides an introduction to the main currents of contemporary thought about the nature of law. Among other things, the traditional problem of the source of law’s authority is considered, and the course asks whether law just is law or whether law does or ought to bear a relatively close relationship to morality. It considers the changing conception of law’s function ushered in by the legal realism movement, and questions the adequacy of legal positivism. The course also examines important issues in the design of international institutions, such as sanctions, incentives, dispute settlement, and information—considering these in theory and examining how they have been handled in various international regimes.

International Aspects of Intellectual Property Law. In the highly integrated global economy, goods and services move with limited regard for national borders, and the innovative component of goods and services increasingly defines their value. The protection of intellectual property rights (IPRs) on an international basis assumes great importance for investors, authors and artists, and business enterprises. This course examines the international system for the protection of IPRs.

International Business Transactions. Class sessions emulate the functioning of a law firm, and the subject matter covered includes transnational practice issues, advising on foreign law, registration requirements for foreign lobbyists, dispute resolution, transactions with governmental entities and sovereign immunity, regulation of unfair international trade practices, failure to afford intellectual property protection, international regimes for arbitration, antitrust issues, in addition to the usual treatment of Articles 2 and 4, bankruptcy, foreign investment and transitional tax planning for individuals.

International Civil Litigation. This course provides an introduction to the civil procedure issues that arise in American and international civil litigation. It discusses the American and international enforcement of judgments, and problems such as the separation of powers, federalism, and domestic issues in international civil litigation. The course also examines how factors such as the separation of powers, federalism, and laws alter (or not) the manner in which American and foreign courts handle initial civil procedure issues and the manner in which international disputes are resolved.

International Development Law and Policy: This course explores legal issues, institutions and strategies pertaining to international development, examining efforts to strengthen foreign legal systems through such devices as improved judicial administration, alternative dispute resolution and legal aid, and focusing on substantive legal issues pertaining to human rights, the status of women and children, and economic and social development. The seminar addresses many of the social science and legal literature on how that system actually works. Among the topics examined are the degree of litigiousness in Japan, informal systems for adjudicating disputes, the Japanese constitution, the role of judges in the Japanese judicial system, the Japanese bar, and law and practice in Japan. The course also focuses on international regimes and the role of non-governmental organizations in the international community.

International Human Rights Law Clinic Seminar. This seminar functions as the "companion course" for the International Human Rights Clinical Project. The course stresses skills development, review of relevant substantive refugee and human rights law, and discussion of and reflection about the student’s clinical projects.

International Human Rights: Law, Policy and Process. This seminar introduces the law and institutional mechanisms for the international protection of human rights, emphasizing international treaty and non-treaty mechanisms for protecting and promoting human rights, including regional systems and the role of non-governmental organizations. The use of international law and international organizations will be addressed.

International Law. This course deals with the basic rules governing the international community. A substantial portion of the course focuses on the role of international and national tribunals in the law-making process of the international community, with emphasis placed on modern developments in the fields of jurisdiction, international agreements, the law of the sea, and international economic law. Special consideration is also given to the impact of the United Nations on the development of international law.

International Law and Ethics. This course examines issues of international law, politics and morality by attempting to develop a legal and ethical framework for the analysis of international affairs. It considers how different theories of justice ought to apply to international law and international politics, focusing on the relationship between international institutions and international ethics. The course then examines how these different theories of justice and international affairs apply to specific examples of international politics.

International Tax Law. This course studies the law of international taxation and the taxation of foreign-source income and foreign persons income. Emphasis is placed on the underlying problems with which the law attempts to deal and on present or proposed solutions. Special attention is paid to the tax problems faced by U.S. citizens and residents investing or doing business in foreign countries, especially the U.S. taxation of income earned by U.S. taxpayers abroad.

International Trade. This course provides an introduction to American trade law and the world trade system. Topics include the U.S. Constitution and the statutory regulation of international economic affairs, unfair trade practices, American antidumping and countervailing duty laws, and the legal structure established by the World Trade Organization. The WTO dispute settlement process, tariffs, quotas, nontariff trade barriers, most favored nation status and national treatment clauses, and free trade areas are studied.

Internet and Software Issues in Patent Law. This course provides a practical understanding of the patent issues involved in the software fields. The course will use practical materials (such as pleading from actual lawsuits, patent license agreements and patent file histories) and will provide students an opportunity to engage in exercises that simulate real-world situations.

Interviewing, Counseling and Negotiation: A Lawyering Skills Course. This course gives students an orientation to, and some practice in, the basic skills required for both litigation (short of trial) and transactional law practice. It is intended to prepare students for working with clients and is taught using a combination of lectures, demonstration videotapes and simulation exercises. Students interview clients, learn about communication skills, counsel clients, and negotiate on their client’s behalf.

Introduction to Intellectual Property. This course is intended both for students who are interested in a general overview of intellectual property and as a gateway to Boalt’s Law & Technology program. The course begins with an analysis of the competing policies underpinning intellectual property law, including the basic principles of trade secrets, patent, copyright and trademark law. Two areas in intellectual property of particular contemporary interest are considered in depth—the protection of computer programs and biotechnology. The course includes discussions of licensing, ownership, and antitrust issues, in addition to the usual treatment of requirements for legal protection and infringement of rights.

Introduction to Jurisprudence. This course provides an introduction to the main currents of contemporary thought about the nature of law. Among other things, the traditional problem of the source of law’s authority is considered, and the course asks whether law just is law or whether law does or ought to bear a relatively close relationship to morality. It considers the changing conception of law’s function ushered in by the legal realism movement, and questions the adequacy of legal positivism. The course also examines important issues in the design of international institutions, such as sanctions, incentives, dispute settlement, and information—considering these in theory and examining how they have been handled in various international regimes.

Introduction to Law and Economics. Economic analysis provides one of the major theoretical perspectives for the study of law and policy. In this course, students learn how to construct and critique economic models of the incentive effects of different legal rules and institutions.

Introduction to Legal Theory. This class focuses primarily on theoretical and philosophical understandings of substantive legal issues. It identifies salient idea and values that shape legal discourse and inform legal policies both in a wide variety of areas such as crimes, contracts, property and torts, as well as in regard to such basic legal commitments as the rule of law and due process. The main strands of thought within the liberal tradition are used as a backdrop against which many legal controversies can be best understood.

Japanese Law and Society. This course introduces students to the legal system of Japan in terms of the role of the social science and legal literature on how that system actually works. Among the topics examined are the degree of litigiousness in Japan, informal systems for adjudicating disputes, the Japanese constitution, the role of judges in the Japanese judicial system, the Japanese bar, and law and practice in Japan. The course also focuses on international regimes and the role of non-governmental organizations in the international community.

Jurisprudence. This course views the law in philosophical perspective. Topics include the relation between law and morality, legal reasoning, the justification of sanctions and rights, authority, the ethics and political theory of adjudication and legislation; and positive law and nihilism.

Jurisprudence and Social Policy Orientation Seminar. This seminar is required for all first-year students in the Graduate Program in Jurisprudence and Social Policy. Through intensive reading and discussion this seminar establishes the scope of jurisprudence and social policy for degree candidates, provides them with a common core of theoretical and empirical materials, and acquaints them with options for specialization. Enrollment limited to students in the Jurisprudence and Social Policy program except with special permission from the instructors.

Jurisprudence and Social Policy Seminar in Law and Politics. A survey of recent literature by political scientists and others about law and courts.

Juvenile Justice. The juvenile court was initially hailed as a revolutionary use of law to single-mindedly further the welfare of children. After a century of practice, it is simultaneously revered and reviled. This course examines the major jurisdictional categories and the legal doctrines of the juvenile court and contrasts the treatment of young offenders in juvenile and criminal courts. The course covers law and politics for further reform of the juvenile court’s delinquency jurisdiction is a major focus.

Labor Law. This course considers the fundamental legal principles affecting labor relations in the private sector workplace. These principles are incorporated in the National Labor Relations Act and in related legislation. Several topics will be reviewed, including union organizing and election, collective bargaining, strikes, boycotts, arbitration and individual employee rights within unions.

Land Use Planning. This course examines traditional land use controls, such as zoning and private covenants; programs arising from the environmental decade of the 1970s, such as comprehensive plan-
Other areas and also compares "rational actor" and concepts of intent, responsibility, deterrence, retribution in the debate in the U.S. over the ratification of the federal constitutional structures and political liberty. The law of very different societies be compared? The law of moral and social systems of modern South Asia. Has also been the subject of great narrative works of art. This course examines these artistic precedents.

Law and the Making of Modern South Asia. Law has been one of the most influential tools in building the social and political systems of modern South Asia. Starting with a comparative study of community law (religious and secular), this course then examines the clash that occurred between different ideas of law beginning with colonial period. The course is not only about how law works in modern South Asia, but also about how it has been used to create South Asia—its borders, nations, politics, citizens and communities.

Law and Modern Social Thought. This course examines several influential attempts to construct social theories of law and to use legal materials for systematic social theorizing, during the period from the mid-16th century to the early 20th century. The seminar will focus on a number of major theorists characterized the distinctive elements of the legal order of "modern" western societies and explained their social foundations.

Law, Political Theory and Constitutional Design in the US. This seminar examines the ways in which legal and political theories have been used in the past and are likely to be used in the future to shape the American legal system. The seminar will focus on the development of constitutional law and political theory in the United States. It will be taught by experts in constitutional law and political theory.

Political Science, Law and Social Justice. This course considers a range of policy implementation and dispute resolution generated by the enforcement of narcotics laws are reviewed and the particular issues raised by the government's attempts to deal with the problem of drug-addicted inmates. The course includes joint study of selected works of art, including paintings, sculpture, photography, and architecture. The seminar examines evidence law, procedures and various topics in criminal law, tort law, family law and other areas and also compares "rational actor" and psychological perspectives on decision making by juries, judges, attorneys and litigants.

Legal and Social Justice. This course considers a number of questions relevant to the relationship between law and social justice including: What factors would lawyers with conservative views use when making legal decisions (courts versus legislatures versus bureaucratic agencies)? Whatever path toward social justice is followed, how does one measure one's effectiveness? To begin with questions in real-life situations, the course will feature presentations by classroom teachers and clinicians associated with Boalt Hall who work in the area of public interest and social justice.

Law and Technology Writing Seminar. This seminar provides a structured environment for second-year law students interested in making a case for or against the demand for increased restrictions on the use of "new media." Topics covered include theories of free speech, the special role of the press, defamation and the relationship between public and private interests. Emphasis is also placed on the importance of social and economic policy in the context of the First Amendment. The seminar explores the relationship between the law and the "new media." Topics covered include theories of free speech, the special role of the press, defamation and the relationship between public and private interests. Emphasis is also placed on the importance of social and economic policy in the context of the First Amendment.
Joint venture guidelines of the Federal Trade Commission and Department of Justice. The course includes discussion of recent debates over antitrust enforcement in high-tech markets and evaluation of the different sides that debate and applicability to recent and pending cases.

Modern Chinese Law. This course examines the full range of legal concepts in modern China. It concentrates on post-1949 developments in the People’s Republic of China, but touches upon earlier concepts that have shaped China. Special emphasis is paid to the Maoist version of the law and the post-1978 developments toward economic modernization through the legal structure.

Negotiations: Theory and Practice. Primarily through simulation exercises and role playing, this course offers alternative approaches to negotiation and the requisite skills associated with each. Students negotiate mock problems based on a prepared set of facts. Among the topics are preparation, opening offers, influence testing and evaluation, client counseling, tactics, communication skills, psychological barriers to conflict resolution, and related skills and techniques.

Ocean and Coastal Law and Policy. This course examines the role of law and policy in the development of the oceans. Special emphasis is placed on the United Nations Convention on the Law of the Sea and its implications for the management of the oceans. The course provides an introduction to the international ocean law and its application to specific areas such as marine pollution, intellectual property, and resource management.

Patent Law. This course covers the major aspects of patent law as currently practiced in the United States, including statutory requirements, the substantive and procedural law of patent inventions as well as the rights of those patent inventors and non-inventors. The course explores the role of patent law in the economy and its impact on innovation and technology. Special emphasis is given to the role of the United States Patent and Trademark Office in the administration of patent law and its impact on innovation and technology.

Patent Litigation. This course is a hands-on introduction to the practice of patent litigation. The course covers the substantive law and procedural rules of patent litigation in the United States. Special emphasis is given to the role of the United States Patent and Trademark Office in the administration of patent law and its impact on innovation and technology.

Pensions and Employee Benefits. This course is designed for students who are interested in employment and labor law and business planning. The course follows the guidelines of the Employee Retirement Income Security Act of 1974 (ERISA) and provides an introduction to the legal and ethical issues related to the design, implementation, and operation of retirement plans and the taxation of employee benefits.

Pre-Trial Civil Litigation. This course is designed to acquaint students with pre-trial litigation practice in typical civil cases. The course covers the substantive law and procedural rules of civil litigation in the United States. Special emphasis is given to the role of the United States District Court in the administration of civil litigation and its impact on the litigation process.

Pre-Trial Criminal Litigation. This course examines the fundamental structure of the criminal court system, from arrest to disposition. It focuses on the creative preparation of the criminal case for trial, including how to evaluate a criminal case and how to file pre-trial motions that will maximize the likelihood of a fair disposition for the criminal defendant. The course explores real-life aspects of criminal representation, including traditional and nontraditional courtroom techniques, and also promotes thoughtful discussion of the criminal justice system and the inherent abuses that pre-dominate.

Regulatory Rights in the Biotechnology Industry. This course introduces students to the intellectual property law that specifically applies to the biotechnology industry. The course addresses the role of patents, trademarks, and copyrights in the biotechnology industry. The course also explores the implications of new technologies on intellectual property law and the role of the United States Patent and Trademark Office in the administration of patent law and its impact on innovation and technology.

Remedies. Remedies is a practice-oriented exploration of the substantive and strategic issues associated with the remedies available to litigants in a variety of settings. The course explores the role of the United States District Court in the administration of civil litigation and its impact on the litigation process.

Securities Regulation I. This course concentrates on the regulation of the distribution of securities and corporate finance transactions under the Securities Act of 1933 and the Securities Exchange Act of 1934. The course provides an introduction to the legal and ethical issues related to the regulation of securities and corporate finance transactions and the role of the United States Securities and Exchange Commission in the administration of securities law.

Securities Regulation II. This course concentrates on the regulation of trading of securities on stock exchanges and in the over-the-counter market. The course examines the mechanics of making secured loans, the role of the United States Federal Reserve System in the administration of the monetary system, and the impact of the regulation of securities and corporate finance transactions on the economy and society.

Seminars in Education Law and Policy for the 21st Century. In recent years, the aspirations of U.S. educational policy toward elementary and secondary education have been driven by the need to meet the challenge of diversity and choice. This seminar looks both at the future education agenda for the next generation. The role of the judiciary has been critical in the shaping of educational reform, school vouchers and charter schools, and educational accountability strategies are among the topics explored.
Separation of Powers. This course provides an in-depth examination of the relationship between the three branches of federal government by reviewing different theoretical approaches to the separation of powers and then examining the checks and balances that each branch has over the other.

Sex Discrimination and Law. This course analyzes the legal approach to distinctions based on sex. The course explores the theory and practice of sex-based inequality, and charts the development of legal avenues of redress.

Sexual Harassment Law. This course examines the substantive law applicable to sexual harassment cases in various settings including employment, schools, housing and public places, with an emphasis on employment. Evidentiary and other practical problems in litigating sexual harassment cases are considered and current developments in the law and their underlying legal theories are analyzed.

Sexual Orientation and the Law. The course analyzes legal theories are analyzed. current developments in the law and their underlying legal theories are analyzed. The course focuses on the theory and practice of sex-based discrimination and issues of gender.

Social Justice: Skills and Practice Issues. This skills and policy course emphasizes preparing students for public interest practice and representation of indigent and other marginalized clients.

Social Justice Writing Seminar: The Role of the Bar. This seminar examines important issues for inflation; integrating corporate and personal income taxes; tax incidence; tax expenditures, wealth and property taxes; death and gift taxes; tax reform; value added taxes; Social Security taxation; incentives for saving, work and investment; and tradeoffs among equity, social policy and efficiency.

Techniques of Financial Analysis for Lawyers. This survey course is designed to introduce the law student to the concepts and principles of finance, as they interrelate with the practice of general business law. The course covers the conceptual frameworks and models that do not have a significant business background. The course focuses on financial decision-making, including financial forecasting; investment analysis; investment design; determining the cost of capital; valuation of businesses; mergers and acquisitions.

Telecommunications. This course examines the statutory, administrative and constitutional foundations for the regulation of video, voice, data and audio communications. Course material includes broadcast, cable, satellite, wireless, and internet, as well as new and emerging communications technologies. The course covers the historical development of the law and technologies at issue and focuses on the major issues currently being debated in several key areas of telecommunications regulation.

Three Strikes and You're Out in California Seminar. The focus of this seminar is the 1994 California "three strike" legislation and initiative.

Theories of Rights. This philosophical course considers the nature of rights encompasses both moral and legal rights. Some of the general, philosophical problems related to the foundations and structure of rights claims will be considered and examples of rights such as rights to subsistence, democratic rights, cultural group rights, property rights, constitutional rights will be discussed. Critiques of rights from Marxist, feminist, libertarian, and conservative perspectives will be examined.

Trade Secrets. Industry increasingly emphasizes technology as a means of efficiency and competitive success. This course is designed to explore the theoretical and practical aspects of protecting information as a trade secret. It examines the basic legal doctrines and social issues that underlie and address the process of trade secret litigation. Trademarks. This advanced course in international trademark law and practice covers various theories of trademark/trade name infringement and dilution, including defenses such as fair use, and explores mechanisms of trademark protection globally (such as international treaties and international protection strategies). The course also covers trademark issues in cyberspace in depth, as well as rights of publicity, trade dress, false advertising and trademark licensing issues.

Trial Practice: Civil. This basic course in trial practice focuses on trial advocacy skills, including factual and legal preparation for trial, trial objection, introduction of evidence, direct examination of expert witnesses, cross-examination of expert witnesses, opening statements, closing arguments, jury selection, and courtroom communication skills. The heart of this course is study of trial problems that are videotaped and candidly critiqued.

Trial Practice: Criminal. This course is designed for students who are interested in trying criminal cases. The emphasis is on courtroom practice, although some written work is required. The class has covered include client interviews, initial stages of the criminal process, objections to evidence, preliminary hearings, and pre-trial motion hearing.

Trial Preparation and Practice I & II. This advanced two-semester skills course immerses students in the art of trial advocacy, providing them the opportunity to work with the world's most eminent trial attorneys past and present. Students conduct individual exercises constituting the "building blocks" of a trial: voir dire, opening and closing statements, direct and cross examinations, laying foundation, impeachment, rebuttal, etc. Students gain an understanding of the history, purpose and mechanics of introducing percipient testimony, expert opinion, objects, writings and demonstrative material into evidence.

Tribal Legal Systems. This seminar examines tribal legal systems of the past and present including changes and continuity in tribal law since European contact. This is in effect a comparative law seminar, with comparisons made among tribes and with U.S. law. It provides a brief historical and legal outline of federal Indian law but the focus is on the laws developed by Indian tribes and tribal courts rather than the laws that have been imposed upon them. There is a particular focus on the law and culture of the Hopi Tribe.

Twentieth-Century American Legal History. This course traces the history of American law from the adoption of the 14th Amendment (1868) to the present, focusing on different conceptions of the judicial role in protecting fundamental rights, the appropriate relationship between national and state legal systems, and the growth of a national positive state. The development and interaction of those issues are analyzed in the distinct historical circumstances of Reconstruction, Progressivism, the New Deal, the civil rights movement, the War on Poverty, and the environmental movement.

Victimless Crime. Is victimless crime a meaningful category of penal offenses or a law reform slogan without any real policy implications? This seminar examines contemporary attempts to address the general topic and then considers debates about drug control, pornography, firearms, and gambling as case studies in victimless crime controversies.

Water Law. This course emphasizes western water law (with special attention to California). It deals at some length with public rights in water, the public trust, some legal rules governing water rights, concepts of the public's interest, the concept of water withdrawals and use, and different methods to address natural resource issues in a way that is required to be used in the public interest.

Women and Crime. This course focuses on the traditional concerns about crime, but with an emphasis on women's involvement in "ordinary" criminality. The literature will look at theories of criminal behavior, studies of the differential treatment of men and women while in the criminal justice system, and shifts in trends of men's and women's criminality historically and comparatively.

Workshop on Environmental Policy. The workshop is an opportunity for students to work directly with and counsel governments and NGOs on issues involving environmental law and policy. Working in small groups, students will choose from a variety of assignments involving environmental litigation, mediation and negotiation, mediation and negotiation, direct negotiations with in-house counsel to shape the scope of the assignments, and produce a written public and the organization's needs. Past projects included issues related to hazardous waste cleanup, mine pollution in a foreign country, land use, natural resource damages and dredging. Students also meet intermittently to discuss issues of general concern, such as ethical considerations, satisfying client goals, and reconciling personal values and the client's goals.
Boalt Hall Clinics

Subject to credit limitations in the Academic Rules and the appropriate approvals, second- and third-year students may earn credit for clinical experience as follows:

The Center for Clinical Education

Federal Practice Clinic. Clinic students represent civil rights plaintiffs and other litigants in actual cases before federal trial and appellate courts and agencies. Students interview clients, investigate cases, plan litigation, write briefs and motions, and may appear and argue cases under the courts’ student practice rules.

International Human Rights Law Clinic. Students provide direct legal services to asylum-seekers and victims of human rights abuses, preparing asylum cases and conducting international and national investigations and litigation concerning human rights violations. Students in the clinic recently have worked on human rights issues involving the treatment of Haitian migrant workers in the Dominican Republic, abuses suffered by gays and lesbians in Mexico, accountability for human rights abuses in El Salvador, and the administration of justice in Bosnia.

Samuelson Law, Technology, and Public Policy Clinic. As the clinic begins operating during the 2000–01 academic year, students will file friend-of-the-court briefs, comment on proposed legislation and regulations, and provide legal assistance in cases that involve important issues relating to law and technology. Potential cases and projects may include advising and representing individuals and nonprofits in Internet privacy issues, and groups and organizations evaluating laws, regulations and policies relating to technology; and filing amicus curiae briefs in the federal district and circuit courts and in the U.S. Court of Appeals for the Federal Circuit.

East Bay Community Law Center. The East Bay Community Law Center offers students an opportunity to work in a clinical setting providing free legal services to residents of Oakland and Berkeley. The Center focuses on the areas of housing law, public benefits, community economic development, and legal services for people with AIDS. Students receive training in the substantive legal areas and, under the supervision of staff attorneys, handle their own client caseload.

Faculty-Supervised Clinics

Child Advocacy Clinic. This clinic is offered in cooperation with the National Center for Youth Law and Legal Services for Children in San Francisco. Students work on class action suits and legislative reform projects on behalf of neglected, dependent, and abused children or children at risk of losing welfare or health benefits and provide direct services to individual children in guardianship, emancipation and other juvenile proceedings. Clinic students have also submitted amicus curiae briefs for children in precedent-setting adoption and custody cases in California and other states.

Domestic Violence Clinic. Students work in one of several different civil or criminal domestic violence legal agencies in the East Bay Area, or with the instructor on state legislation. In addition, they may work on post-conviction issues on behalf of white women in state prisons and employment issues affecting victims of domestic violence. Students are given the opportunity to: work on class action suits; draft memoranda, op-ed pieces and motions; represent clients at hearings; research policy issues and attend meetings with government officials, judges and legislators.

Hopé Appellate Court Clinic. Students work with the appellate court of the Hopi Tribe in northeastern Arizona to resolve cases before the court and to assist the court in developing the Tribe’s common law. The cases raise many issues of first impression in criminal, civil rights, contracts, constitutional and family law, as well as questions involving civil and criminal procedure and intervillage land disputes. The work is done individually and in teams under the direction of faculty supervisors.

Field Placements

Field placements include work in public interest, nonprofit or government agencies under the supervision of experienced attorneys, and judicial externships for state or federal court judges.

Legal Studies

(School of Law, Boalt Hall)

Program Office: 2240 Piedmont Avenue, (510) 642-4038
http://www.ls.berkeley.edu/dept/legal

The legal studies major is under the academic supervision of the School of Law faculty.

Program Coordinator: Charles McClain, Jr., Ph.D., J.D.

The Major

The legal studies major provides undergraduate students with an opportunity to become familiar with legal ideas, legal institutions, and the legal process. It is designed to provide tools for reasoned appraisal of how the law works and of the policies that underlie it. The major is based firmly on the view that the study of law and justice has a rich humanistic tradition and that its pursuit can encourage sustained reflection on fundamental values.

Legal studies courses are taught by members of the Law School faculty, including humanities scholars and social scientists who teach in the graduate program in Jurisprudence and Social Policy. These courses build on the contributions of philosophy, history, sociology, political science, economics, psychology, and anthropology, as well as legal scholarship. It should be noted that legal studies is a liberal arts major in the College of Letters and Science. The major was not established for the purpose of preparing students for law school. It is designed for undergraduate students who are interested in law as a field of critical inquiry, irrespective of their ultimate career objectives.

Lower Division Requirements. One term of course work is required in each of the following areas: introductory statistics, introductory economics, introductory philosophy, and European history. Students may declare the major after completing course work from two of the four areas. These courses must be letter graded, and only one course may be repeated for credit. The cumulative grades must be 2.0 or better. A list of courses offered at Berkeley which satisfy these prerequisites is available at the Legal Studies Program office and on the Legal Studies Web site.

Upper Division Requirements. A minimum of 32 upper division units is required for completion of the major. All of these units must be taken for a letter grade. Students must complete one course from each of the following four groups of courses: A. Legal and Social Theory; B. Historical/Comparative: C. Principles and Problems of Substantive Law; D. Administration of Justice. The remaining units may be completed with courses from within the department, or with up to three courses from an approved list of law-related courses offered by other departments.

The rationale for the structure of the legal studies curriculum becomes apparent if a few words are said about each of the course groupings referred to above. The Group A requirement insures that all students are exposed to conceptual analysis and broad intellectual perspectives. Group B courses are required to provide students with the capacity to draw on the insights of legal traditions other than their own. The courses from Group C are meant to acquaint students with selected forms of legal ordering—e.g., the substantive law of crimes, property, negligence—and to assure that students can relate legal doctrines to social policies and historical contexts. The Group D 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 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 enroll in H195, the legal studies honors course, for one or two semesters (at the instructor’s option) and to prepare an honors thesis.

Further information on the major in legal studies may be obtained from the program office and the Web site.

Only some of the following courses are offered in any given year. Consult the Schedule of Classes for up-to-date information on course offerings.

Lower Division Courses

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 letter-grade basis. Section 2 to be graded on a passed/not passed basis. The Berkeley 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. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and from semester to semester.

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.

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 lecture per week. Must be taken on a passed/not passed basis. Small group instruction in topics not covered by regularly scheduled courses. Topics may vary from year to year. (F,SP)

Upper Division Courses

100A. Foundations of Law: The Quest for Justice. (4) Three hours of lecture and one hour of discussion per week. Introduction to law for the liberal arts student. The purpose of the course is to familiarize students with major legal ideas, legal institutions, and legal processes; to provide a comparative and historical perspective on law; and to highlight basic philosophical problems in the quest for justice.

100B. Foundations of Law: The Quest for Justice. (3) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: 100A or consent of instructor. An exploration of the fundamental values implicated in the idea of law through a set of topical readings or through the close study of one or more great philosophical works. This course develops the concepts introduced in 100A. The set of topics and the philosophical works studied change from year to year.

103. Theories of Law and Society. (4) Three hours of lecture and one hour of discussion per week. An historical and cross-cultural examination of law, morals and social development, with special emphasis on the social thought of the 18th and 19th centuries and including the writings of Marx, Maine, Durkheim, Weber and other contemporary figures.

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
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 pursued? What principles can be identified for evaluating the effort to control disapproved activities through criminal law?

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 sixteenth to eighteenth centuries, concluding in discussion of the debate over ratification of the U.S. Constitution.

114. Law in the Work of Art. (4) Three hours of lecture and one hour of discussion per week. The study of selected works of art, including poetry, music, and architecture, as a basis for introducing students to the tradition of philosophical speculation regarding the relation of beauty—the way art manifests itself—to goodness—the ultimate end of law.

115. The Ethos of the Ancient Greeks. (4) Three hours of lecture and one hour of discussion per week. An introduction to the basic themes of Ancient Greek thought regarding the proper ordering of humankind's work, and to the individuals articulated in the epic, tragedy, and philosophy. Based primarily upon readings selected from the ancient sources. (F,SP)

116. Legal Discourse 1500-1700. (4) Three hours of lecture and one hour of discussion per week. This course reviews the history of legal thought and legal discourse from the late medieval period to the Enlightenment. Topics to be considered 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 England, there will be some consideration of differences between English and continental European legal thought.

120. Conceptions of Punishment: Ancient and 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 former cultures such as Medieval Europe, Ancient Israel, and Ancient Greece. The topics include wrongdoing; suffering; deterrence, vengeance, punishment; excuses; retribution; determinism; fate; collective responsibility. Most of the readings are in English. The Greek tragedies and the Week's Greek tragedy.

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, world maxims for success, and the operation of law by the church and by divine force. Nearly all of the assigned readings are in the Bible.

142. Law and Bureaucratic Organizations. (3) Two hours of lecture and one hour of discussion per week. Legal theory usually presupposes only individual actors and organizations that recognize organizational giants, e.g., General Motors. This course explores the implications of taking organizations seriously as legal actors. Issues include the legal rights of organizations, legal control of organizational law, ethical questions, and the relationship between political and constitutional developments and legal discourse. Although the emphasis is on England, there will be some consideration of differences between English and continental European legal thought.

145. Law and Economics I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Together Law and Econ I and II provide a comprehensive introduction to economic analysis of law. Courts need not be taken in numerical order; nor is one a prerequisite to the other. The course will apply microeconomic theory to legal rules and procedures. Emphasis will be given to the economic consequences of liability rules, remedies for breach of contract and the allocation of property rights. The jurisprudential significance of the analysis will be discussed.

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 uses many mechanisms to influence the provision of goods and services. Economists and lawyers have developed a critique of these mechanisms which addresses entitlement reforms in recent years, e.g., deregulation in transportation. The course examines this critique.

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 the self and the relationship between the self and various aspects 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, while it also actively participates in forming the identities of persons and in structuring collective entities such as families, corporations, and municipalities. This course will explore more theoretical approaches to the reciprocal relationship between law and the different social actors that it governs.

155. Government of the Family. (3) Two hours of lecture and one hour of discussion per week. The course examines the regulation of conventional family formation and dissolution and focuses on selected topics in child welfare law. Topics include the state role in reproductive decisions, entry into marriage, divorce, economic consequences of divorce, and child custody disputes.

160. Punishment, Culture, and Society. (4) Three hours of lecture and one hour of discussion per week. Criminal punishment in the United States. (1) Forms, justifications, and relation to larger cultural and societal change. (2) Specula in general on the meaning and direction of current trends. (F,SP)

161. Law in Chinese Society. (4) Three hours of lecture and one hour of discussion per week. The course examines the form that the basis of the Chinese legal system, and institutions of pre-1911 society, and the expression and rejection of the traditional concepts in the laws of the Nationalist period and the People's Republic.

162. Courts and Social Policy. (4) Three hours of lecture and one hour of discussion per week. The course examines controversies over the capacity of the courts. These issues will be examined by tracing changes in the business of courts and exploring the emergence of these issues in their social context.

163. Juvenile Delinquency and Juvenile Justice. (4) Three hours of lecture and one hour of discussion per week. The course examines controversies over the capacity of the courts. These issues will be examined by tracing changes in the business of courts and exploring the emergence of these issues in their social context.

164. Criminal Justice and Victimless Crime. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 170 or declared legal studies major with senior standing. This course will consider the definition and policy significance of the concept of victimless crime in modern industrial states. Materials on 19th- and 20th-century debates on criminal law and harm to others will be reviewed and applied to four topics of contemporary concern: drugs, pornography, handguns, and prostitution. Additional subjects under consideration include drunk driving and gambling. Major unifying themes are the harm-to-self distinction, the varieties of methods of state regulation, the nature of police work and behavior on vice control, and the pattern of social and legal change that has been occurring in the area of victimless crime. A midterm and final examination will provide the basis for student evaluation.

166. 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 reproduction and sexual behavior. We will consider two theoretical aspects of the problem: first, theories of how law regulates social behavior and second, more general theories about how reproduction is socially regulated. Armed with these theoretical perspectives, the course will then examine closely a number of legal issues, including sterilization, abortion, and contraception.

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 of crime and problems of the process by which suspected criminals are apprehended, tried, sentenced, punished? Past and current trends and policy issues will be discussed. (F,SP)

175. African American and Constitutional History: 1636-1800. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Junior or senior standing. It is recommended that students have completed a course in African American 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 18th century. Topics include Progressive Era Regulations, federalism, the modern legal order, and federalism.

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 a course in African American history or political science that deals with American history or American government prior to taking 177. Overview of American legal and constitutional history from colonial times to the present. Topics include colonial legal institutions, early constitutional history, the Civil War, modern business regulation, race and the law, history of the legal profession, and the modern constitutional order. (F,SP)

178. Seminar on American Legal and Constitutional History. (3) Two hours of seminar per week. Prerequisites: Consent of instructor. Enrollment is limited. This course will provide advanced 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. Prerequisites: 171 or declared legal studies major with senior standing. This course will examine the comparative approach to constitutional law, and the role of comparative constitutional law in the analysis of law in a number of countries based on selected high court opinions.

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 conflict, adapting to social change, and fostering social solidarity. In doing so, it will assess the nature and limits of law as well as contemporary perspectives on social control and social change.

184. Sociology of Law. (4) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: Sociology 1, 3, 3AC, or consent of instructor. Selected legal rules, principles, and institutions treated from a sociological perspective. Influence of culture and social organization on law; role of law in social change; social aspects of the administration of justice; social knowledge and the law. (F,SP)

C184. Sociology of Law. (4) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: 1, 3, 3AC, or 34 or 3AC or consent of instructor. Selected legal rules, principles, and institutions treated from a sociological perspective. Influence of culture and social organization on law; role of law in social change; social aspects of the administration of justice;
190. Seminar on Topics in Law and Society, (3-4) Course may be repeated for credit. Two or three hours of seminar per week plus individual conferences. Prerequisites: Consent of instructor. Advanced study in law and society with specific topics to be announced.

H195A-H195B. Honors in Legal Studies. (4) Hours to be arranged. Students may take H195A either letter-graded or In-Progress. Prerequisites: Senior standing, acceptance into Honors Program in Legal Studies. Study of an advanced topic under the supervision of the instructor leading to the preparation of a senior honors thesis. One or two semesters at the instructor’s option. (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 to four hours of lecture per week. Must be taken on a passed/not passed basis. Small group instruction in topics not covered by regularly scheduled courses. Topics may vary from year to year. (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. Prerequisites: Upper division standing. Consent of instructor and approval of Program Chairman. Enrollment restrictions apply. Consult the Legal Studies department for more information. (F,SP)

Letters and Science
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Chair of the Department of Letters and Science: Susan Schweik, Ph.D. (English)
Assistant Deans: Benjamin Brinner, Ph.D. (Music)
Harry L. Morrison, Ph.D. (Physics)
Susan Schweik, Ph.D. (English)
Associate Deans of the Undergraduate Division: Andrew L. Griffin, Ph.D. (English)
Leanne Hinton, Ph.D. (Linguistics)
Divisional Deans: Paul Licht, Ph.D. (Biological Sciences)
Ralph J. Hexter, Ph.D. (Humanities)
P. Buford Price, Ph.D. (Physical Sciences)
Professor of the Arts: George W. Beal (Letters and Science)
Associate Deans of the Graduate Division: Kwong-loi Shun, Ph.D. (Graduate 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 specialized 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 credit and be admissible if they meet all other admission criteria.

Transfer students with 56 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 breadth requirements, or the general education 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 breadth requirements of the college. Transfer students who apply from community colleges in California have the option of fulfilling 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 which, if completed before transfer, 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. Transfer applicants 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 have completed the minimum subject preparation in the major with a grade-point average 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 56 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 which appear in the College of Letters and Science’s Guide to Earning Your Degree. A 15-unit class schedule per semester is considered to be a normal course load; a class list of fewer than 13 units requires the 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 the catalog. 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 (A course) during the freshman year and the second half of the requirement (B course) during the sophomore year. Students must complete the requirement through course work according to the requirements of the semester system, whether the course work 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 course work, must be completed without delay.

3. Foreign Language. This requirement assures that students who graduate from the college will have a knowledge of the language of a culture other than their own. Students who have not satisfied the language requirement at the time of admission must complete it without delay. The requirement may be satisfied by completion of the first year of one foreign language in high school with a minimum grade of C+, (b) 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 (c) by demonstration of equivalent knowledge 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 (lower division language instruction excepted) 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 spread over the four years of college attendance. See the College of Letters and Science’s Guide to Earning Your Degree for details and a list of the approved courses that you may take to fulfill the requirement.

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) 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, Dutch studies, environmental sciences, ethnic studies, East Asian studies, legal studies, mass communications, Middle Eastern studies, peace and conflict studies, political economy of industrial societies, religious studies, and 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 before the third year of one foreign language at Berkeley, or its equivalent elsewhere, may, in consultation with a faculty member, petition to be declared a major.

The College of Letters and Science is committed to the principle that students graduate with breadth of knowledge and the skills to apply this knowledge in their work and to their daily lives. The college is committed to a teaching program that will provide students with a variety of experiences and approaches to their work so that they may become educated, discerning, and compassionate participants in the life of their society.
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:

1) 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.

2) Grade-point average requirements: Students must maintain a minimum overall grade-point average of 2.0 in upper division courses required for the minor program. At present the college offers minor programs in the following departments:

- African American Studies
- Humanities
- Social Science
- Art, History of Art, Practice of Art
- Asian Studies
- Chinese Studies
- Japanese Studies
- Korean Studies
- Southeast Asian Studies
- Astrophyics
- Celtic Studies
- Classics
- Greek
- Latin
- Classical Civilization
- Demography
- Dutch Studies
- Earth and Planetary Science
- English
- American Literature
- Literature in English
- Ethnic Studies
- Asian American Studies
- Chicano Studies
- Ethnic Studies
- Native American Studies
- French
- French Civilization
- French Language Studies
- French Literature
- Geography
- German
- Italian Studies
- Mathematics
- Music
- Near Eastern Studies
- Ancient Egyptian and Near Eastern Civilizations
- Arabic
- Hebrew
- Persian
- Turkish
- Peace and Conflict Studies
- Philosophy
- Psychology
- Political Economy of Industrial Societies
- European Studies
- Rhetoric
- Scandinavian
- Slavic Languages and Literatures
- Russian Language
- Russian Language, Literature, and Culture
- Russian Literature
- Slavic Language and Literature
- South and Southeast Asian Studies
- South Asian Civilization
- South Asian Archaeology
- Spanish and Portuguese
- Spanish Language and Literatures
- Luso-Brazilian Language and Literatures
- Theater, Dance, and Performance Studies
- Theater and Performance Studies
- Dance and Performance Studies
- Undergraduate and Interdisciplinary Studies
- Creative Writing
- Lesbian, Gay, Bisexual, and Transgender Studies
- Religious Studies
- Women’s Studies

Students should consult the department or group in charge of the minor for additional requirements and specific information regarding the minor program in which they are interested. Admission to the minor and certification of completion of the minor are determined by the department or group in charge of the program. When a student completes 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 and Interdisciplinary Studies

Undergraduate and Interdisciplinary Studies (UGIS) is located in 301 Campbell Hall ((510) 642-0108). The mission of UGIS 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. At present UGIS administers the field major in interdisciplinary studies, the individual major, and the group majors in American studies, cognitive science, environmental sciences, mass communications, and religious studies. Minor programs are offered in creative writing; lesbian, gay, bisexual, and transgender studies (LGBT), religious studies, and peace and conflict studies. UGIS also supports the following majors and minors in international and area studies (101 Stephens Hall, (510) 642-4466): Asian studies, development studies, European studies, Latin American studies, Middle Eastern studies, peace and conflict studies, and political economy of industrial societies (PEIS).

In addition to our interdisciplinary majors, UGIS sponsors a wide range of academic programs and services for undergraduates, under the leadership of the dean of undergraduate education at Berkeley. A world-class research university such as ours offers something special to undergraduates who know how to make the most of it, and UGIS 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 UGIS are described below.

The Center for the Teaching and Study of American Cultures (120 Wheeler Hall, (510) 642-2264) administers courses that fulfill the campus American Cultures requirement. These courses address theoretical and analytical issues relevant to understanding race, culture, and ethnicity in American history and society.

The College Writing Programs (216 Dwinelle Annex, (510) 642-5570), designed to help undergraduates establish fluency and control over their reading and writing skills, are also part of UGIS.

The Freshman Seminar Program is also housed in UGIS. Seminars are created and taught by faculty members from nearly every campus department. The Freshman Seminar Program office distributes descriptions of these special course offerings to freshmen in time for Tele-Bears registration each semester.

UGIS also sponsors the Western civilization course series (UGIS 44A-44B-44C).

The UC Berkeley-Washington Program, also administered by UGIS, allows undergraduates to spend a semester in Washington, D.C., combining course work with internships.

The Office of Undergraduate Research (OUR) seeks to involve undergraduates more deeply in the research life of the University. To this end, OUR coordinates and develops programs and resources that bring undergraduates into the field, laboratories, and archives. This office administers the Undergraduate Research Apprenticeship Program, the Haas Scholars Program, and the Benjamin Scholars Program, and maintains a central research opportunities web site: http://research.berkeley.edu.

The Scholarship Connection coordinates applications for scholarships and awards based on academic achievement and social or political contribution. Campus committees for the Rhodes, Marshall, Truman, and several other distinguished scholarships are housed here. Staff work to identify talented undergraduates and assist them in the application process.

Organizational Units

- African American Studies
- American Studies
- Ancient History and Mediterranean Archaeology
- Anthropology
- Architecture
- Art
- Practice of Art
- History of Art
- Asian American Studies
- Astronomy
- Biostatistics
- Buddhist Studies
- Celtic Studies
- Chemistry
- Chicano Studies
- Classics
- Cognitive Science
- College Writing Programs
- Comparative Literature
- Computer Science
- Demography
- Development Studies
- Dutch Studies
- Earth and Planetary Science
- East Asian Languages and Cultures
- East European Studies
- Economics
- Law and Economics
- English
- Environmental Sciences
- Ethnic Studies
- Ethnic Studies Graduate Group
- Film
- Folklore
- French
- Geography
- German
- History
- Integrative Biology
- Interdisciplinary Studies
- Italian Studies
- Latin American Studies
- Legal Studies
- Linguistics
- Logic and the Methodology of Science
- Mass Communications
- Mathematics
- Medieval Studies
- Middle Eastern Studies
- Molecular and Cell Biology
- Music
- Native American Studies
- Near Eastern Studies
- Peace and Conflict Studies
- Philosophy
- Physical Science
- Political Economy of Industrial Societies
- Political Science
- Population Studies
- Psychology
- Religious Studies
- Rhetoric
- Romance Philology
- Scandinavian
- Science and Mathematics Education
- Social Science
- South Asian Civilization
- South and Southeast Asian Studies
- Slavic Language and Literature
- South Asian Archaeology
- Spanish and Portuguese
- Spanish Language and Literatures
- Theater, Dance, and Performance Studies
- Theater and Performance Studies
- Dance and Performance Studies
- Undergraduate and Interdisciplinary Studies
- Creative Writing
- Lesbian, Gay, Bisexual, and Transgender Studies
- Religious Studies
- Women’s Studies

B prefix=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
†Recipient of Distinguished Teaching Award
*Professor of the Graduate School

Letters and Science / 309
Lower Division Courses

16. The Age of the Earth. (4) 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 will introduce students to the cultural impact of science by using the determination of the age of the Earth as a focal theme. The course will teach students how to evaluate technical information (e.g. as reported in the media), and will cover historical and cultural aspects of the topic before delving into the science involved. (SP) Jeantoz, Renne

17. Scandinavian Civilization. (4) Students will receive 2 units upon 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 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. (SP) Sanders

18. Genetics and Contemporary Social Issues. (3) Students will receive two units for 18 after taking Molecular and Cell Biology 41 or C41X or Plant Biology C41X. Two hours of lecture and one hour of discussion per week. College Courses foster and support the ideals of liberal arts education at the highest level of excellence. This College Course explores a number of contemporary issues arising around advances in the science of genetics and molecular biology. The focus is on the impact these will have on our everyday life: how genetics is providing solutions for long-standing problems faced by society as well as moral and ethical concerns that arise from new biological investigations. Basic human genetics, the biochemistry of genes, and its presentation within the context of topics that are of societal interest. Lectures and discussions will cover diverse topics such as the DNA of Thomas Jefferson and his descendants, sequencing the human genome, parasitology of genes, the genetics of learning, solving crimes using PCR and DNA, human sexual orientation, and the genetics of left-handedness. (F,SP) Garriga, Tanouye, Will

19. Drugs and the Brain. (3) Three hours of lecture and one hour of discussion per week. College Courses foster and support the ideals of a liberal arts education at the highest level of excellence. This College Course deals with the history, chemical nature, botanical origins, and effects on the human brain and behavior of drugs such as stimulants, depressants, psychedelics, anxiolytics, antipsychotics, steroids, and other psychoactive substances of both natural and synthetic origin. The necessary biological, chemical, and psychological background material for understanding the content of this course will be contained within the course itself. No prerequisites. (F) Presti

21. Medieval Memories. (3) Three hours of lecture per week. College Courses foster and support the ideals of a liberal arts education at the highest level of excellence. This College Course approaches the shaping of individual memories at three points in time: the contemporary junctures in the European Middle Ages—broadly the 4th, 8th, and 12th centuries. We will read a few major works of verbal art (conventionally “great books”) from these periods and touch upon visual and spatial arts, and on schools and other social institutions consciously designed as sites for constructing and revising individual and cultural memory. Framing the three chronological units will be an introduction and conclusion focusing on our “medieval memories”—on the challenges and provocations to “modernity” these works present, and the stimulus they offer to critical re-flection on how we make memorable, how and why. (SP) Middleton

22. Greek Myth and the Modern Western World. (3) Three hours of lecture and one hour of discussion per week. College Courses foster and support the ideals of a liberal arts education at the highest level of excellence. This College Course will study some of the principal texts and motifs in ancient Greek myth, and their internal symbolic logic, and explore their role as catalysts at key points in modern Western culture and society. Texts will include Homer’s Odyssey, Hesiod’s Theogony, Aeschylus’s Oresteia, Sophocles’ Oedipus and Antigone, along with readings from Freud, Cocteau, Anouilh, Saroyan, Camus, Forster, Pound, Auden, Fugard, Moravia, and others, and material from contemporary music and cinema. (F,SP) Anthony, Bulloch

Upper Division Courses

116. Turn-of-the-Century Vienna: Eros and Death, Gender and Race. (3) Three hours of lecture and one hour of discussion per week. College Courses are designed to foster and support the ideals of liberal arts education at the highest level of excellence. This College Course explores representations of sexuality and death, gender, and race within the turbulent social and historical milieu of turn-of-the-century Vienna. Topics include the construction of masculine and feminine identity, psycho-social aspects of rampant erotic adventurism, and the significance of time and death in a decaying, declining empire. Course materials include literary and theatrical texts, film, paintings, and opera. All readings in English. (SP) Goldstein

117. Astrobiology: The Scientific Search for Life in the Universe. (4) Three hours of lecture and one hour of discussion per week. College Courses are designed to foster and support the ideals of liberal arts education at the highest level of excellence. This College Course covers the scientific search for life in the universe, including science philosophy and process; the public’s view of science and the paranormal; support of the search; planetary formation; history of the solar system and the planets and satellites; early earth history and the history of life on earth as revealed in molecular and paleontological data; the processes of biological evolution; planning for a Martian landing; a critical evaluation of supposed indications of extraterrestrial life; and the ethical and theological considerations of planetary exploration. (SP) Lipp

118. Framing the Arts at Berkeley. (3) Two hours of lecture and one hour of discussion per week. College Courses foster and support the ideals of a liberal arts education at the highest level of excellence. This college course will develop historical, critical, and evaluative contexts for some of the arts events and exhibits occurring on campus during the given semester. We will develop languages specific for work in different genres and comparative frameworks for exploring what the works might have in common as products of this particular culture. Ideally students will learn to appreciate the value of experiencing art on campus as participants in an ongoing discursive community. (F) Alteri

119A.C. Californians and Water. (3) Three hours of lecture per week. College Courses foster and support the ideals of a liberal arts education at the highest level of excellence. This College will cover the history and place of water in California’s landscape, climate, water setting, and aquatic environment; then studying the development of the state’s water resources and the impacts on economy, environment, and exploitation of water resources. In a research paper, students will explore the influence of cultural values and beliefs on the discovery, appreciation, and exploitation of California’s water. Students will also be encouraged to speculate on California’s water future and approaches to a wise utilization of this precious natural resource. This course satisfies the American cultures requirement. (F) Narasimhan

119F. Californians and Water Field Trip. (1) One weekend-long field trip. Prerequisites: Open only to students concurrently enrolled in 119A.C. College Courses foster and support the ideals of a liberal arts education at the highest level of excellence. This field trip is an optional adjunct to the Californians and Water College course, 119A.C. It is a weekend field trip to sites of historical, cultural, scientific, aesthetic, and technological interest in California. Students will be required to write an in-depth report based on their observations and the historical, scientific, or technological significance of the sites. (F) Narasimhan

120. The Poetics of Time and Place. (4) Two hours of lecture and two hours of multimedia laboratory per week. College Courses foster and support the ideals of liberal arts education at the highest level of excellence. This College Course will explore and celebrate how cultural construction of time and place in different cultural contexts, including, for example, our own construction of the millennium. The course will in effect comprise a world prehistory and history of ancient cultures, but this will not be a history that simply lists the sequence of great feats and monuments. It will focus on how differently people have perceived their place in the world and in time; how they have perceived history, ancestors, the future: how they have perceived the different scales of place—what is distant, what is familiar.

121. Automobile. (3) Three hours of lecture and one hour of discussion per week. College Courses are designed to foster and support the ideals of a liberal arts education at the highest level of excellence. Organized around a social, technical, and political history of the American automobile, this College Course will examine the co-evolution of the automobile, the industries that support it, and the policies and social structure of American society (with an emphasis on California). The history of America is inextricably bound to the history of modern socio technical systems, among which the automobile in particular stands out for its impacts on liberal arts education at the highest level of excellence. This course takes an interdisciplinary look at the profound cultural effects of the automobile, not only as a technical object, but also as a visible and contested space of cultural meaning. The focus of persistent conflict between American individualism and formal and informal modes of regulation and collective action. (F) Rochlin

122. Renaissance Engineers. (3) Three hours of lecture and one hour of discussion per week. College Courses foster and support the ideals of a liberal arts education at the highest level of excellence. This interdisciplinary College Course focuses on the blossoming of engineering in Renaissance Italy, and its roots in Greek and Roman engineering, architecture, and art. Participants will study the works of the Renaissance artist-engineers Brunelleschi, Taccola, Francesco di Giorgio, and Leonardo da Vinci. The connections between engineering and science and the evolution of engineering into its modern form will also be explored. Students will work on projects in small multidisciplinary teams. (F,SP) Casey, Filipou, Hahn, Tobin
The Major

The undergraduate major in linguistics introduces students to the conditions and techniques of research into the structure, functions, and histories of languages. Since the study of language draws from and contributes to many other fields of study, students choosing the linguistics major are strongly urged to achieve a more than superficial acquaintance with some related but independent field: cognitive science, anthropology, mathematics, computer science, philosophy, rhetoric, English literature, or the literature of a foreign language.

Prerequisites: Completion of Linguistics 100 with a minimum grade of C.

Requirements: Upper Division. The major consists of a four-course core (Linguistics 110, 115, 120, and 130) which includes phonetics and phonology, morphology, syntax, semantics, and language history and comparison. Four or five other courses totaling a minimum of 12 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 these, at least 4 must be selected from upper division and graduate level offerings within the Linguistics Department. The remaining six upper division units must be selected from offerings within the major and approved by the major adviser to complete the major’s minimum degree requirement. The major adviser may, with the student’s agreement, approve additional courses for purposes of research.

Lower Division Courses

1A-1B. Elementary Swahili. (4;4) Four hours of recitation and one hour of laboratory per week. (F,SP)

2A-2B. Elementary Language Tutorial. (3;3) Course may be repeated for credit. Hours to be arranged. Prerequisites: Requires special permission. Apply to Linguistics office. Specially designed tutorials for individuals or small groups needing instruction in African languages that are not normally offered on the Berkeley campus. (F,SP)

3A-3B. Elementary African Language: Xhosa/Zulu. (4;4) Four hours of recitation and one hour of laboratory per week. (F,SP)

5. Language and Linguistics. (4) Three hours of lecture and one hour of discussion per week. An introduction to the scientific study of language. (F,SP)

R5W. Linguistics Writing Workshop. (2) Two hours of workshop per week. Formerly SW 2. A 2-unit writing workshop which must be taken concurrently with Linguistics 5. Satisfies the second half of the Reading and Composition requirement. This writing intensive course involves composition requirements. Additional readings, exercises in writing and in the analysis of writing passages and two large writing assignments on topics related to language and linguistics. (F,SP)

10A-10B. Intermediate Swahili. (3,3) Three hours of lecture and one hour of laboratory per week. Prerequisites: 1B or equivalent. The second half of the Swahili sequence. Students are expected to have mastered the basic conversational skills. Second semester course. (F,SP) Mchombo
10. Introduction to Linguistic Science. (4) Three hours of lecture and one hour of discussion per week. A basic technical introduction to linguistic science. Practice in working with phonetic and transcriptional notation, and in getting an overview of phonology and morphological analysis; basic steps in grammatical parsing and textual analysis. (F, SP)

C105. The Mind and Language. (4) Three hours of lecture and one hour of discussion per week. Formerly 105. Conceptual systems and language from the perspective of cognitive science. How language gives insight into conceptual structure, reasoning, category formation, and our understanding, and the underlying principles of cognition. The relationship between formal linguistics, implications from and for philosophy, anthropology, literature, artificial intelligence, and politics. Also listed as Cognitive Science C101.

106. Metaphor. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: C105 or consent of instructor. The meaning of metaphor in the everyday language and in the sciences. How metaphor works and how it shapes our understanding. The role of metaphor in conceptualizing and organizing understanding. (F)

C107. The Mind and Mathematics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Some background in either cognitive science, mathematics, or another relevant discipline. The development and application of mathematical ideas from the perspective of cognitive science. How ordinary mechanisms of mind (e.g., conceptual metaphor and blending) characterize laws of arithmetic, sets, logic, trigonometry, exponentials, and imaginary numbers. The Metafor of Infinity and its application to infinite sets, points at infinity, infinitessimals, transfinite numbers, and limits. The meaning of Euler’s equation e^{iπ} + 1 = 0. (SP)

51. The Politics of Language. (3) Three hours of seminar per week. The political uses of language. Ideals, prestige forms, bureaucratice, male and female language, politeness and indirectness, language planning, bilingualism, language and attitudes. Enrollment limited to 25 students. R. Lakoff

52. Languages and You. (3) Three hours of lecture per week. This course is intended for the nonspecialist concerned about complex linguistic issues currently salient in political and personal discourse. As individuals, members of families, workers, citizens of this country, and members of the global community, we need to understand how language works in order to make intelligent decisions at all levels. We will examine issues of context and authority; language and gender; language and power; and language in a global context. R. Lakoff

55AC. The American Languages. (4) Three hours of lecture and one hour of discussion per week. A linguistic view of language and culture in the United States. The variety of languages spoken in our country and the issues surrounding them: language and ethnicity, politics of linguistic pluralism versus ideological monolingualism, language and education, language shift, loss, retention, and renewal. Languages include English (standard and nonstandard; Black English), pidgens and creoles, Native American languages, Spanish, French, and immigrant languages from Asia and Europe. This course satisfies the American culture requirement. (F, SP)

98. Directed Group Study. (1-5) Course may be repeated for credit. Must be taken on a passed/not passed basis. Group study of a topic not included in the regular department curriculum. (F, SP)

Upper Division Courses

110. Introduction to Linguistic Science. (4) Three hours of lecture and one hour of discussion per week. A basic technical introduction to linguistic science. Practice in working with phonetic and transcriptional notation, and in getting an overview of phonology and morphological analysis; basic steps in grammatical parsing and textual analysis. (F, SP)

C105. The Mind and Language. (4) Three hours of lecture and one hour of discussion per week. Formerly 105. Conceptual systems and language from the perspective of cognitive science. How language gives insight into conceptual structure, reasoning, category formation, and our understanding, and the underlying principles of cognition. The relationship between formal linguistics, implications from and for philosophy, anthropology, literature, artificial intelligence, and politics. Also listed as Cognitive Science C101.

106. Metaphor. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: C105 or consent of instructor. The meaning of metaphor in the everyday language and in the sciences. How metaphor works and how it shapes our understanding. The role of metaphor in conceptualizing and organizing understanding. (F)

C107. The Mind and Mathematics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Some background in either cognitive science, mathematics, or another relevant discipline. The development and application of mathematical ideas from the perspective of cognitive science. How ordinary mechanisms of mind (e.g., conceptual metaphor and blending) characterize laws of arithmetic, sets, logic, trigonometry, exponentials, and imaginary numbers. The Metafor of Infinity and its application to infinite sets, points at infinity, infinitessimals, transfinite numbers, and limits. The meaning of Euler’s equation e^{iπ} + 1 = 0. (SP)

51. The Politics of Language. (3) Three hours of seminar per week. The political uses of language. Ideals, prestige forms, bureaucratice, male and female language, politeness and indirectness, language planning, bilingualism, language and attitudes. Enrollment limited to 25 students. R. Lakoff

52. Languages and You. (3) Three hours of lecture per week. This course is intended for the nonspecialist concerned about complex linguistic issues currently salient in political and personal discourse. As individuals, members of families, workers, citizens of this country, and members of the global community, we need to understand how language works in order to make intelligent decisions at all levels. We will examine issues of context and authority; language and gender; language and power; and language in a global context. R. Lakoff

55AC. The American Languages. (4) Three hours of lecture and one hour of discussion per week. A linguistic view of language and culture in the United States. The variety of languages spoken in our country and the issues surrounding them: language and ethnicity, politics of linguistic pluralism versus ideological monolingualism, language and education, language shift, loss, retention, and renewal. Languages include English (standard and nonstandard; Black English), pidgens and creoles, Native American languages, Spanish, French, and immigrant languages from Asia and Europe. This course satisfies the American culture requirement. (F, SP)

98. Directed Group Study. (1-5) Course may be repeated for credit. Must be taken on a passed/not passed basis. Group study of a topic not included in the regular department curriculum. (F, SP)
mantic domains (kinship, color, etc.), and contrastive lexicology: lexicalization pattern differences across languages.

H195. Special Study for Honors Candidates. (2-4) Course may be repeated for credit. Three hours of work per week per unit. Hours to be arranged. Prerequisites: 3.5 GPA or higher. (F,SP)

186. Directed Group 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)

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 first year in program. An introduction to linguistics as a profession, its history, subfields, and methodologies. (F)

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. Mandatory seminar 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 submittal as qualifying papers (and for journal publication), as well as to give students practical experience in the public presentation of their work.

C203. Cognitive Science and Social Inquiry. (3) Three hours of seminar per week. Prerequisites: 106, 105/Cognitive Science 101, or consent of instructor. An introductory seminar applying analytic techniques from cognitive science to issues in politics, law, anthropology, feminism, and other areas of the social sciences. Philosophically, cognitive science provides an empirical alternative to both objectivist and postmodern views.

205. Advanced Cognitive Linguistics. (3) Three hours of lecture per week. Prerequisites: 105 or consent of instructor. This will be an advanced course in cognitive linguistics. Among the topics covered will be cognitive bases for aspects of grammatical structure, cognitive constraints on language change and grammaticalization, and motivations for linguistic universal (i.e., constraints on variability).

210. Methods in Phonological Analysis. (3) Three hours of seminar per week. Prerequisites: 110. Field laboratory, and "pencil and paper" methods of analyzing phonological data from many languages. (SP) Ohala

211. Advanced Phonological Theory. (3) Three hours of seminar per week. Prerequisites: 111. Extensive readings and discussion of current issues in phonological theory.

212. Advanced Phonetics and Phonology. (3) Three hours of lecture per week. Prerequisites: 210. Advanced study of the anatomical, physiological, and acoustic basis of speech production and perception.

214. Language and Music. (3) Course may be repeated for credit. Three hours of seminar per week. A seminar of selected problems in the realm of language and music.

215. Advanced Morphology. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 110 or consent of instructor. Examination of problems in theoretical systems. Issues in the theory of word morphology.

220. Syntax and Semantics 1. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. This course has two main objectives. First, the course serves as an introduction to the study of syntax and semantics within the nonderivational constraint-based formal framework of Head-Driven Phrase Structure Grammar (HPSG). Second, we will explore a number of phenomena of natural language (morpho) syntax and semantics in a range of typologically diverse languages and from a variety of theoretical perspectives. Possible topics include argument structure, anaphora, auxiliaries and negation, phrase structure and non configurationality, long-distance dependencies, problems of quantification, tense and aspect, and mood and interrelated uses, clitics and the morphology-syntax interface. (F)

220B. Syntax and Semantics II. (3) Three hours of lecture per week. Prerequisites: 220. This course continues the survey of syntactic and semantic phenomena in languages. Most of the methods of their description begun in 220. (SP)

221. Transformational Grammar. (3) Three hours of lecture per week. Prerequisites: 120 or consent of instructor. Introduction to recent versions of transformational grammar. Topics include Universal Grammar, Syntactic structure and Language and Gender; Conventive, empty categories, case, -Teta-, X-, Binding theory, A- and A*- movement, head movement, functional heads, Logical Form and Minimalist Program.

230. Historical Linguistics. (3) Three hours of lecture per week. Prerequisites: 110 or consent of instructor. This is an introductory seminar of selected problems in the realm of language history. Course may be repeated for credit. Three hours of seminar per week. A

231. Historical Semantics. (3) Three hours of lecture per week. Prerequisites: 200. Synchronic variation and diachronic change in the realm of meaning.

235. History of Linguistics. (3) Course may be repeated for credit. Three hours of lecture per week. This course covers the period from ancient to 19th century. (2) Course may be repeated for credit. Three hours of lecture per week. This course covers the period from ancient to 19th century. (SP) Bopp, Rask, Humboldt, Schleicher, Whitney, Breal, Saussure, and Jespersen.

240A. Field Methods I. (3) Course may be repeated for credit. Four hours of session per week. Credit and grade to be awarded on completion of sequence. Prerequisites: 230. Introduction to field methods: "clinic" for first-time GSI's and "class" for returning graduate students in linguistics and related fields advanced training in current theories and methods in sociolinguistics. The course covers the following topics: Language Variation; Language and Gender; Conversation/Dialogue/Interview. Each field student is given an opportunity to work with a field adviser. Individual study for the comprehensive or language requirements in consultation with the field adviser. (F,SP)

250A-250D. Sociolinguistic Analysis. (3;3;3;3) Hours to be arranged. 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: One full year of graduate work at Berkeley or consent of graduate adviser. (F,SP)

251. Sociolinguistics. (3) Hours of lecture per week. Prerequisites: 230. An introduction to sociolinguistics. Topics include language contact; Language and Gender; Conventional & Nonconventional Discourse; Language and Gender; Conversation/Dialogue/Interview. Each field student is given an opportunity to work with a field adviser. Individual study for the comprehensive or language requirements in consultation with the field adviser. (F,SP)

258. Training for Linguistics Teaching Assistants. (2) This two 90-minute sections per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 110, 120 and 130 or consent of instructor. A teaching methods "clinic" for first-time Linguistics GSI's. Sessions will deal with the presentation of linguistic concepts in each of the foundation courses, the creation of homework assignments and examination, policies and practices regarding correction of students' work, grading, and feedback. (F,SP)

Professional Courses

301. Teaching Practice and Instruction. (2,4) Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 210 and 221. An analysis of the language structure of a particular language. The language investigated changes from year to year.

271. Linguistics of Southeast Asia. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 230. Deep analysis of Southeast Asian languages, including some of their major phonological, grammatical, and semantic characteristics. The emphasis is on the study of syntax and semantics within the non-
Logic and the Methodology of Science

(College of Letters and Science)

Group Office: 731 Evans Hall, (510) 642-2065
Chair: W. Hugh Woodin, Ph.D.

Professors
Robert M. Anderson, Ph.D. Nonstandard analysis
(Remarkers) (Emeritus)
Joseph Ben-Asher, Ph.D. Artificial intelligence, (Emeritus)
Martin Byers, Ph.D. Logic
Benson Mates, Ph.D. Philosophy of science, logical positivism, ethics, (Emeritus)

Lower Division. Mathematics 1A-1B, 53, 54; Chemistry 1A; Physics 7A-7B; Engineering 77, 28, 36, 45; Electrical Engineering and Computer Sciences 100. Electives must include 4 units of lower division physical science, engineering, mathematics, or statistics courses approved by the adviser.

Degree

Curriculum for the Bachelor’s Degree
A total of 120 units is required, including:
Six courses of at least 3 units each in humanities and social studies selected from an approved list of courses will be required. Of these, at least one course must be an English composition course taken from the current approved college list of courses (List E), one must be from a list of selected courses in History and Cultures, one must be from a list of selected courses in Literature and Values, and two must be upper division courses. The English composition course and either the course in History and Cultures or that in Literature and Values must be taken for a letter grade. A minimum of two courses, at least one of which is in the upper division, must be taken from a single department.

Four courses in philosophy, attention is especially directed to courses in the various departmental offerings, in statistics, and in linguistics.

Logic Colloquium (no credit). Reports on current research and scholarly work by members of the staff, visitors, and graduate students. Addison (F, SP)

Other Departments with Related Programs
Mathematics and Philosophy

Manufacturing Engineering
(College of Engineering)

Program Overview
Manufacturing Engineering is an interdisciplinary undergraduate program offered jointly by the Department of Industrial Engineering and Operations Research and the Department of Mechanical Engineering. The emphasis of the program is on how to manufacture products and includes quality assurance, machinery design, plant layout, employee supervision, and economic analysis. The program demands creativity and the ability to solve problems and communicate effectively.

Course topics include computer-aided manufacturing, robotics, and automated production systems, high mixture volume manufacturing, systems design and synthesis, reliability, optimization, and manufacturing processes. These fundamentals are applied to a variety of manufacturing industries, including integrated circuit, automobile, steel, and electronics.

Upper Division. Engineering 102, 120; Civil Engineering 130; Mechanical Engineering 101, 102A, 104, 105; Industrial Engineering and Operations Research 140, 150, 153, 165, and either 130 or 131; Mechanical Engineering 102B or Industrial Engineering and Operations Research 180; Statistics 134. Electives must include 2 courses from each of the following two groups: Group I: ME 110, 112, 123, 133, 134, 135; Group II: Industrial Engineering 115, 131, 161, 162, 166, 170. If Industrial Engineering 162 is elected, Industrial Engineering 160 should be substituted for Engineering 102.

Mass Communications
(College of Letters and Science)

Group Major Office: Division of Undergraduate and Interdisciplinary Studies, 201 Campbell, (510) 642-2363
http://ls.berkeley.edu/ugis/masscommunications

Faculty Advisory Committee
David Henkin (History)
Neil Henry (Journalism)
Peter Lyman (Information Management and Systems)
Jean P. Retzinger, Ph.D. (Mass Communications)
Mark Sandberg (Scandinavian)
Laura Stoker (Political Science)

Faculty Adviser: Ms. Retzinger.

Student Affairs Officer: Mr. Gaetjens.

Group Major in Mass Communications

The group major in mass communications is administered by the Division of Undergraduate and Interdisciplinary Studies. It applies a range of disciplines in the social sciences and humanities to the understanding of contemporary mass media, their structure, history, content, consequences, and policy implications. The emphasis in the Berkeley program is not on media production, but, rather, on the central role that media play in modern society, with special emphasis on political and cultural life.

Declaring the Major
Students planning to declare a major in mass communications are advised to contact the student affairs officer as early as possible in planning their academic programs. Applications are accepted during designated advising hours in the fourth through the fifteenth week of each term.

Students who wish to declare the major in mass communications:
(1) must have completed at least 30 units of college course work before applying to the program;
(2) must have completed at least three of the major prerequisites, including Mass Communications 10;
(3) must be currently enrolled in any remaining prerequisite at the time of application (see list of approved major prerequisites below);
(4) must have a minimum GPA of 3.2 in courses relevant to the major; this includes the lower division prerequisite courses and the equivalency of transferred course work;
(5) should declare the major no later than the semester in which they complete the 70th unit. (Junior transfer students should contact the major adviser for Mass Communications concerning their eligibility and the equivalency of transferred course work.)

Students who meet the above criteria are eligible for admission to the major. Students who do not meet the above criteria but wish to declare mass communications should submit a letter of appeal along with a completed application.
Applications and instructions regarding the admission and appeal process may be obtained from the Mass Communications Office in 343 Campbell Hall.

Transfer Students
Transfer students may complete Mass Communications 10 at Berkeley, but are urged to complete other major prerequisite courses before arriving on campus. New transfers should see the major advisor on arrival in order to have transfer prerequisites approved. Transfers may need assistance in adding Mass Communications 10 to their schedules.

Major Program
Prerequisites. One course from each of the following four groups. All prerequisites must be taken for a letter grade.
- History 7B, 124A, 124B or 131B;
- Political Science 1;
- Anthropology 3, Economics 1, Psychology 1 or 2, Sociology 1 or 3;
- Mass Communications 10.

Requirements for Graduation
(These requirements are in addition to the prerequisites for admission to the major.)
At least 30 upper division units distributed over the following three areas:
A. The following three core courses in mass communications: Mass Communications 101, 102, and 104.
B. One of the following methods courses: Anthropology 190A; Mass Communications 130; Political Science 3 or 12A-12B; Psychology 101; Sociology 5 or 105.
C. Five courses from the following list: Anthropology 144, 149, 156B, 165, 166; Business Administration 160, 165; English 173, 176; Journalism 140, 141, 163, 180; Linguistics 150; Mass Communications 160, 170, 180, 190; Political Science 161, 162, 164A, 164B, 168A-168B; Psychology 123, 124, 160, 162, 165; Sociology 110, 140, 150, 156, 160, 170.
All requirements for graduation in the major must be taken for a letter grade.

Any substitutions must be approved by the major advisor.

Honor Program
To be admitted to the honors program, a student must have attained at least a 3.5 grade-point average in the major. In order to be granted honors, a student must write a thesis in which the judgment of the thesis director and the advisor is characterized by superior distinction (Mass Communications H195).

Lower Division Courses
10. Mass Communications in America: An Introduction. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: Sophomore standing or permission of the instructor. An introduction to the history, functions, and control of mass communication institutions in the United States, and to media content and effects. (F) Leonard

Upper Division Courses
101. The Structure of Mass Communications. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 10, or consent of instructor. Analysis of contemporary structures of mass communications, primarily in capitalist societies, with historical background on the popular press, radio, and television. The organization of news and entertainment. Comparison with other societies. (SP) Leonard

102. The Effects of the Mass Media. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 10 or consent of instructor. Survey and critical analysis of theory and research on the effects of mass media and exposure and media messages. (F) Retzer

C104. The First Amendment and the Press. (3) Three hours of lecture/discussion/field work per week. The course considers the philosophico-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, and fair trial/free press, news gathering and access to information. (F) Staff

130. Mass Communications Research and Methods. (3) Three hours of lecture per week. Prerequisites: 10 or consent of instructor. A review of primary research methods used in the field of mass communications: quantitative and qualitative methods, including survey research, content analysis, ethnographic and textual approaches. May be oriented around research on a special issue. Topic for spring 1996: Violence in the media. (SP) Retzer

160. International Media. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 10 or consent of instructor. Case studies of the foreign media. Focus may be on the press, broadcasting, documentaries, or new media. Possible topics: Pacific Rim press; mass media in China; Israeli and Palestinian media. Staff

170. Cultural History of Advertising. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 10 or consent of instructor. Introduction to 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. (SP) Retzer

180. Topics in Television. (4) Course may be repeated for credit as topic varies. Four hours of lecture per week. Prerequisites: 10 or consent of instructor. This course explores, through 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 individual television texts. Staff

190. Special Topics in Mass Communications. (2-4) Course may be repeated for credit. Two to four hours of seminar per week. Prerequisites: Consent of instructor. Normally only open 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. Staff

H195. Honors Colloquium. (3) Three hours of seminars per week. Prerequisites: Open only to seniors in the group major in Mass Communications. 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) Retzer

C196W. Special Field Research. (10.5) Course may be repeated for a maximum of 12 units. 240-300 hours work per semester plus regular meetings with the facility supervisor. Prerequisites: Consent of instructor. Formerly 196W. 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 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 produce a final paper for the semester of no fewer than 35 pages. Other restrictions apply; see faculty adviser. Also listed as History of Art C196W, Undergrad Interdisciplinary Studies C196W, Women’s Studies C196W, Political Science C196W, History C196W, Political Economy of Industrial Socioculture C196W, and Sociological Economy C196W.

198. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Must be taken on a pass/no pass basis. Prerequisites: Regulations set by College of Letters and Science. Seminars for the study of selected topics not covered by regularly scheduled courses. Topics will vary from year to year. (F,SP) Staff

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 pass/no pass basis. Independent study and research by arrangement with faculty. (F,SP) Staff

Materials Science and Engineering
(Graduate Program and Undergraduate Program)

Department Office: 577 Evans Hall #1760, (510) 642-3801
http://www.mse.berkeley.edu
Chair: Thomas A. Devine, Jr., Ph.D.
Professors
A. Paul Alivisatos, Ph.D. University of California, Berkeley.
Physical Chemistry
George H. Brimhall, Jr., Ph.D. University of California, Berkeley.
Economic geology
Lagarde Dubonoge, Ph.D. University of California, Berkeley.
Ceramic properties and processing
Thomas M. Devine, Jr., Ph.D. Massachusetts Institute of Technology, Corrosion, liquid-solid interface
Fiona M. Doyle (Donald H. Pashley Professor of Mineral Engineering), Ph.D. Imperial College, University of London, Hydrometallurgy
J. W. Evans, Ph.D. State University of New York.
Extractive and process metallurgy
Douglas W. Fuerstenau (Kip and Phyllis Oppenheimer Professor in Advanced Materials Analysis), Ph.D. University of California, Berkeley.
Materials characterization
Eugene E. Haller, Ph.D. University of Basel. Electronic materials
† J. W. Marks, Jr., Ph.D. Massachusetts Institute of Technology. Microstructural development, ceramic joining
Ronald Grossnick (Arthur C. and Phyllis G. Oppenheimer Professor in Advanced Materials Analysis), Ph.D. University of California, Berkeley.
Materials characterization
Gareth Thomas, Ph.D. Cambridge University.
Mineralogy
Didier de Fontaine, Ph.D. Massachusetts Institute of Technology.
Mineral processing
T. N. Narasimham, Ph.D. University of California, Berkeley.
Hydrogeology
Robert C. Ritchie, Ph.D. University of Cambridge.
Toughness and failure of metals
Timothy O. Sands, Ph.D. University of California, Berkeley.
Thin films
K. N. V. Saxty, Ph.D. University of California, Berkeley.
Mineral processing, particulate materials
Gareth Thomas, Ph.D. Cambridge University.
Materials characterization
Eike R. WEBER, Ph.D. University of Cologne. Electronic materials
Robert H. Bragg, Ph.D. (Emeritus)
Didier de Fontaine, Ph.D. (Emeritus)
Marshall F. Meriand, Ph.D. (Emeritus)
Joseph A. Paaz, Ph.D. (Emeritus)
Alan W. Steacy, Ph.D. (Emeritus)
Jack Washburn, Ph.D. (Emeritus)
Paul A. Williams, Ph.D. (Emeritus)
Victor F. Zaccay, Ph.D. (Emeritus)

Associate Professors
Daryl Chran, Ph.D. University of California, Berkeley.
Computational materials science
Kevin E. Healy, Ph.D. University of Pennsylvania.
Biomaterials and tissue engineering
Assistant Professor
Oscar D. Dubin, Ph.D. University of California, Berkeley.
Electronic materials processing

Department Overview
The Department of Materials Science and Engineering administers undergraduate programs in materials science. In addition, students may be admitted to one of several double major programs. Graduate programs are offered in materials science and mineral engineering.

Materials Science and Engineering deals with natural and man-made materials—their extraction, development, and characterization for use particularly in advanced applications such as solid-state electronics, atomic energy, and aerospace industries.
Electrical and Computer Engineering.

Required: Mathematics 1A-1B, 4C, or Physics 7A-7B-7C.

Elective from the Materials Science and Engineering 100, 102, 103, 104, 111, 112, 113, 130A; Physics 7C and Mathematics 53 or 54 may be taken to fulfill the upper division technical elective requirement.

Graduate Study

Materials Science and Engineering

Qualified holders of the bachelor's degree in fields such as ceramic engineering, metallurgy, physics, materials science, chemistry, and various fields of engineering can all successfully undertake graduate study in materials science.

The graduate program emphasizes research. Techniques such as transmission electron microscopy, optical spectroscopy, electron paramagnetic resonance, electrical transport, microprobe X-ray emission spectroscopy, differential thermal analysis, precision calorimetry and cryogenic and high temperature mechanical testing are used for fundamental characterization of materials. Research from a single depth study, such as the mechanical, chemical, surface, thermodynamic, electrical, and magnetic properties of ceramics, metals and semiconductors and study of the kinetics, thermodynamic, and simulation of the processes by which materials are produced.

Extraneous Metallurgy/Metallurgical Processing

Holders of a bachelor's degree in metallurgy, mineral engineering, or a related field in materials science or engineering who wish to pursue an advanced degree in metallurgy or chemistry would find this program of interest. Several introductory and advanced-level courses on the processing and extraction of ores and solid fuels are available. These include studies of phase transformations, thermodynamic and kinetic phenomena, fluid flow and transport. Treatments are both analytical and numerical and involve extensive use of computer simulation. Research concerns the thermodynamic and kinetic phenomena which are fundamental to these processes as well as the computer simulation, control and scale-up of these operations.

A combination of course work and research normally leads to the Ph.D. or D.Eng. degree, qualifying the graduate for positions in industry, government organizations or universities that entail research in the production of metals, other materials or fuels.

Lower Division Courses

24. Freshman Seminar. (1) One hour of lecture/discussion per week. Must be taken on a passed/not passed basis. Overview of the planet on which we live, taught by faculty and guests. Includes discussion of the origins of natural materials, both fuels and non-fuel minerals, the materials cycle that produces the commodities used by society from structural steel to semiconductors. Use of materials in high technology. Environmental aspects of energy and materials production. (SP) Devine

Upper Division Courses

100. Field Trips. (1) Four hours of field trip per week. Prerequisites: Junior standing in materials science or consent of instructor. Visits to factories and industrial organizations or universities) Diffraction, imaging, and spectroscopy of electronic products, with emphasis on the materials aspects. Lectures by engineers and managers from materials industries. Written trip reports. (F) Staff

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 crystallography; chemical aspects of engineering materials; relationship to physical and mechanical properties. (F) Staff

103. Phase Transformations and Kinetics. (3) Three hours of lecture per week. Prerequisites: 101 and 102. 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. Martensite transformation. Surface analysis. Measurement of mechanical and physical properties. Project laboratory focusing on mechanical, chemical, electrical, and magnetic properties of materials, and materials characterization. Field trips. (SP) Staff

111. Properties of Electronic Materials. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Physics 7A-7B-7C or Physics 7A-7B and consent of instructor. Investigation of the physical principles underlying the electric properties of modern solids with emphasis on semiconductors; 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 lasers) and optical fibers; properties of metal and oxide superconductors and their applications. (SP) Haller

112. Corrosion (Chemical Properties). (3) Three hours of lecture per week. Prerequisites: Physics 7A-7B-7C or Physics 7A-7B and consent of instructor. Investigation of the physical principles underlying the electric properties of modern solids with emphasis on semiconductors; 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 lasers) and optical fibers; properties of metal and oxide superconductors and their applications. (SP) Haller


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metals, ceramics, and composites. Life prediction and damage-tolerant design. Case studies of engineering failures. (F) Ritchie

114. Extraneous Corrosion Science and Engineering. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 112 (may be taken concurrently). Energy-assisted corrosion of alloys. Inhibitors, atmospheric corrosion, and control of corrosion phenomena using electrochemical techniques. (SP) Devine

115. Phase Diagrams. (2) Two hours of lecture per week. Prerequisites: Engineering 115 or an equivalent thermodynamics course or consent of instructor. Phase diagrams for one-, two-, and three-component systems. Fundamental thermodynamic relationships relevant to phase equilibrium. Relationships between solution behavior, free energy curves, and phase diagrams. (SP) Glaser

116. Physical Science of Structural Materials. (3) Three hours of lecture per week. Prerequisites: 102, 103, Engineering 45. The physical metallurgy and materials science of the major classes of structural materials, namely metallic alloys (e.g., steels, Ni-base al- loys, Cu-base alloys), ceramic materials (e.g., Al2O3, SiC, glass), and composites (e.g., TiAl6V4, Nicalon, and their composites). (SP) Ritchie

117. Properties of Dielectric and Magnetic Materials. (3) Three hours of lecture per week. Prerequisites: Physics 7A-7B-7C or Physics 7A-7B and consent of instructor. Introduction to the physical principles underlying the dielectric and magnetic properties of solids. Processing-microstructure-property relationships of dielectric materials, including piezoelectric, pyroelectric, and ferroelectric oxides, and of magnetic materials, including hard- and soft ferromagnets, ferrites and magneto-optic and magnetic nanomaterials. The course also covers the properties of grain boundary devices (including varistors) as well as ion-conducting and mixed conducting materials for applications in various devices such as sensor, fuel cells, and electric batteries. (F) De Jonghe, Saha

C118. Biological Performance of Materials. (3) Three hours of lecture per week. Prerequisites: Engineering 45. Biology 1A-1B (may be taken concurrently). Introduction to the problems associated with the biological effects of biomaterials. (F) Healy

120. Materials Production. (3) Three hours of lecture per week. Significance of materials. Occurrence of raw materials. Recovery of metals and engineering principles relevant to materials production and processing. Methods for production of major materials. (F) Evans

121. Metals Processing. (3) Three hours of lecture per week. Prerequisites: Engineering 45. The principles of metals processing with emphasis on the use of processing to establish microstructures which impart desirable engineering properties. The techniques discussed include solidification, thermal and mechanical processes, powder processing, welding and joining, and surface treatments. (F) Staff

122. Ceramic Processing. (3) Three hours of lecture per week. Prerequisites: 101 and Engineering 45. Powder fabrication by grinding and chemical methods, rheological behavior of powder-fluid suspensions, forming methods, drying, sintering and grain growth. Re- lation of processing steps to microstructure development. (F) Glaser

123. Semiconductor Processing. (3) Two hours of lecture and one hour of discussion per week. Prere- quisites: 111 or Physics 7A-7B and consent of instructor. Semiconductor purification and crystal growth techniques; crystal purity by diffusion, ion implantation and alloy regrowth; contact formation, mechanical and chemical processing; semiconductor analysis. (F) Weber

124. Glass and Crystalline Ceramic Materials. (3) Three hours of lecture per week. Prerequisites: 101 and Engineering 45. Preparation of nonelectrolyte ceramics, conditions for glass formation, atomic structur- e of glasses, phase separation mechanisms. Mechanical properties of glass, strengthening mechanisms, and applications of glasses and glassy powder fabrication of crystalline ceramics. Mechanical behavior of crystalline ceramics relevant to structural applications. Ceramics for optical, magnetic, and electro- mechanical applications with emphasis on microstructure-property relationships. (F) DeVon, Glaser

125. Thin-Film Materials Science. (3) Three hours of lecture per week. Prerequisites: Upper division or grad- uate standing in engineering, physics, chemistry, and chemical engineering; Engineering 45 required; 111 or Physics 141 or Electromagnetic. Properties, synthesis, and characterization of thin films and their technological applications. Physical and chemical vapor deposition methods. Thin-film nucleation and growth. Ther- mal and ion-beam structural development in epitaxial, polycrystalline, and amorphous films. Thin- film characterization techniques. Applications in information storage, integrated circuits, and optoelec- tronic device fabrication. (SP) Svetlik

130A. Experimental Materials Science. (3) One and one-half hours of lecture and four and one-half hours of laboratory per week. Prerequisites: 102, 103, 111, 112, 113 may be taken concurrently; Engineering 45. The processing and properties of materials will be ex- perimentally investigated. A variety of tools avail- able to materials scientists and engineers. Experiments will investigate the mechanical, electrical, and electro- chemical properties of metals, ceramics, semicon- ductors, and composites. Electrochemical and thin-film techniques will be employed for processing of mate- rials. (F) Devine

C131. Microfabrication Equipment Laboratory. (2) One hour of lecture and three hours of laboratory per week. Prerequisites: Electrical Engineering 40 or 100, Mathematics 53 and 54, Physics 7B; an upper division course on microfabrication technology or manufactur- ing is recommended but not required (e.g., Chem- ical Engineering 117, Mechanical Engineering 143, Mechanical Engineering 101, 122, 121, 112, 123, 125). Experiments and simulations illustrating the fundamental principles of equipment and measurement technology for microelectronic and microelectrome- chanical fabrication and manufacturing. The exper- iments involve investigation and measurements of high vacuum systems, plasma-assisted etching and film de- position, high temperature silicon oxidation, photo- lithography, spin coating, chemical-mechanical pol- ishing, and electroplating. Also listed as Mechanical Engineering C123, Electrical Engineering C133, and Chemical Engineering C133. (SP)

160. Processing of Minerals and Wastes. (3) Three hours of lecture per week. Prerequisites: Chemical Engineering 102, 103 or equivalent. Formerly Mineral En- gineering 190 and 191. A number of field visits to earth resources engineering operations. Trips typically include petroleum engineering operations, extractive metallurgy operations, environmental remediation sites, and a geothermal energy plant. Written trip reports. No final examination. (SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for a maximum of four units per sem- ester. Individual conferences. Must be taken on a letter grade basis. Formerly Engineering and En- gineering 199 and 191. A number of field visits to earth resources engineering operations. Trips typically include petroleum engineering operations, extractive metallurgy operations, environmental remediation sites, and a geothermal energy plant. Written trip reports. No final examination. (SP) Staff

Graduate Courses

200A. Survey of Materials Science. (4) Four hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. A survey of Materials Science and Engineering graduate courses. Formerly 112/113. (F) Staff

201A-201B. Thermodynamics and Phase Transform- ations in Solids. (4,4) Four hours of lecture per week. Prerequisites: 101, 102, 103 or equivalent. 201A is a prerequisite to 201B. The laws of thermodynamics, fundamental equation for multicomponent elastic behavior and electromagnetic criteria. (F) Staff

202. Crystal Structure and Bonding. (3) Three hours of lecture per week. Regular, irregular arrays of points, spheres, lattices, direct, reciprocal; crystallo- graphic point and space groups; atomic structure; chemical bonding of molecules; bonding in solids; Ionic (Pauling rules), covalent, metallic bonding; structure of elem- ents, compounds, minerals, polymers. (SP) Staff

204. Theory of Electron Microscopy and X-Ray Diffraction. (3) Three hours of lecture per week. Prere- quisites: Physics 7C or consent of instructor. Theoretical principles and techniques used in the characterization of engineering materials by electron microscopy, diffraction, and spec- troscopy; emphasis on detailed analysis of defects re- sponsible for material failure. (F) Glaeser, Kittles

250. Defects in Solids. (3) Three hours of lecture per week. Prerequisites: Physics 7C or consent of in- structor. Many properties of solid state materials are determined by lattice defects. This course treats in de- tail the structure of crystal defects, defect formation
and amorphous processes, and the influence of lattice defects on the physical and optical properties of crystalline materials. (F) Weber

C211. Mechanics of Solids. (3) Students will receive no credit for 231 after taking Civil Engineering 231A or 231B prior to Fall 1992. Three hours of lecture per week. Prerequisites: Consent of instructor. Overview of mechanical response of materials: Simple tension in elastic, plastic and viscoelastic members. Continuum mechanics: The stress and strain tensors, equilibrium equations, three-dimensional elastic-plastic and viscoelastic problems. Thermal, transformation, and deformational stress states. Applications: Plane problems, stress concentrations at defects, metal forming problems. Also listed as Civil and Environmental Engineering C231. (F) Govindjee

C212. Deformation and Fracture of Engineering Materials. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Civil Engineering 130. Engineering materials: deformation and fracture behavior of engineering materials for both monotonic and cyclic loading conditions. Also listed as Mechanical Engineering C225. (SP) Pruitt, Ritchie

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. Devine

C214. Microstructured Materials. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Thermomechanical behavior of inhomogeneous materials (polycrystals, composites, porous and damaged media) and structures. The homogenization and the microstructured continua approaches. Effect of phase boundaries on the mechanical response in the structural response of thin films and miniaturized mechanical devices. Also listed as Civil and Environmental Engineering C236. (F) Li

215. Computational Materials Science. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: Graduate standing in engineering or sciences, or consent of instructor. Introduction to computational materials science. Development of atomistic 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 deformation, melting, and defect properties. Introduction to simple numerical methods for solving coupled differential equations and for studying correlations. (SP) Chizhov

218. Biomedical Microdevices. (3) Offered as Engineering 291B Fall 1996. Three hours of lecture per week. Prerequisites: Consent of instructor. Overview of Micro-Electro-Mechanical Systems for biomedical applications (BioMEMS). Fundamentals of microfabrication science and technology. Interactions of biological surfaces. Interactions with biopolymers, biosensors, microelectrodeelectrochemical and PCR equipment, particle nanofilters, microfabricated capsules for the immunosorption of cell transplants, tissue engineering, and drug delivery. (F) Staff

C219. Diffusion: History, Physics, and Mathematics. (3) Three hours of lecture per week. Prerequisites: Graduate standing in the sciences or engineering; consent of instructor. Formerly C200. Fourier’s heat-diffusion model as a basis for studying diverse physical, biological, geological, and social systems. Basic concepts and equations of diffusion, observational justification and solution methods. Evolution of ideas as revealed by history of historical significance. Heat, chemical, solid and gas diffusion, flow in porous media, and stochastic differential equations. Students to explore their individual interests in diffusion (experimental, theoretical, or bibliographical) in a broader scientific context. Also listed as Engineering C219. (SP) Narasimhan

220. Rate Phenomena in the Synthesis and Processing of Materials. (3) Three hours of lecture per week. Prerequisites: Graduate standing in Engineering. Fluid mechanics, heat and mass transport, and chemical reaction kinetics relevant to the synthesis and processing of metals, ceramics, electronic materials and composites. (SP) Evans

222. Sub-Micron Powder Synthesis and Processing. (3) Three hours of lecture per week. Prerequisites: 103 or Engineering 115 or consent of instructor. Formerly 246 and 248. Synthesis by chemical and physical methods of sub-micron powders. Introduction to surface and colloid chemistry; implications to consolidation and formation of dense films and macro-parts. Evolution of nanoscale microstructures during densification, and methods for controlling the structure. (SP) De Jonghe, Glaseer

223. Semiconductor Materials. (3) Three hours of lecture per week. Prerequisites: Physics 7C or consent of instructor. Semiconductor purification and crystal growth techniques. Doping, radiation damage, and annealing. Metal-semiconductor interfaces and reactions. Interaction between defects and impurities during processing. (F) Haller

C225. Thin-Film Science and Technology. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering, physics, chemistry, or chemical engineering. Thin-film nucleation and growth, microstructural evolution and reactions. Comparison of thin-film deposition techniques. Characterization techniques of thin-films by ion implantation and rapid annealing. Processing-microstructure-property-performance relations. Introduction to the role of nanoparticles as in information storage, ICs, micro-electromechanical systems and optoelectronics. Also listed as Applied Science and Technology C225. (SP) Cheung, Sands

241. Electron Microscopy Laboratory. (2) Six hours of laboratory per week. Prerequisites: 204 or 205 or consent of instructor. Two and one-half hours of laboratory per week. Prerequisites: 204 or 205 or consent of instructor. Formerly 204 and 205. Selection of advanced materials science problems. (SP) Gronsby

242. Advanced Characterization Techniques. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 204 or 205 or consent of instructor. Formerly 204 and 205. Selection of advanced materials science problems. (SP) Gronsby

260. Surface Properties of Materials. (3) Two and one-half 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. (F) Weber

263. Surface Science of Colloids and Flocculation. Three hours of lecture per week for three consecutive five-week blocks per semester. Prerequisites: 263A is a prerequisite to 263B and 263C. Formerly Mineral Engineering 263. (SP) Doyle

263A. (1) Physical chemistry of colloids and minerals in aqueous media. (F)SP

263B. (1) Applied colloidal phenomena; flocculation, coagulation, stabilization, and dispersion. (SP)

263C. (1) Natural floatability of minerals, selective adsorption of surfactants, flotation of minerals, ions, precipitates, oil droplets, etc. (SP)

265. Modeling of Particulate Rate Processes. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering. Formerly Mineral Engineering 265. Fundamental principles of process modeling, introduction to particulate systems in mineral, metallurgical, chemical, and ceramic industries: quantitative description of particulate systems; transport through reactors; development of population balance models and analysis of rate processes involving particulate size changes, solid-liquid and solid-liquid separations, and fluid-solid reactions. (F) Sastry

270. Advanced Hydrometallurgy. (3) Three hours of lecture per week. Formerly Mineral Engineering 270. Principles of hydrometallurgical processing of mineral ores and concentrates; fundamentals of leaching, precipitation, and mechanisms of hydrometallurgical reactions. Analysis of methods for the recovery of metals from leach liquors. (F) Doyle

290G. Phase Diagrams in Materials Science and Technology. (2) One hour of lecture per week. Prerequisites: Engineering 115 or an equivalent thermodynamics course or consent of instructor. The use of phase diagrams in technological applications. Fundamental thermodynamic relationships relevant to phase equilibrium. Relationships between solution behavior, free energy curves, and phases diagrams. Phase diagrams for two-component and three-component systems. (SP) Glasser

290M. Special Problems in Materials Science. (3) Three hours of lecture per week. Prerequisites: 201A-201B or consent of instructor. Selected topics in the thermodynamic, kinetic or phase transformation behavior of solid materials. Topics will generally be selected based on student interest in Mat Sci 201A-201B. The course provides an opportunity to explore subjects of particular interest in greater depth. (SP) Morris

298. Group Studies, Seminars, or Group Research. (1-8) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in engineering. Individual study in various subjects through special seminars on topics to be selected each year, informal group studies of special problems, group participation in conferences or on complete problems for analysis and experimentation. (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. Individual study for the comprehensive or language requirements in consultation with the field advisor. (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. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in engineering. 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. (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. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in engineering. 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. (and other doctoral degrees). (F,SP) Staff
The Majors Program

The department offers undergraduate major programs 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. More detailed information is given in the "Handbook" which is available from the undergraduate advising office in 965 Evans Hall and at [http://www.math.berkeley.edu/undergrad/annoucement.html](http://www.math.berkeley.edu/undergrad/annoucement.html).

Two additional opportunities offered by the Department of Mathematics are the TeachMath Program and Undergraduate Research Seminars.

TeachMath: Mathematics majors who are interested in obtaining a teaching credential are encouraged to apply to the TeachMath Program. This two-year program provides students $4,000 when they begin the program in their senior year, and $8,000 toward an additional year, resulting in both a B.A. degree and credential. Interested students should apply during their junior year. For further details, see the undergraduate advisor in 965 Evans Hall.

Undergraduate Research Seminar: Math 191 is intended to initiate undergraduate research into the research activities of ladder rank faculty members. This course can be taken for credit by participating in a small undergraduate or advanced seminar led by a ladder rank faculty member, and topics vary each semester. Students choose between enrolling in 1 unit and receiving a $1,000 scholarship for successful completion of the course or enrolling in the full 3 units of course and receiving no stipend.

General Major Requirements. Both major programs require a lower-division base of Mathematics 1A-1B and 53 and Courses 16A-16B and not an acceptable alternative. Math 1A-1B must be completed with average grades of C or better; Math 53 and 54 must be completed with minimum grades of C in each. Transfer students should contact the undergraduate advisor in 965 Evans Hall about requirements for admission to the major. Eight upper-division courses are required for either major. Specific course requirements follow.

Major in Mathematics. (a) Four core courses 104, 110, 113 and 185; (b) two semi-electives: select one course from each column from the three subject areas: I. Computing (128A); II. Geometry (130, 140, 142); III. Logic and foundations (125A, 135); (c) Two upper division math electives. With the approval of the major adviser, students may count courses that are taken for credit in computer science, statistics, physics, astronomy, mathematical economics, or other sciences toward requirements for the major in mathematics.

Major in Applied Mathematics. (a) 104, 110, 113, 185A, and 185B; (b) Three additional upper division courses, approved by a major adviser, which form a coherent cluster in some applied area such as actuarial science, biophysics, classical mechanics, computer science, decision theory, economics, fluid mechanics, geophysics, mathematical biology, numerical analysis, operations research, probability theory, quantum mechanics, 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 desiring honors must (a) earn a grade-point average of at least 3.5 in upper division and graduate courses in the major and at least 3.3 in all courses taken at the University; (b) complete the coursework in 185B in which they write a senior honors thesis, or pass two graduate mathematics courses with a grade of at least A-; (c) receive the recommendation of their major adviser. Students interested in the honors program should

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consult with their major adviser early in their program.

The Minor Program
Students in the College of Letters and Science may complete 9 units of the minor of their choice, normally in a field both academically and administratively distinct from their major. The minor program in the Department of Mathematics consists of the following course work:

Prerequisites: Mathematics 1A-1B and 53 and 54 (or their equivalents). These courses must be taken at 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 must be passed with an average of 2.0. The minor program in mathematics is designed to provide students with the opportunity to explore intellectual and practical experiences beyond their major.

For more information about this program, please contact the undergraduate adviser in 965 Evans Hall.

Preparation for Graduate Study
Students preparing for the Ph.D. in mathematics are strongly advised to acquire a reading knowledge of two foreign languages from among French, German, and Russian. Undergraduate students also often take one or more of the following introductory graduate courses: 202A-202B, 214, 225A-225B, 228A-228B, 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 instructions, and degrees and degree requirements is given in the Graduate Announcement of the Department of Mathematics, which is available upon request from the graduate assistant, Department of Mathematics.

Courses and Seminars
Courses and seminars are listed below. More detailed and up-to-the-minute information on seminars, textbooks, course outlines, and seminar content, teaching and grading methods, and schedules are posted on the ninth floor of Evans Hall and are available on the Web at http://www.math.berkeley.edu.

Lower Division Courses
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 1B but have not met the prerequisites.

1A. Calculus. (4) Students will receive no credit for 1A after taking 16B 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/workshop or computer laboratory per week. Prerequisites: Three and one-half years of high school math, including trigonometry and analytic geometry, 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 mathematics department for details. Students with AP credit should consider choosing a course more 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, with applications and an introduction to transcendental functions. (F,SP)

1AM. Calculus with Computers. (4) Students will receive no credit for 1AM after taking 1A or 16B; 2 units after taking 16A. Three hours of lecture and three hours of discussion/microcomputer laboratory per week. Prerequisites: Three and one-half years of high school math, including trigonometry and analytic geometry, 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 mathematics department for details. Students with AP credit should consider choosing a course more advanced than 1AM. This sequence is intended for majors in engineering and science. 1AM will cover the same topics as 1A; introduction to differential and integral calculus of functions with one variable, with applications and an introduction to transcendental functions. No prior computer experience is necessary. (F,SP)

1B. Calculus. (4) Students will receive 2 units of credit for 1B after taking 16B. 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 or 1AM. This course will cover the same topics as 1B: techniques of integration; applications of integration, infinite sequences and series, first-order ordinary differential equations. Second-order ordinary differential equations; oscillation and damping; series solutions of ordinary differential equations. No prior computer experience is necessary. (F,SP)

1BM. Calculus with Computers. (4) Students will receive 2 units of credit for 1BM after taking 16B. Three hours of lecture and three hours of discussion/microcomputer laboratory per week. Prerequisites: 1A or 1AM. This course will cover the same topics as 1B: techniques of integration; applications of integration, infinite sequences and series, first-order ordinary differential equations; second-order ordinary differential equations; oscillation and damping; series solutions of ordinary differential equations. No prior computer experience is necessary. (F,SP)

1B. Honors Calculus. (4) Students will receive 2 units of credit for 1B after taking 16B. 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 1B. Continuation of 1A. Techniques of integration; applications of integration, infinite sequences and series, first-order ordinary differential equations; second-order ordinary differential equations; oscillation and damping; series solutions of ordinary differential equations. No prior computer experience is necessary. (F,SP)

16A. Analytic Geometry and Calculus. (3) Students will receive no credit for 16A after taking 1A. Two hours of lecture and one hour of discussion/workshop per week; at the discretion of the instructor, an additional hour of lecture or discussion/workshop per week. Prerequisites: 3 years of high school math, including trigonometry, plus a satisfactory grade in one of the following: CEEB MAT test, an AP test, the UC/CSU math diagnostic exam, or 32. Consult the mathematics department for details. This sequence is intended for majors in the life and social sciences. Calculus of one variable; derivatives, definite integrals and applications, maxima and minima, and applications of the exponential and logarithmic functions. (F,SP)

16B. Analytic Geometry and Calculus. (3) Students will receive no credit for 16B after 1A. Two hours of lecture and one hour of discussion/workshop per week; at the discretion of the instructor, an additional hour of lecture or discussion/workshop per week. Prerequisites: 16A. Continuation of 16A. Application of integration of economics and life sciences. Differential equations. Functions of many variables. Partial derivatives, constrained and unconstrained optimization. (F,SP)

18M. Calculus with Computers. (4) Students will receive no credit for 18M after taking 1A-1B or 16A-16B and will receive 3 units after taking 18M. Three hours of lecture and one hour of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop or computer laboratory per week. Prerequisites: 18M and 1AM. Honors version of 18M. Parametric equations and polar coordinates. Vectors in 2- and 3-dimensional Euclidean spaces. Partial derivatives. Multiple integrals. Vector calculus. Theorems of Green, Gauss, and Stokes. (F,SP)

53M. Multivariable Calculus with Computers. (4) Students will receive no credit for 53M after taking 53A and 53B. 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: 53A and 53B. This course will cover the same topics as 53: parametric equations and polar coordinates, vectors in 2- and 3-dimensional Euclidean spaces; partial derivatives, multiple integrals; vector calculus. Theorems of Green, Gauss, and Stokes. No prior computer experience is necessary. (F,SP)

54. Linear Algebra and Differential Equations. (4) Students will receive 1 unit of credit for 54 after taking 50A and 50B and 3 units of credit after taking Math 50A. Three hours of lecture and three hours of discussion/microcomputer laboratory per week. Prerequisites: 1B or 16B. This course will cover the same topics as 54: linear algebra and differential equations. Vectors, matrices, and linear transformations. Systems of linear equations. Eigenvalues and eigenvectors. Vector calculus. Theorems of Green, Gauss, and Stokes. (F,SP)
spaces; inner product as spaces. Eigenvalues and eigenvectors; linear transformations. Homogeneous ordinary differential equations; first-order differential equations with constant coefficients. Fourier series and partial differential equations. (F,SP)

H54. Honors Linear Algebra and Differential Equations. (4) 3 units after taking 50A and 3 units after 50B. 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 54. Basic linear algebra: matrix arithmetic and determinants. Vectors spaces; inner product spaces. Eigenvalues and eigenvectors; linear transformations. Homogeneous ordinary differential equations; first-order differential equations with constant coefficients. Fourier series and partial differential equations. (F,SP)

54M. Linear Algebra and Differential Equations with Computers. (4) Students will receive no credit for 54M after taking 54. 1 unit after 50A, and 3 units after 50B. Three hours of lecture and three hours of discussion/microcomputer laboratory per week. Prerequisites: 1B. Honors version of 54. Basic linear algebra: matrix arithmetic and determinants. Vectors spaces; inner product spaces. Eigenvalues and eigenvectors; linear transformations. Homogeneous ordinary differential equations; first-order differential equations with constant coefficients. Fourier series and partial differential equations. No prior computer experience is necessary. (F,SP)

55. Discrete Mathematics. (3) Four 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: Mathematical maturity appropriate to a sophomore math class. 1A-B recommended. Logic, mathematical induction sets, relations, and functions. Introduction to graphs, elementary number theory, combinatorics, algebraic structures, discrete probability, theory, and statistics. Emphasis on topics of interest to students in the physical sciences. (F,SP)

74. Transition to Upper Division Mathematics. (3) Three hours of lecture per week. Prerequisites: 53 and 54. The course will focus on reading and understanding mathematical proofs. It will emphasize precise thinking and the presentation of mathematical results, both orally and in written form. The course is intended for students who are considering majors in mathematics but wish additional training. (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)

98. Supervised Group Study. (1-4) Must be taken on a letter grade basis. Directed Group Study, topics vary with instructor. (F,SP)

Upper Division Courses

C103. Introduction to Mathematical Economics. (3) Three hours of lecture per week. Prerequisites: 53 and 54. Formerly 103. Selected topics illustrating the application of mathematics to economic theory. This course is intended for upper-division students in Math, Statistics, Physical Sciences, Economics, Engineering, and for economics majors with adequate mathematical preparation. No economic background is required. Also listed as Economics C103.

104. Introduction to Analysis. (4) Three hours of lecture per week. Prerequisites: 53 and 54. The real number system, limits, continuity, and functions in R and Rn. The concept of a metric space. Uniform convergence, interchange of limit operations. Infinite series. Mean value theorem and applications. The Riemann integral. (F,SP)

H104. Introduction to Analysis. (4) Three hours of lecture per week. Prerequisites: 53 and 54. Honors section corresponding to 104. Recommended for students who enjoy mathematics and are good at it. Greater emphasis on theory and challenging problems. (F)

105. Second Course in Analysis. (4) Three hours of lecture per week. Prerequisites: 53 and 54. Techniques of integration in Rn: the derivative as a linear map; the chain rule; inverse and implicit function theorems. Lebesgue integration on the line; comparison of Lebesgue and Riemann integrals. Convergence theorems. Fourier series; L2 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. Prerequisites: 53 and 54. Matrices, vector spaces, linear transformations, inner products, determinants. Eigenvalues and eigenvectors. Quadratic forms and Rayleigh’s principle. Jordan canonical form, applications. Linear functionals. (F,SP)

H110. Linear Algebra. (4) No credit allowed after completion of Math 112 or 113B. Three hours of lecture per week. Prerequisites: 53 and 54. Matrices, vector spaces, linear transformations, inner products, determinants, and eigenvalues and eigenvectors. Quadratic forms and Rayleigh’s principle. Jordan canonical forms, applications. Linear functionals. (F,SP)


H113. Introduction to Abstract Algebra. (4) Three hours of lecture per week. Prerequisites: Same as Math 112. 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: 53 and 54. 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)

115. Introduction to Number Theory. (4) Three hours of lecture per week. Prerequisites: 110, 53, and 54. Divisibility, congruences, numerical functions, theory of primes. Topics selected: Diophantine analysis, continued fractions, partitions, quadratic fields, asymptotic distributions, additive problems. (SP)

116. Waves 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)

119. Introduction to Applied Mathematics. (4) Three hours of lecture per week. Prerequisites: 110, 53, and 54. A sample of ideas important in the mathematical sciences. Topics: duality in constrained optimization, structure of equilibrium equations (both discrete and continuous), conservation laws, partial differential equations, conservation laws, uses of (fast) Fourier transforms, calculus of variations, use of complex analysis, chaos. (F)

121A-121B. Mathematical Tools for the Physical Sciences. (4:4) Three hours of lecture per week. Prerequisites: 53 and 54. Functions of a complex variable, Fourier series, finite-dimensional linear systems. Eigenvectors, eigenvalues, orthonormal expansions, special functions, partial differential equations arising in mathematical physics. Intended for students in the physical sciences who are not planning to take more advanced mathematics courses. (F,SP)

123. Ordinary Differential Equations. (4) Three hours of lecture per week. Prerequisites: 104. Existence and uniqueness of solutions, linear systems, regular singular points. Other topics selected from analytic 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 grammar, semantical interpretation, formal deduction, 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: 104. Classification of second order equations, boundary value problems for elliptic equations, initial value problems for hyperbolic equations, existence and uniqueness theorems in simple cases, maximum principles, a priori bounds, the Fourier transform. (SP)

128A. Numerical Analysis. (5) Three hours of lecture, one hour discussion and three hours of 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. (5) Three hours of lecture, one hour discussion and three hours of computer laboratory per week. Prerequisites: 110 and 113. Systems of nonlinear equations, evaluation of eigenvalues and eigenvectors of matrices, applications to simple partial differential equations. Practice on the computer. (SP)

130. The Classical Geometries. (4) Three hours of lecture per week. Prerequisites: 110 and 113. A critical examination of Euclid’s Elements, including compass constructions; connections with Galois theory; Hilbert’s axioms for geometry, theory of areas, introduction of coordinates, non-Euclidean geometry, regular solids, projective geometry. (F,SP)

135. Introduction to the Theory of Sets. (4) Three hours of lecture per week. Prerequisites: 113 and 104. Set-theoretical paradoxes and means of avoiding them. Sets, relations, functions, order and well-order. Proof by transfinite induction and definitions by transfinite recursion. Cardinal and ordinal numbers and their arithmetic. Construction of the real numbers. Axiom of choice and its consequences. (F,SP)

140. Metric Differential Geometry. (4) Three hours of lecture per week. Prerequisites: 104 or 121B. Frenet-Serret formulas for curves in Euclidean space, first and second fundamental forms. Gaussian and mean curvature, isometries, geodesics, parallelism, the Gauss-Bonnet-Von Dyck Theorem. (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, classification of compact one-manifolds, transversality and intersection modulo 2.

142. Elementary Algebraic Topology. (4) Three hours of lecture per week. Prerequisites: 104 and 113. The topology of one and two dimensional spaces: manifolds and triangulation, classification of surfaces, fundamental group and covering spaces. (F,SP)

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 seventeenth century and selected topics from more recent mathematical history. (SP)

185. Introduction to Complex Analysis. (4) Three hours of lecture 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
H185. Introduction to Complex Analysis. (4) Three hours of lecture per week. Prerequisites: 104. Honors section corresponding to Math 185 for exceptional students with strong mathematical inclination and motivation. Emphasis is on rigor, depth, and hard problems. (SP)

187. Senior Level Analysis. (4) Three hours of lecture per week. Prerequisites: 104, 113, and 185. Course gives a comprehensive view of analysis. Emphasis is on the interrelations among topics taken from different areas of analysis and group representation, elementary functional analysis and special functions.

189. Mathematical Methods in Classical and Quantum Mechanics. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 104, 110, 2 semesters lower division Physics. Topics in mechanics presented from a mathematical viewpoint; e.g., hamiltonian mechanics and symplectic geometry, differential equations for fluids, spectral theory in quantum mechanics, probability theory and statistical mechanics. See department bulletins for specific topics each semester course is offered. (SP)

191. Experimental Courses in Mathematics. (1-4) Course may be repeated for credit. Hours to be arranged. Prerequisites: Consent of instructor. 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. See department bulletins.

195. Special Topics in Mathematics. (4) Course may be repeated for credit. Hours to be arranged. Prerequisites: Consent of instructor. Lectures on special topics, which will be announced at the beginning of each semester that the course is offered.

196. Honors Thesis. (4) Course may be repeated for credit. Hours to be arranged. Prerequisites: Admission to the Honors Program; an overall GPA of 3.3 and a GPA of 3.5 in the major. Independent study of an advanced topic leading to an honors thesis. (F,SP)

199. Supervised Independent Study and Research. (1-4) Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: The standard college regulations for all 199 courses. (F,SP)

Graduate Courses


208. C*-algebras. (4) Three hours of lecture per week. Prerequisites: 202A. 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-Takesaki theory, subfactors, group actions, and actions of a group C*-algebra.

209. Von Neumann Algebras. (4) 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-Takesaki theory, subfactors, group actions, and actions of a group C*-algebra. (F,SP)


211. Several Complex Variables. (4) Three hours of lecture per week. Prerequisites: 185 and 202A-202B or their equivalents. Power series developments, 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. (4,4) Three hours of lecture per week. Prerequisites: 110 and 113. Fundamental groups. Homology groups and covering spaces. Homotopy theory, fibrations, relations between homotopy and homology, obstruction theory, and topics from spectral sequences, cohomology operations, and characteristic classes. Sequence begins fall.

219. Ordinary Differential Equations and Flows. (4) Three hours of lecture per week. Prerequisites: 214. Ordinary differential equations. Difference mappings and flows on manifolds. Stable manifolds, generic properties, transversal stability. Special topics selected by the instructor. (F)

220. Methods of Applied Mathematics. (4) Three hours of lecture per week. Variational principles; optimization; control; dynamical systems; stochastic ordinary differential equations; estimation; data analysis. (F,SP)

221. Advanced Matrix Computations. (4) Three hours of lecture per week. Prerequisites: 105 or 202B. The theory of initial value and boundary value problems for hyperbolic, parabolic, and elliptic partial differential equations, with emphasis on non-linear equations. More general types of equations and systems of equations. Sequence begins fall.


225A-225B. Metamathematics. (4,4) Three hours of lecture per week. Prerequisites: 125B and 135. Metamathematics: undecidability and Gödel’s theorems, recursive functions, incompleteness theorems, intuitionism, non-standard models, recursive objects of higher type. Sequence begins fall.

226A. Abstract Machines and Languages. (4) Three hours of lecture per week. Prerequisites: 135; 114 or 113 and 110. Finite state automata, regular sets, Turing machines, recursive functions, decision problems, context-free languages, recursive sets, recursive functions, lambda calculus, ambiguity, special families of languages, power series in non-commuting variables.

227A-227B. Theory of Recursive Functions. (4,4) Three hours of lecture per week. Prerequisites: 225B. Recursive and recursively enumerable sets of natural numbers, characterization of recursively enumerable sets, recursive functions and sets, recursive functionals and sets, recursion theory, incompleteness theorems, relative computability, degrees of unsolvability. The recursion theorem. Constructive ordinals, the hyperarithmetical and analytical hierarchies. Recursive objects of higher type. Sequence begins fall.


235A-235B. Theory of Sets. (4,4) Three hours of lecture per week. Prerequisites: 125A and 135. Axiomatic foundations. Operations on sets and relations. Images and set functions. Ordering, well-ordering, and well-founded relations; general principles of induction and


242. Symplectic Geometry. (4) Three hours of lecture per week. Prerequisites: 214. Basic symplectic linear algebra, symplectic manifolds, Darboux theorem, cotangent bundles, variational problems and Legendre transform, hamiltonian systems, lagrangian submanifolds, Poisson brackets, symmetry groups and momentum mappings, coadjoint orbits, Kahler manifolds. (SP)

245A-245B. General Theory of Algebraic Structures. (4,4) Three hours of lecture per week. Prerequisites: 113 and 135. Structures defined by operations and/or relations, and their homomorphisms. 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.


250B. Multilinear Algebra and Further Topics. (4) Three hours of lecture per week. Prerequisites: 250A. Tensor algebras and exterior algebras, with application to linear transformations. Commutative ideal theory, localization. Elliptic operators, spectral specialization and valuation theory. Related topics in algebra. (SP)

251. Ring Theory. (4) Three hours of lecture per week. Prerequisites: 250A. Topics such as: Noetherian rings, rings with descending chain condition, theory of the radical, homological methods.

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, functors and derived functors, homological dimension of rings and modules.

254A-254B. Number Theory. (4,4) Three hours of lecture per week. Prerequisites: 250A. Valuations, 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, diophantine equations, P-adic analysis, and transcendental numbers. Sequence begins fall.

255. Algebraic Curves. (4) Three hours of lecture per week. Prerequisites: 250A or consent of instructor. Elliptic curves. Algebraic curves, Riemann surfaces, and function fields. Singularities. Riemann-Roch theorem, Hurwitz’s theorem, projective embeddings and the canonical and syzygy theorems. 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. Affine and projective algebraic varieties, theory of schemes and morphisms of schemes, Smoothness and differentials in algebraic geometry, coherent 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, permutation groups, character theory, solvable groups, simple groups, transfer and cohomological methods. (SP)

258. Classical Harmonic Analysis. (4) Three hours of lecture per week. Prerequisites: 206 or a basic knowledge of real, complex, and linear analysis. Basic properties of Fourier series, convergence and summability, Hardy spaces, boundary behavior of analytic and harmonic functions. Additional topics at the discretion of the instructor.

260. Abstract Harmonic Analysis. (4) Three hours of lecture per week. Prerequisites: 256. Topological groups, Haar measure, Pontryagin duality, and structure theory of locally compact Abelian groups. Peter-Weyl theorem for compact groups. Further topics may include finer study of harmonic analysis on commutative groups, or else head in the direction of group representations for noncommutative locally compact groups.

261A-261B. Lie Groups. (4,4) Three hours of lecture per week. Prerequisites: 214. Lie groups and Lie algebras, fundamental theorems of Lie, general structure theory, compact, solvable, semi-simple Lie groups; classification theory and representation theory of semi-simple Lie algebras and Lie groups, further topics such as symmetric spaces, Lie transformation groups, etc. (F,SP)


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 instructor. Advanced topics chosen by the instructor. The content of this course changes, as in the case of seminars.

274. Topics in Algebra. (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.

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. Prerequisites: 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 instructor. Advanced topics chosen by the instructor. The content of this course changes, as in the case of seminars.

290. Seminars. (1-6) Course may be repeated for credit. Hours to be arranged. Topics in foundations of mathematics, number, numerical calculations, analysis, geometry, topology, algebra, and their applications, by means of lectures and informal conferences; work based largely on original memoirs. (F,SP)

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. Sections 31-60 to be graded on a satisfactory/unsatisfactory basis. In- tended 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 satisfactory/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. Hours do not satisfy unit or residence requirements for master’s degree. Courses may be repeated once 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.

300. Teaching Workshop. (3) Two hours of lecture per week, plus class visits. Must be taken on a satisfactory/unsatisfactory basis. The course is required for graduate students teaching for the first time in the department. The course consists of practice teaching, alternative to standard classroom methods, guided by a member of the department. The course is required for all graduate students teaching for the first time in the department. (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 satisfactory/unsatisfactory basis. Permission of SLC instructor, as well as sophomores standing and at least a B average in two semesters of calculus. Apply at Student Learning Center. May be taken for one unit by special permission of instructor. Tutoring at the Student Learning Center for the Professional Development Program. (F,SP)
Mechanical Engineering
(College of Engineering)

Department Office: 6195 Echtridge Hall, (510) 642-1338
http://me.berkeley.edu
Chair: J. Karl Hedrick, Ph.D.

University Professor
†Chang-Lin Tien (NIEC Distinguished Professor of Engineering), Ph.D. Princeton University. Heat and mass transfer.

Professors
Alice M. Arminio (Roe-Soo and Elizabeth Hughes Chair in Mechanical Engineering), Ph.D. Stanford University. Decision and expert systems.
David M. Austander (Associate Dean, Research and Student Affairs), Sc.D. Massachusetts Institute of Technology. Dynamic systems and automatic controls.
†Stanley A. Berger, Ph.D. Brown University. Fluid systems design.
David B. Bogy (William S. Floyd, Jr., Distinguished Professor in Engineering), Ph.D. Brown University. Elasticity, plasticity, computer mechanics.
James Casey, Ph.D. University of California, Berkeley. Continuum mechanics.
Julian Y. Chang, Ph.D. Cornell University. Turbine combustion, chemical kinetics, numerical simulation.
Han Uharan, Ph.D. University of California, Berkeley. Composite materials.
Robert W. Dibble, Ph.D. University of Wisconsin. Corrosion, propulsion.
David A. Dornfeld, Ph.D. University of Wisconsin. Manufacturing processes, robotics (Associated Dean, Interdisciplinary Studies).
Carlos Fernandez-Pello, Ph.D. University of California at San Diego. Combustion, heat and condensed fuels.
Michael Y. Frenklach, Ph.D. Hebrew University. Chemical kinetics, combustion chemistry, chemical vapor deposition.
†Werner Goldsmith, Ph.D.
†Ralph Greif, Ph.D. Harvard University. Thermal radiation, phase change.
Costas Grigoropoulos, Ph.D. Columbia University. Heat and mass transfer.
†Oliver M. O'Reilly, Ph.D. Cornell University. Nonlinear dynamics with applications to continuum mechanics.
V. Parvatiyar Padapagouda, Ph.D. University of California, Berkeley. Computational fluid dynamics.
†Lisa A. Pruit, Ph.D. Brown University. Tissue biomechanics, biomaterial science.
Andrew J. Szeri, Ph.D. Cornell University. Fluid dynamics and nonlinear dynamics.

Assistant Professors
Liwei Lin, Ph.D. University of California, Berkeley. NSF-Career MEMS (microelectromechanical systems).

Professors
Kurt S. Spiegel, Ph.D. (In Residence) (Emeritus) Lawrence Stark, M.D. (Emeritus)

Associate Professor
David M. Rempel, M.D. M.P.H. (In Residence)

Adjunct Professor
Gary T. Chapman, Ph.D.

Overview
Mechanical Engineering includes the science and art of the formulation, design, development, and control of systems and components involving thermodynamics, mechanics, fluid mechanics, mechanisms, and the conversion of energy into useful work. The mechanical engineer has a thorough preparation in mathematics, physics, chemistry, manufacturing processes, properties of materials, mechanics, fluid mechanics, thermodynamics, as well as intensive design and laboratory experience. The program of study includes basic subjects common to all engineering fields, fundamental subjects important to all mechanical engineers and specialization in one or more phases of mechanical engineering.

The undergraduate program begins at the freshman level with study in the humanities, mathematics, basic sciences, and the foundation design course, Engineering 28. In subsequent years students learn to use engineering science concepts as tools for systems analysis and design. The design and laboratory experience is a major component of the senior year. Significant transfer opportunities are available to develop a broad hands-on understanding of the design process involved in significant engineering systems. Undergraduate specialization is provided in the choice of technical electives which may be selected from the subject areas of applied mechanics, automatic controls, electro-mechanical systems analysis, energy conversion, fluid mechanics, heat transfer, materials processing, mechanical design, naval architecture, nuclear engineering, cryogenics, thermodynamics, and biomedical, environmental, and petroleum engineering.

Because of the widening range of technical problems and the limited amount of specialization available in the undergraduate curriculum, qualified students should consider graduate study to enhance their scientific and technological capability. Further details of undergraduate engineering fields of emphasis in mechanical engineering are available in the Announcement of the College of Engineering. The brochure available a detailed the undergraduate and graduate programs in mechanical engineering.

The B.S. program is accredited in mechanical engineering by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). The College of Engineering and Computer Sciences 100; Civil Engineering 130.

Curriculum for the Bachelor's Degree
A total of 120 units is required, including:
Lower Division, Mathematics 1A-1B, 53 and 54; Chemistry 1A; Physics 7A-7B-C (Chemistry 1B or Biology 1A may be taken for Physics 7C); Engineering 77, 28, 36, 45.

Upper Division, Mechanical Engineering 102A-102B, 104, 105, 106, 107A-107B, 109, Engineering 160; Electrical Engineering 125; Computer Sciences 100; Civil Engineering 130.

Note: All students must complete (a) six courses of at least 3 units each in humanities and social studies selected from an approved list of courses (please see the "Humanities and Social Studies" section of the Announcement of the College of Engineering); (b) 12 units technical electives, at least 9 in upper division elective mechanical engineering courses. Of these, 3 units must be in an elective course selected from the following list: ME 101, 110, 128, 130, 135, 142, 161. The other technical elective units can be chosen from courses in engineering, physical sciences, mathematics, or statistics. No more than one lower division course can be used to satisfy part of the technical elective requirement. Lower division courses acceptable for technical elective credit in mechanical engineering: Astronomy 7; Biology 1A-1B; Chemistry 1B, 5; Engineering 50, 66; Civil Engineering 70; Molecular and Cell Biology 11, 32; Statistics 20, 25, or any upper division course required by another engineering major.

Mechanical Engineering Options. The following groups of electives are presented to help undergraduates focus their choices on specific professional goals. Each group contains more courses than can be taken within the standard allowance. The electives need not be from any single group.

Controls. Mechanical Engineering 132, 133, 134, 135, 136, 175; Engineering 119, 177; Electrical Engineering and Computer Sciences 120, 128.


Combustion. Chemical Engineering 140, 142; Civil Engineering 111, 112; Electrical Engineering 107, 117, C150; Mechanical Engineering 110, 140, 151; Material Science Engineering 146, 148, 161.

Environmental Engineering. Engineering 117, 150, 151, 160, 161, 162; Mechanical Engineering 110, 111, 140, 142, 151, 173; Civil Engineering 110, 140; Nuclear Engineering 162; Geography 144, 147; Architecture 149.

Fluid Mechanics and Aeronautics. Engineering 117, 118; Mechanical Engineering 133, 134, 150, 151, 161, 162, 163, 165, 173, 175, 185; Civil Engineering 131.


Mechatronics. Electrical Engineering 104; Engineering 66, 119, 166, 177; Mechanical Engineering 101, 128, 130, 132, 134, 135.

Nuclear Engineering. Nuclear Engineering 101, 102, 120, 150, 161; Mechanical Engineering 132, 134, 145, 161, 173; Physics 137; Mathematics 120, 120B.

Ocean Engineering. Civil Engineering 120, 180; Engineering 164, 165, 167; Mechanical Engineering 125; Industrial Engineering 140, 170.


Graduate Programs

Both master's and doctoral programs are available. The student may choose either a scientific emphasis in particular areas or integrated studies designed for professional objectives. Master of Science and Ph.D. degrees are the relevant degrees for the scientific emphasis, and Master of Engineering and D.Eng. degrees for the professional one. Specialization is offered in the following areas: (1) bioengineering, (2) controls and mechatronics, (3) design, (4) dynamics and dynamical systems, (5) environmental engineering, (6) fluid mechanics, (7) heat and mass transfer, (8) manufacturing, (9) mechanics of deformable solids, (10) micro- and nanoelectromechanical systems (MEMS), (11) thermodynamics, (12) combustion. Details on various topics under the sponsorship and direction of a student with the profession and the activities of the faculty. (F,SP)

98. Supervised Independent Group Studies. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a pass/no pass basis. (F,SP)

Upper Division Courses

101. High Mix/Low Volume Manufacturing. (3) Three hours of lecture per week. Prerequisites: 102A or consent of instructor. Fundamentals of high mix/low volume (HMLV) manufacturing fundamentals, unit operations and manufacturing line considerations for work in process (WIP), manufacturing lead time (MLT), economics, quality monitoring, and work in process (WIP) management including just-in-time (JIT), kanban, buffers and line balancing; class project/course studies for design of competitive manufacturing systems. (F) Dornfeld

102A. Mechanical Behavior and Processing of Materials. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Civil Engineering 130; Engineering 45. This course covers elastic and plastic deformation under static and dynamic loads. Prediction and prevention of failure by yielding, buckling, fracture, fatigue, creep, and wear. Environmental influences, residual stress effects. Selection, forming, cutting, and heat treatment of materials based on design requirements. (F,SP) Pruitt

102B. Mechanical Engineering Design. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: Engineering 104, 107. Application of principles of mechanics, material science and manufacturing processes to the design of components and complete machines which must meet specified performance specifications. Analysis of a major machine design project. (F,SP)

104. Engineering Mechanics II. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Engineering 36, 77N, and Mathematics 54. This course is an introduction to the dynamics of particles and rigid bodies. The Newtonian formulation of the governing equations, 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) O'Reilly

105. Thermodynamics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 1A, Mathematics 53, Physics 7A, and Engineering 77N; or consent of instructor. Basic principles of thermodynamics which are applied to various areas of engineering related to energy conversion and air conditioning. (F,SP) Fernandez-Pello

106. Fluid Mechanics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 104. This course introduces the fundamentals and techniques of fluid mechanics with an emphasis on understanding and controlling engineering flows. (F,SP) Yeung

107A. Experimentation and Measurement. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: 104, 105, 106, 109, Electrical Engineering 100, Engineering 190. Methods and procedures used for experiments in mechanical engineering phenomena and systems. Experimental design, measurement systems, data acquisition, and data analysis. Modeling of measurement and experimental systems. (F,SP) Johns, and others.

107B. Mechanical Engineering Laboratory. (3) Six hours of laboratory per week. Prerequisites: 107A. Experimental investigation of engineering systems and of phenomena of interest to mechanical engineers. Design and planning of experiments. Analysis of data and reporting of experiments. (F,SP)

109. Heat Transfer. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 105 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) Pagni

110. Introduction to Product Development. (3) Three hours of lecture per week. Prerequisites: Engineering 102B, 107A (which may be taken concurrently). The course provides an introduction to the design of complex and realistic mechanical engineering systems. Design concepts and processes 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. Individual systems and social, economic, and political implications are included. Both individual and group oral presentations are made, and participation in conferences is required. (F)

C117. Structural Biomechanics of Materials. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A, Engineering 45, and Civil Engineering 130. This course covers the mechanical and structural aspects of biological tissues and their replacements. Tissue structure and mechanical function are addressed. Natural and synthetic load-bearing biomaterials for clinical and medical applications are reviewed. Bionocompatibility of biomaterials and host response to structural implants are examined. Quantitative treatment of biomechanical issues and constitutive relationships of tissues and biomaterials are covered. Material selection of biomaterials and applications including reconstructive surgery, orthopedics, dentistry, and cardiology. Mechanical design for longevity including topics of fatigue, wear, and fracture. Manufacturing of biodegradable implants and hybrid materials. Design and testing in tissue engineering. Also listed as Bioengineering C117. (SP) Pruitt

119. Introduction to MEMS (Microelectromechanical Systems). (3) Three hours of lecture per week. Prerequisites: Electrical Engineering 100, Physics 7B. Fundamentals of microelectromechanical systems including design, fabrication of microstructures; surface-micromachining, bulk-micromachining, LIGA, and other micro machining processes; fabrication principles of integrated circuit devices; techniques of forming MEMS devices; high-aspect-ratio microstructures; scaling issues in the micro scale (heat transfer, fluid mechanics and solid mechanics); device design, analysis and layout. (F,SP)

122. Processing of Materials in Manufacturing. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 102A; Civil Engineering 130. Fundamentals of manufacturing processes (metal forming, metal cutting, 77N; or consent of instructor). Selection of metals, plastics and other materials relative to the design and choice of manufacturing processes. (F)

C123. Microfabrication Equipment Laboratory. (2) One hour of lecture and three hours of laboratory per week. Prerequisites: Electrical Engineering 40 or 100,

128. Computer-Aided Mechanical Design. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 102B, Engineering 28, Civil Engineering 130, and Mathematics 53, 54, or consent of instructor. Introduction to computer-aided design and analysis of engineering systems using MATLAB software on Windows workstations. The student will be introduced to a variety of mechanical design techniques and apply those techniques to the design of mechanisms, automobiles, and mechanical components. Three hours of lecture and two hours of discussion. (F) Pisano

130. Design of Planar Machinery. (3) Three hours of lecture and one hour of laboratory per week. Prerequisites: 104. Synthesis, analysis, and design of planar machines. Kinematic structure, graphical, analytical, and numerical analysis and synthesis. Linkages, cams, reciprocating engines, gear trains, and flywheels. (SP) Pisano


133. Mechanical Vibrations. (3) Three hours of lecture per week. Prerequisites: 104. An introduction to the theory of mechanical vibrations including topics of harmonic motion, resonance, transient and random excitation, energy, linearization, and nonlinear vibrational convolutions. Multidegree of freedom systems including principal mode, principal coordinates and Rayleigh’s principle. (F) Tongue

134. Automatic Control Systems. (4) Three hours of lecture and one hour of discussion per week, and three hours of laboratory every other week. Prerequisites: 132. Linear control systems analysis and design in transform domain and time domain. Transfer functions and state equations. Frequency response and Nyquist stability. Loop shaping. State feedback controller and observer design. Applications to mechanical and mechatronics systems. Computer control. (F,SP) Tomizuka

135. Design of Microprocessor-Based Mechanical Systems. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: Engineering 7. This course provides preparation for the conceptual design and prototyping of mechanical systems that use microprocessors to control machine activities, acquire data and analyze data, and interface to operators. The architecture of microprocessors is related to problems in mechanical systems through study of systems, including electro-mechanical components, thermal components and a variety of instruments. Laboratory exercises lead through studies of different levels of software. (SP) Armstrong

136. Mechatronics and Robotics Design. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Consent of instructor. This subject offers a mechatronics approach to the design of robots and automated systems covering the design of components such as sensors, actuators, control and computer interface. Basic kinematics and the robotic systems, design dynamics of robotic systems, hydraulic and pneumatic systems, electric actuators, control of mechanical systems, surrounding electrical and computer interface. Basic kinematics and the robotic systems, design dynamics of robotic systems, hydraulic and pneumatic systems, electric actuators, control of mechanical systems, surrounding electrical and computer interface. Basic kinematics and the robotic systems, design dynamics of robotic systems, hydraulic and pneumatic systems, electric actuators, control of mechanical systems, surrounding electrical and computer interface. (F) Fernandez-Pello

140. Combustion Processes. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 105 and 106. May be taken concurrently. Fundamentals of combustion, flame structure, structure speed, flame sheath, luminosity, ignition, stirred reaction, kinetics and nonequilibrium. Application to engines, energy production and fire safety. (F) Kazerouni

142. Thermal Environmental Control. (3) Three hours of lecture per week. Prerequisites: 105 or equivalent; 106, 109 (may be taken concurrently). The course will cover models and transport phenomena associated with a broad spectrum of thermal control applications. Emphasis will be on application of theoretical concepts to the design of advanced thermal control systems. Topics covered will include enhanced vapor compression heat pumps, gas compression cycles, psychrometrics, cooling towers, descanting cooling, absorption refrigeration, Joule-Thomson cooling, organic Rankine cooling cycle, heat exchangers, heat pipes, and advanced insulation concepts. Applications in thermal control of buildings, automobiles, spacecraft, and electronics will be discussed. (SP) Carey

145. Computer-Aided Thermal Design. (3) Three hours of lecture and one voluntary hour of discussion per week. Prerequisites: 105, 106, and 109 or consent of instructor. This course introduces the use of modern computational tools to model thermal performance characteristics of complex systems. Emphasizes the simulation of thermodynamics with advanced computational methodologies to facilitate engineering design of components and systems. The course also will stress the use of computer graphics to visualize the results. Sample applications discussed in the course may include thermal control of microelectronic components, solar energy systems, combustion based power systems, cryogenics, thermal control of vehicles. Students must complete two assignments based projects that require use of analytical tools from the thermosciences together with advanced computational tools developed in class lectures. (SP) Carey

151. Advanced Heat Transfer. (3) Three hours of lecture per week. Prerequisites: 105, 106 and 109. Basic principles of heat transfer and their application. Subject areas include steady-state and transient system analyses for conduction, free and forced convection, boiling, condensation and thermal radiation. (SP) Pagni

161. Applied Fluid Mechanics. (3) Three hours of lecture per week. Prerequisites: 105 and 106. Operating principles and characteristics of fluid in conduits, lubrication systems, pumps, turbines and compressors will be discussed. Examples of geometries, concepts of potential flow, laminar viscous flow and turbulent flow. (F) Savas

163. Engineering Aerodynamics. (3) Three hours of lecture per week. Prerequisites: 106. Introduction to the lift, drag, and moment of two-dimensional airfoils, three-dimensional wings, and the complete airplane. Calculations of the performance and stability of airplanes in subsonic flight. (SP)


165. Ocean-Environment Mechanics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 106, 109, 110, Mechanical Engineering 130 or consent of instructor. Formerly Engineering 164. Terrestrial and definition of hull forms, conditions of static equilibrium and stability of floating submerged bodies. Effects of damage on stability. Structural loads and response. Box girder theory, isotropic and orthotropic plate bending and buckling. Also listed as Engineering C164. (F) Mansour


170. Engineering Mechanics II. (3) Students who have taken 104 between Fall 1983 and Spring 1985 will receive 1 unit of credit for 170. Two hours of lecture per week. Prerequisites: 104. Newtonian Dynamics of a particle or system of particles in two-dimensional motion. (F,SP) O'Reilly


175. Intermediate Dynamics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 104 or equivalent. This course introduces and investigates Lagrange’s equations of motion for particles and rigid bodies. The subject matter is particularly relevant to applications comprised of interconnected and constrained discrete mechanical components. The material is illustrated with numerous examples. These range from one-dimensional motion of a single particle to three-dimensional motions of rigid bodies and systems of rigid bodies. (F) O’Reilly

C176. Orthopaedic Biomechanics. (4) Three hours of lecture and one hour of discussion/labatory per week. Prerequisites: Civil Engineering 130; 102A, 104 or consent of instructor, or consent of instructor. Course examines and evaluates the mechanics of bones and muscles, and calculates the biological and mechanical properties of bone and musculoskeletal connective tissue. Special attention is focused on the study of bone adaptation, remodeling, and fracture risk prediction of whole bones; bone remodeling; orthopaedic implants; applications of composite beam, bone-on-elastic foundation, and Hertz contact theories to the design of artificial bone and knee replacements. Also listed as Bioengineering C176. (F) Keaveny

185. Introduction to Continuum Mechanics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Physics 7A; Mathematics 53, 54. Kinematics of deformation, the concept of stress, conservation of mass and balance of linear momentum,
angular momentum and energy, Mechanical constitutive equations for ideal fluid, linear elastic solid. (F,SP) Casey, Papadopoulos

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. 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 maximum of 3 units of H194 must be used to 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. Must be taken on a pass/credit basis. Prerequisites: Upper division standing and good academic standing. Group study of a selected topic or topics in Mechanical Engineering. Credit for 198 or 199 courses combined may not exceed 4 units in any single term. See College for other restrictions. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a pass/credit basis. Prerequisites: Consent of instructor and major adviser. Supervised independent study. Enrollment restrictions apply. For Courses and Curricula section of this catalog. (F,SP) Staff

Graduate Courses

210. Biological Control Systems. (3) One and one-half hours of lecture and three hours of laboratory per week. Prerequisites: Upper division standing and consent of instructor. Engineering analysis, especially application of modern control theory, of complex biological systems; dynamical engineering evaluation of anatomical-physiological systems. Experimental methods applied to biological control systems in the laboratory, with specialized bioengineering transducers and online digital computers. Digital simulation to interpret experimental data and elucidate design features of these living systems. (F) Staff

212. Heat and Mass Transport in Biomedical Engineering. (3) Students who took 21B in Spring 1990 cannot take 212 for credit. Three hours of lecture per week. Prerequisites: 106, 109 or consent of instructor. 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 phenomena. Applications to biomedical engineering. (F) Rubinsky

213. Fluid Mechanics of Biological Systems. (3) Three hours of lecture per week. Prerequisites: 106 or equivalent; 265A or consent of instructor. Investigation of fluid mechanical aspects of various physiological systems including circulatory, pulmonary, and renal systems. Motion in the large and small blood vessels, Pulsatile and peristaltic flow. Analysis of prosthetic devices. Fluid flow related to biological systems in bio-processing applications. Integrated fluid flow models of systems in biological systems. (F) Bergel

214. Structure-Function Relationships for Biological Tissues. (3) Three hours of lecture per week. Prerequisites: 102A, 176, 185; graduate standing or consent of instructor. The goal of this course is to develop a hierarchy of characterizing and understanding the structure-function relationships for any load-bearing tissue. Using a range of musculoskeletal tissues as examples, micro-mechanical analysis of the tissue microstructure will be used to explain and model the material continuum-structure behavior. Specific applications of theory will include anisotropic elasticity, composite mechanics, continuum damage theory, cellular solids, bio and biphasic theories, solid-fluid interactions, viscoelasticity, and biological responses to mechanical stimuli including repetitive loading. Current clinical problems in orthopedics and ergonomics will illustrate practical applications. (SP) Reaven

219. Microelectromechanical Systems. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. This course is aimed to provide basic understanding of integrated circuit (IC) processes and microelectromechanical systems (MEMS). Technological applications including analyses, design, and manufacturing processes of MEMS will be introduced. The first part of the course emphasizes on IC processes including thin film deposition, lithography, and etching. The second part of the course deals with micromachining processes including surface-, bulk-micromachining, LIGA, and other processes. (SP) Lin

220. Precision Manufacturing. (3) Three hours of lecture per week. Prerequisites: 101, 102B, or consent of instructor. General engineering for precision manufacturing. Emphasis on design and performance of precision machinery for manufacturing. Topics include machine tool elements and structure, sources of error (thermal, static, dynamic, process related), precision machining processes and process models (diamond turning and abrasive (fixed and free) processes), sensors for process monitoring and control, metrology, machine design case studies and examples of precision component manufacture. (SP) Domfelt

221. eManufacture.com. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. This course presents an overview of the theory of manufacturing processes, machine tool design, and flexibility, precision and variability of manufacturing processes. (F) Wright

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 flexibility, precision and variability of manufacturing processes. (F) Sheng

229. Metal Cutting. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Metal cutting and metal removal processes. (F,P) Wright

232. Polymer Engineering. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Civil Engineering 130, Engineering 45. A survey of the structure and properties of materials used in 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. (P) Engler

224. Mechanical Behavior of Engineering Materials. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Civil and Environmental Engineering 130; Engineering 45. This course covers elastic and plastic deformation under static and dynamic loads, plasticity and phenomena of failure by yielding, fracture, fatigue, creep, corrosion, and wear. (P) Komvopoulos

C225. Deformation and Fracture of Engineering Materials. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Civil Engineering 130, Engineering 45. This course covers deformation and fracture behavior of engineering materials for both monotonic and cyclic loading conditions. Also listed as Materials Science and Engineering C212. (SP) Pratt, Ritchie


227. Mechanical Behavior of Composite Materials. (3) No credit for 227 after 299U. Three hours of lecture per week. Prerequisites: Graduate standing. Formerly 299U. Response of composite materials (fibre and particulate-reinforced materials) to static, cyclic, creep and thermomechanical loading. Loading processes including residual and residual stresses. Fatigue behavior, friction mechanics and damage development. Role of the reinforcement-matrix interface in mechanical behavior. Environmental effects on composite dimensional stability. Application to polymer, metal, ceramic, and carbon matrix composites. (SP) Dharan

228. Computer-Aided, Optimal Mechanical Design. (3) Three hours of lecture per week. Prerequisites: EEC 100, graduate standing or consent of instructor. Fundamental principles of magnets, electric-magnetics, and magnetic materials as applied to design and operation of electro-mechanical devices. Type of device to be used in a particular application and dimensions of parts for the overall design will be discussed. Typical applications are linear and rotary actuators, stepper motors, AC motors, and DC brush and brushless motors. A design project is required. (SP) Liu

230. Real-Time Applications of Mini and Micro Computers. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Graduate standing in engineering or consent of instructor for advanced undergraduates. Mini and micro computers, 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 operating modes and through laboratory work with mini and micro computer systems. (F) Auslander

232. Advanced Control Systems I. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 134 recommended. Input-output and state space representation of linear discrete and time dynamic systems. Controllability, observability, and stability, Modelling and identification. Analysis and design of linear and multi-characteristic feedback control systems. Feedforward/preview control. Application to engineering systems. (F) Tomizuka

233. Advanced Control Systems II. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 232. Linear Quadratic Optimal Control, Stochastic State Estimation, Linear Quadratic Gaus-

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) Grigoropoulos

252. Heat Convection. (3) Three hours of lecture per week. Prerequisites: 151, 256A; Engineering 230A. The transport of heat in fluids in motion; free and 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) Grigoropoulos


255. Energy Transfer in Gaseous and Condensed Phases. (3) Three hours of lecture per week. Prerequisites: 254 or consent of instructor. Course introduces statistical thermodynamics, kinetic theory, and reaction theories, all at the level of microscopic energy transfer processes. (F) Carey


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 kinetics are used; where available reduced kinetic mechanisms are used. Analysis and interpretation of experimental data and numerical simulations. (SP) Carey

258. Heat Transfer with Phase Change. (3) Three hours of lecture per week. Prerequisites: 151. Heat transfer associated with phase change processes. Topics include: solidification, 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 kinetic theory concepts used to analyze thermophysics of microscale systems and explore applications in which microscale transport plays an important role. (F,SP) Carey

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 the equations of motion, Incompressible and compressible inviscid flows. Canonical viscous flows. (F) Liepmann

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 of fluid mechanics 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) Liepmann


240A. Advanced Marine Structures I. (3) Three hours of lecture per week. Prerequisites: Graduate standing. Formerly Naval Architecture 240A. This course introduces a probabalistic description of ocean waves and wave loads acting on marine structures. These topics are followed with discussion of structural strength and reliability analysis. (F) Hedrick

240B. Advanced Marine Structures II. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Naval Architecture 240B. This course is concerned with the structural response of marine structures to environmental loads. Overall response of the structure as well as the behavior of its members under lateral and compressive loads are discussed. (SP) Mansour


264. Waves in Fluids. (3) Three hours of lecture per week. Prerequisites: 261. Propagation of waves in linear and nonlinear waves in fluids. Wave interactions in gases including reflection and diffraction. Shock dynamics. Dispersion and dissipation analogy with surface water waves. (SP) Marcus


266. Geophysical Fluid Mechanics. (3) Three hours of lecture per week. Prerequisites: 260A or equivalent. An introduction to the fluid mechanics and atmospheric motions of the Earth's interior (mantle and core). Buoyant creeping flow. Rotation inside a sphere. Modes of wave propagation in rotation and stratified flows. (SP) Morris

268. Physicochemical Hydrodynamics. (3) Three hours of lecture per week. Prerequisites: A first graduate course in fluid mechanics such as 260A-260B. Physicochemical hydrodynamics is the interaction of fluid motion and physical, chemical, and bio-chemical processes. The usual Navier-Stokes equations of motion are supplemented with coupled equations describing the processes. The emphasis here is broad, the emphasis here is on problems in which short-range forces can be important: particle capture, stability of colloidal suspensions and the mechanics of thin films are therefore covered together with the necessary hydrodynamic background. The aim is to introduce physical problems using the framework of graduate classes in fluid mechanics, and to present the methods and models used to illuminate them. (SP) Morris

269. Magnetohydrodynamics and Materials Processing. (3) Three hours of lecture per week. Prerequisites: 260A or consent of instructor. Magnetic fields are used to control fluid motions in many types of materials processing, ranging from the continuous casting of steel and aluminium to the growth of single crystal semiconductor crystals. The flows are time to instability, the technical problem thus being to control the instability by proper shaping of the applied field. This course is an introduction to MHD, with applications to processing. (SP) Morris
271. Calculus of Variations and Optimal Control. (3) Three hours of lecture per week. An introduction to the classical calculus of variations for the simplest fixed endpoint problem. A geometric treatment of necessary and sufficient conditions for optimal continua in deterministic applications. Applications to aerospace engineering, economics, and biological systems. (SP)

273. Oscillations in Linear Systems. (3) Three hours of lecture per week. Prerequisites: 104 and 133. Response of discrete and continuous dynamical systems to external and harmonic time-dependent loading. Convolution integrals and Fourier and Laplace Transform methods. Lagrange’s equations; Eigen-solutions; Orthogonality; generalized coordinates; nonholonomic and degenerate systems; Rayleigh quotient. (F) Ma


275. Advanced Dynamics. (3) Three hours of lecture per week. Prerequisites: 175. Review of Lagrangian dynamics. Legendre transform and Hamilton’s equations, Cyclic coordinates, Canonical transformations, Hamilton’s equations, Integrability, Dynamics of asymptotic systems. Approximation theory. Current topics in analytical dynamics. (F) O’Reilly


280A. Introduction to the Finite Element Method. (3) Three hours of lecture and one hour of discussion/computer laboratory per week. Prerequisites: Mathematics 50A-50B; some familiarity with elementary field theories of solid/liquid mechanics and/or thermal sciences. Formerly 280. Weighted-residual and variational methods of approximation. Canonical construction of finite element spaces. Formulation of element and global state equations. Applications to linear partial differential equations of interest in engineering and applied science. (F) Papadopoulos


282. Theory of Elasticity. (3) Three hours of lecture per week. Prerequisites: 185. Fundamentals and general theorems of the linear theory of elasticity (three dimensions) and the formulation of static and dynamic boundary value problems. Application to torsion, flexure, and plates. Advanced problems of plate strain, generalized plane stress, and bending of plates. Representation of basic field equations in terms of displacement potentials and stress functions. Some basic three-dimensional solutions. (SP) Bogy

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 flat and curved boundaries. Stress waves due to periodic and transient sources. Some additional topics may vary with instructor. (F) Bogy


285. Foundations of the Theory of Continuous Media. (3) Three hours of lecture per week. Prerequisites: 185. A general development of thermodynamic models of deformable media, entropy production, and related entropy inequalities. Thermomechanical responses of dissipative media, including those for viscous fluids and nonlinear elastic solids. A discussion of invariance, internal constants, material symmetry, and other special topics. (F) Casey

286. Theory of Plasticity. (3) Three hours of lecture per week. Prerequisites: 185. Formulation of the theory of plasticity relative to loading surfaces in both strain space and stress space and associated loading criteria. Nonlinear constitutive laws for finite deformed elastic-plastic materials. Discussion of strain-hardening and special cases. Applications. (F) Bogy


290A. Nonlinear Dynamics of Continuous Systems. (3) Three hours of lecture per week. Prerequisites: 175, 185. This course uses methods from dynamical systems theory for the analysis of the nonlinear dynamics of deformable continua and discrete systems. The objective of the course is to present a coherent and integrated approach to the analysis of special problems, group participation in computing projects, and oral presentation. (F) Papadopoulos

290B. Topics in Continuum Mechanics. (3) Three hours of lecture per week. Prerequisites: 185. The objective of the course is to present a coherent and integrated approach to the analysis of special problems, group participation in computing projects, and oral presentation. Applications to continuum mechanics and applied mathematics. (SP) Sierozhkin

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 transport and mixing, geophysical fluid dynamics, helical flows, free-surface flows in channels past an obstacle of any shape, motion of jets of arbitrary cross-section, nonlinear deformation of elastic rods and shells and flow in pipes, among others. Papadopoulos

290D. Topics in Chemical Kinetics in Reactive Flow. (3) Three hours of lecture per week. Prerequisites: 105, 106. Description of detailed chemical kinetics in perfectly stirred reactor with multiple streams, shock tubes, one-dimensional premixed flame, and one-dimensional opposed-jet flame. Principles of solving stiff ordinary differential equations. Numerical simulation and sensitivity analysis. (SP) Chen

290F. Case Studies in Fire Safety Engineering Science. (3) Three hours of lecture per week. Prerequisites: 107A, 102B or equivalent. Introduction to artificial intelligence and decision-making in fire engineering. Fundamentals of analytic design, probability theory, failure analysis, risk assessment, and Bayesian and logical inference. Applications 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) Pagni


290P. New Product Development: Design Theory and Methods. (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 teams can focus on creating cost-effective products that exceed customers’ expectations. (F) Agogino

290Q. Dynamic Control of Robotic Manipulators. (3) Three hours of lecture per week for five weeks, one hour of lecture per week for ten weeks, four hours of lecture per week for full term. Prerequisites: 230, 232, or consent of instructor. Dynamic and kinematic analysis of robotic manipulators. Sensors (position, velocity, force and vision). Actuators and power transmission lines. 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


292. Group Studies, Seminars, or Group Research. (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. Advanced studies in various subjects through special seminars on topics to be selected each year. Informal group study: special problems, comprehensive design problems, or group research on complete problems for analysis and experimentation. (F,SP) Staff

299. Individual Study or Research. (1-12) 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 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, in
tended 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 of teaching methods, educational objectives, theories of learning. The lecture and alternative approaches. Use of media resources. Student evaluation. Laboratory instruction. Curricula in mechanical engineering. Practice teaching. This course is open to Teaching Assistants of Mechanical Engineering. (SP) Hurbut

Medieval Studies

(College of Letters and Science)

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http://ls.berkeley.edu/dept/medieval/
Director: Niklaus Largier, Ph.D.
Graduate Adviser: Daniel Melia, Ph.D.

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Albert Rustioni, Ascoli, Ph.D. (Italian Studies)
Thomas Brady, Ph.D. (History)
Robert Brentano, Ph.D. (History)
Gerald Casparry, Ph.D. (History)
Carol J. Cloe-Dudley, Ph.D. (American Studies and Rhetoric)
Joseph J. Duggan, Ph.D. (French and Comparative Literature)
Mary Kay Duggan, Ph.D. (Music and Information Management and Systems)
Alan Dundes, Ph.D. (Anthropology)
Charles B. Faulhaber, Ph.D. (Spanish and Portuguese)
Ralph Heath, Ph.D. (American Studies and Comparative Literature)
David Hull, Ph.D. (French)
Niklaus Largier, Ph.D. (Near Eastern Studies and Comparative Literature)
John Lindow, Ph.D. (Scandinavian Studies)
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Daniel A. Portnoy, Ph.D. (English)
John D. Niles, Ph.D. (English)
Loren Portridge, Ph.D. (Art History and Italian Studies)
Irmengard Rauch, Ph.D. (German Studies)
Thomas F. Shannon, Ph.D. (German and Dutch Studies)
Johan P. Snyper, Ph.D. (German and Dutch Studies)
Randolph Starn, Ph.D. (History and Italian Studies)
Elaine C. Tannen, Ph.D. (German)
David H. Wright, Ph.D. (Art History)
William J. Bowser, Emeritus, Ph.D.
Louise George Clubb, Emerita, Ph.D.
Gerard Hillen, Emeritus, Ph.D.
Leonard H. Joiner, Emeritus, Ph.D.
James T. Monroe, Emeritus, Ph.D.
Charles E. Musser, Emeritus, Ph.D.
Blake Lee Spaar, Emeritus, Ph.D.
Ruggiero S. Strachan, Emeritus, Ph.D.
Frederic C. Taubach, Emeritus, Ph.D.

Associate Professors
Steven Boteelli, Ph.D. (Italian Studies)
Carolyn Dintzishen, Ph.D. (English)
Susanna Elm, Ph.D. (History and Religious Studies)
Gary B. Holland, Ph.D. (Linguistics)
Steven Justice, Ph.D. (English)
Geoffrey Miller, Ph.D. (History and Religious Studies)
Olga Kratins, Ph.D. (English)
Daniel F. Melia, Ph.D. (Rhetoric and Celtic Studies)
Ignacio E. Navarette, Ph.D. (Italian Studies and French)
Harvey Stahl, Ph.D. (Art History)

Assistant Professor
Jennifer Miller, Ph.D. (English)

Lecturers
Kathryn Klar, Ph.D. (Celtic Studies)
Annalee Rejnow, Ph.D. (Celtic Studies)

The Program in Medieval Studies

The Medieval Studies Program at Berkeley is an interdisciplinary group that coordinates and sponsors lectures, conferences, and colloquia, and promotes scholarly interests common to medievalists of different academic departments, and communicates information of interest among them. The content of the Medieval Studies Program reflects the concerns of medievalists across Berkeley, and the distinguished Visiting Professor who is in residence for either the fall or the spring semester. Normally this is a preeminent senior scholar whose permanent residence is the United States. The committee offers a joint program in which candidates have both a home department and training in the core disciplines of medieval studies.

The Joint Ph.D. Degree

Graduate students must be admitted for admission to a regular department (e.g., English or History) before applying for a joint degree in medieval studies. The degree granted is the joint Ph.D. in and medieval studies (e.g., English and medieval studies, history and medieval studies). The joint Ph.D. is designed to provide distinguished Ph.D. in fulfilling all the Ph.D. requirements of the major field of study. There are four additional requirements for the joint degree. (1) Completion of Medieval Studies 200, the graduate seminar. (2) Advanced competence in Latin, as demonstrated through either a special examination or approved course work. (3) Graduate seminars in two fields outside the student’s home department. One of these fields must be history. Students whose department is History will substitute another field in consultation with the graduate adviser. (4) A special committee for the Ph.D. qualifying examination. A representative of Medieval Studies must serve on the Ph.D. oral examinations committee.

Undergraduate Program

There is no undergraduate major. Students whose interests lie in the medieval period should consider setting up an individual major (for requirements see Earning Your Degree: A Guide for Students in the College of Letters and Science). A proposal for an undergraduate minor is pending. If approved, it will be announced on the Medieval Studies website and in the online General Catalog.

Curriculum

The program offers some of its own courses. These include Medieval Studies 200, the team taught graduate seminar, Medieval studies 150 and 250, two special topics courses taught by the Distinguished Visiting Professor; and occasional courses in Medieval Latin, paleography, and manuscript studies. In addition, students are urged to consult the medieval offerings in the department 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 Medieval Studies website web site and in the online General Catalog.

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 fifteenth weeks. In the event that the instructor is in residence for fewer than 15 weeks, the course may be offered for 2 or 3 units of credit, in proportion to the number of actual contact hours. Course may be repeated for credit. Normally taught by the Visiting Distinguished Professor of Medieval Studies. An interdisciplinary seminar, 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 in Medieval Literature. (2-5) Course may be repeated for credit. One hour of lecture per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. Basic materials and resources in fields represented in the Medieval Studies program, and in some subjects involving expertise in more than one discipline (e.g., liturgy, codicology). Emphasis on research aids and critical evaluation of their use. Staff

205. Medieval MSS as Primary Sources. (2) Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. This course explores the use of medieval manuscripts as a source for scholarship in a variety of disciplines (including literary studies, art history, music, intellectual history, social history, and canon law). After reviewing the fundamental concepts of paleography and codicology, students will compare various manuscripts using digitized images from special collections, including the Bancroft Library of UC Berkeley and the Special Collections Library of the University. Faculty members from both institutions will collaborate in teaching the course using distance learning technology. (F,SP)

210. Paleography and Codicology. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Consent of Instructor required. Instruction in Medieval Latin paleography and/or the paleography of one or more of the medieval vernacular languages of Western Europe, emphasizing the evolution of scripts and as practice in reading them. Ancillary instruction in the principles of codicology with attention to the process of text-making and book manufacture.

C241. Latin Literature of the Middle Ages. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar or workshop per week. Must be taken on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-grade basis. Prerequisites: Classic 200 or consent of instructor. Graduate students must be taking Medieval Literature in Medieval Latin and be familiar with the evolution of literary forms and genres from Late Antiquity to the close of the Middle Ages. Students who take the course for 2 units must enroll on a satisfactory/unsatisfactory basis. Students who take it for 4 units must enroll for a letter grade. Also listed as Classics C241. (F,SP)

250. Seminar in Medieval Culture. (2-4) Course may be repeated for credit. Course may be taken for 4 units on a satisfactory/unsatisfactory basis with consent of instructor. 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 Program)

Office: 111E Koshland Hall, (510) 642-5167
Chair: Steven L. Lindow, Ph.D.

Professors
Michael R. Botchan, Ph.D. (Molecular and Cell Biology)
Bob B. Buchanan, Ph.D. (Plant and Microbial Biology)
Randy W. Schekman, Ph.D. (Molecular and Cell Biology)
Douglas S. Clark, Ph.D. (Chemical Engineering)
Nicholas S. Cozzarelli, Ph.D. (Molecular and Cell Biology)
Mary K. Firestone, Ph.D. (Environmental Science, Policy and Management)
Suzanne M. J. Fleiszig, O.D., Ph.D. (Optometry)
Andrew O. Jackson, Ph.D. (Plant and Microbial Biology)
David Jenkins, Ph.D. (Civil and Environmental Engineering)
Daniel E. Koshland, Ph.D. (Molecular and Cell Biology)
Sydney G. Kustu, Ph.D. (Plant and Microbial Biology)
Terrance Leighton, Ph.D. (Molecular and Cell Biology)
Steven L. Lindow, Ph.D. (Plant and Microbial Biology)
Jerre L. Low, Ph.D. (Molecular and Cell Biology)
Terry E. Machen, Ph.D. (Molecular and Cell Biology)
Edward S. Perriello, Ph.D. (Medieval Studies and Public Health)
Daniel A. Portnoy, Ph.D. (Molecular and Cell Biology)
Leslie W. Raymond, Ph.D. (Public Health)
Jasper D. Rine, Ph.D. (Molecular and Cell Biology)
Suzanne M. J. Fleiszig, O.D., Ph.D. (Optometry)
Michael R. Botchan, Ph.D. (Molecular and Cell Biology)
Randy W. Schekman, Ph.D. (Molecular and Cell Biology)
David Jenkins, Ph.D. (Civil and Environmental Engineering)
Daniel E. Koshland, Ph.D. (Molecular and Cell Biology)
Sydney G. Kustu, Ph.D. (Plant and Microbial Biology)
Terrance Leighton, Ph.D. (Molecular and Cell Biology)
Steven L. Lindow, Ph.D. (Plant and Microbial Biology)
Jerre L. Low, Ph.D. (Molecular and Cell Biology)
Terry E. Machen, Ph.D. (Molecular and Cell Biology)
Edward S. Perriello, Ph.D. (Medieval Studies and Public Health)
Daniel A. Portnoy, Ph.D. (Molecular and Cell Biology)
Leslie W. Raymond, Ph.D. (Public Health)
Jasper D. Rine, Ph.D. (Molecular and Cell Biology)
Suzanne M. J. Fleiszig, O.D., Ph.D. (Optometry)
**Middle Eastern Studies**

**Graduate Advisers:** Mr. Brun, Mr. Portnoy, Ms. Zambrayski.

**Program Overview**

The interdisciplinary major in Middle Eastern studies (MES) provides an opportunity to study a region of historic and cultural importance whose current development is bound up with the political, economic, and cultural development of our own society. The Middle East encompasses the Arab world, Turkey, Iran, and Israel. The MES major provides students a broad and balanced course of study of the region. It gives a basic familiarity with the culture and history and the basic geographic, demographic, economic, and political characteristics, all within the course of recent political, economic, social, and cultural changes. Students will also learn about one of the major Middle Eastern languages of today. The program covers various Middle Eastern-related courses available in over 20 different departments and schools of the University. Graduates of the major have gone on to work in industry and government in the United States and abroad. 

The major is under the academic supervision of the Center for Middle Eastern Studies and its affiliated faculty members. The center organizes public lectures, publishes a newsletter once a semester, and maintains a reading room. Students are encouraged to use the center’s resources. The major is administered through the International and Area Studies Teaching Program office (IASTP). The IASTP office provides general advising on program completion, handout information on the major, including the application, and many other resources. 

MES advisers help students plan programs of study to suit their individual needs.

The MES major is not to be confused with the major in Near Eastern Studies (NES). The NES major emphasizes language and literature and includes the study of the ancient Near East. Students interested in those fields should contact the Near Eastern Studies Department in 250 Barrows Hall, (510) 642-3577.

**Major Program**

**Lower Division.** A. NES 10, Introduction to the Near East (4 units). This is a survey course introducing the fundamentals of Middle Eastern history and culture. Students must obtain written permission in advance from the MES adviser on an exceptional basis. 

**Courses in Middle Eastern Studies,** available from the Center for Middle Eastern Studies, 372 Stephens Hall, or in the Teaching Programs Office, 207 Moses Hall. The courses should be selected with a view toward developing in-depth knowledge of a particular aspect of the region. Specialized fields of study may include religious and cultural studies, history, contemporary economic development and social change, urbanization, nation building, the impact of imperialism and colonialism on the Middle East, or a topic agreed upon between the student and an MES adviser.

Occasionally, when taught by a Middle Eastern specialist, courses may address Middle Eastern issues to some extent. Depending on how the Middle East is treated, students may be permitted to use the course to fulfill a survey requirement or be incorporated into the concentration. Students must obtain written permission in advance from the MES adviser on an exceptional basis.
not include those already taken to fulfill the upper division survey requirement. The following sample programs are given purely for illustrative purposes.

**Culture and Language**

Advanced Arabic; Hebrew, Persian, or Turkish (beyond two years); Near Eastern Studies 150, Arabic Literature in Translation; Comparative Literature 120, The Bible in Western Literature; Near Eastern Studies 121A-121B, Islamic Art; History 109A-109B-109C, The Middle East.

**Middle Eastern Religions**


**Economic Development and Social Change**

Geography 101, Cultural Geography of Urban Environments; Geography 104, The City in the Third World; Political Science 142A-142B, Middle East Politics; History 109C, The Middle East from the 18th Century to the Present.

**Recommended Courses.** Strongly recommended are courses which are not necessarily Middle East-related, but which will serve to give methodological, conceptual, or comparative perspective on the Middle Eastern region. Such courses should enable students to relate their area of Middle East concentration to other disciplines and fields of study. In consultation with the adviser, students will choose courses appropriate to their own program of study. Examples of such courses are the following:

- Anthropology 158; Geography 130; Economics C171, 181; Political Science 126A-126B; Sociology C112.

**C. Senior thesis (one course).** MES 190 (1–4 units). The required senior thesis (a paper of 25-50 pages) gives students the opportunity to integrate their concentration coursework work as well as to conduct further advanced research on their chosen topic in Middle Eastern studies. To organize and guide their research and writing, students participate in a tutorial with their major advisers or with an advanced scholar approved by their advisers. The senior thesis must be completed within one semester. Students are also required to submit a copy of the thesis to the Center for Middle Eastern Studies. MES 190 must be taken for a letter grade.

**Senior honor program (optional).** MES H195A and H195B with a grade point of at least 3.3 in courses for the major and in all work completed at UC Berkeley are eligible to participate in the honors program. This is a two-semester sequence: MES H195A is for the preliminary thesis work, followed by MES H195B for thesis completion. The honors thesis (a paper of 50 pages or more) will be supervised by a faculty member appropriate to the student’s interest. Students must register for MES H195A and H195B for 1-4 units for a letter grade.

**Minor in Middle Eastern Studies**

The minor in Middle Eastern Studies is designed to introduce students to the study of the modern Middle East (the Arab, Turkic, Persian, and Israeli nation states) 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.

**MES Minor Course Requirements.** One introductory level course from the following: NES 10, History 9D, or MES 20. Five upper division courses about the Middle East selected from a pre-approved course list (A complete list is available at the IASTP office but examples include Anthropology 181, Arch 175D, History 109A-109B-109C, Poli Sci 142A-142B). Substitutions must be approved by an MES adviser.

**Completing the MES Minor.** Since the MES minor is interdisciplinary, the five upper division courses must be taken from at least two departments. The study of modern Middle Eastern languages is encouraged, however, no language requirement for the MES minor, nor may 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, 98, 99, 197, 198, and 199 may not be used to fulfill minor requirements. At least three of the upper division minor courses must be at UC Berkeley (all courses must be approved by an advisor.) Students must achieve a minimum overall GPA of 2.0 in the courses used to satisfy minor requirements.

**Requirements of the MES Minor.** Students must achieve a minimum overall GPA of 2.0 in courses for the major and in all work completed at UC Berkeley. (All transfer courses taken to satisfy the MES minor must total at least 3.3 in courses for the major and in all work completed at UC Berkeley are eligible to participate in the honors program. This is a two-semester sequence:

- 20. 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 and admission preference is given to lower division students and prospective Middle Eastern majors. (SP) Michalak

**98. Directed Group Study for Lower Division Students.** (1-4) Course may be repeated for credit with different instructor. Three hours of lecture and one hour of laboratory per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Seminar for the group study of selected Middle Eastern related topics not covered by regularly scheduled courses. A written proposal must be approved by a Middle Eastern Studies faculty adviser. Final paper required. Units determined on consultation with instructor. (F,SP)

**190. Supervised Independent Study and Research.** (1–4) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. For students wishing to pursue an interest not represented in the curriculum by developing an individual program of study and research supervised by a faculty member. A written proposal must be approved by a Middle Eastern Studies faculty adviser. Final paper required. Units determined on consultation with instructor. (F,SP)

**Military Officers’ Education Program (ROTC) (Special Studies)**

**Offices:** See following listings for Aerospace Studies, Naval Science, and Naval Sciences.

**Chair, Advisory Committee on ROTC:** Thomas G. Barnes, D.Phi.

**Adjunct Professors:**
- Bryan S. Berg, M.S., Lieutenant Colonel, U.S. Army
- William P. Croft, M.A., Captain, U.S. Navy
- Wayne I. Mudge, M.S., Colonels, U.S. Air Force

**Associate Adjunct Professors:**
- Daniel J. Brown, M.S., Major, U.S. Air Force
- Kenneth N. Firoved, M.A., Lieutenant Colonel, U.S. Marine Corps
- Jonathan Katz, M.S., Major, U.S. Army Reserve

**Adjunct Assistant Professors:**
- Paul V. Aquavella, B.S., Lieutenant, U.S. Navy
- Colette L. Amsussen, M.S., Captain, U.S. Air Force
- George L. Dieud, M.A., Captain, U.S. Army Reserve
- Derek J. Purdy, B.S., Lieutenant, U.S. Navy

**Lecturer:**
- Bruce B. Bolla, B.S., Major, U.S. Air Force Reserve

**Program Overview**

The Military Affairs Program comprises the three distinct military officers’ commissioning programs: Air Force ROTC, Army 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. Although these core courses are expressly designed to serve ROTC candidates, they are open to all students. Students who want to complete the Military Officers’ Education Program and earn commissions in any of the military services should consult the program advisors in the appropriate unit.
Military Affairs

Lower Division Courses

2. The Military in American Society. (3) Two hours of lecture and one hour of discussion per week. An introduction to the military profession, with emphasis on the relationships between the military institution and its relationship to the individual, the government, and the society. Investigates the need for national defense and studies the causes of war. (F,SP) Staff

20. Evolution of Warfare. (3) Three hours of lecture per week. Progressive analysis of the evolution of warfare from the prehistoric period to the present. Emphasis 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) Firoved

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. The Berkeley 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. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP) Staff

Upper Division Courses

120. The Evolution of American Warfare: 1607-1900. (3) Three hours of lecture per week. Historical analysis of American theory of warfare from colonial period and Revolution through Spanish American War. Social, economic, and political influences are examined, tracing the evolution of the American military. Effects of institutions on organizational structures, technology, and the practice of warfare are emphasized. (F) Staff

121. The Evolution of American Warfare: 1900-1980. (3) Three hours of lecture per week. Military history of World War I and II, survey of modern revolutionary warfare. Influence of modern technology on American military organizations. The development of a global military strategy, imprint of the social fabric of the nation on the military as the United States evolved into a world power. Examination of historical theorists on revolutionary warfare in its contemporary form. (SP) Staff

123. Korea, Vietnam and the American Military Experience. (3) Two hours of lecture and one hour of discussion per week. This course examines recent military warfare 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) Staff

144. Military Law, Ethics, and Professionalism. (2) Two hours of lecture per week. Topics to be analyzed and discussed include the court-martial system, the punitive articles of the Uniform Code of Military Justice, fundamental rights of accused persons, rules of evidence, punishment, administrative boards, and the Law of War. Survey of ethical and professional issues of the Military. (SP) Staff

145A. National Security Forces in Contemporary American Society. (3) Three hours of seminar per week. Prerequisites: Upper division course. This course conceptually examines the Armed Forces as an integral element 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) Hodges

145B. Preparation for Active Duty. (3) Three hours of lecture and for cadets only, a two-hour advanced leadership laboratory per week. Prerequisites: Upper division standing and consent of instructor. This course focuses on the commissioning of cadets and their transition to active duty. The primary focus of instruction is officerhood, professionalism, and leadership. Topics for specific discussion include the military justice system, military ethics, core values, military professionalism and current issues affecting the Air Force, and 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) Mudge

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 efforts to project seapower ashore. A case study approach is used to study developments in amphibious warfare. (F) Firoved

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 the instructor. Supervised in-depth study and research for undergraduate students who desire to pursue topics of their own selection. (F,SP) Staff

Aerospace Studies (Air Force ROTC)

Department Office: Hearst Gymnasium, (510) 642-3572
http://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 with special emphasis on university students. The Air Force offers undergraduate and graduate degree requirements. Two accredited AFROTC programs are available. Entering freshmen may elect the general military course or, for students who have at least two full academic years remaining in their degree program, the department offers a two-year professional officer course.

Students interested in the general military course are eligible for a small-seminar setting. Upon completion they cover the costs of tuition, books, and most fees; also a $200 per month living allowance is paid to each student on the college scholarship. Freshmen and sophomores competing for scholarships should contact the department.

Students not taking 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 degree program. Selection for the professional officer course is based on such factors as aptitude, interest, college grades, and performance at a five-week field training camp. Students enrolled in the AFROTC program are provided uniforms, textbooks, and a $200-per-month allowance while they are active in the program. Normally, 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-year and the four-year AFROTC programs emphasize student participation and involvement. Classes are conducted as seminars and call for active student discussion. In addition, there is a two-hour leadership laboratory that is mandatory for all AFROTC cadets. In this laboratory, students become involved in the management of their own cadet organization. Students also participate in projects, visits to Air Force bases, and orientation flights.

Completion of the program to earn an Air Force commission requires enrollment during each semester in a specified course in Aerospace Studies or Military Affairs. The normal sequence for the four-year program is as follows: AS 1, MA 24, AS 2, AS 135A, AS 135B, MA 145A, MA 145B. Students enrolled in the two-year program need only take the upper division courses. All courses count for credit.

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 University Extension.

For further information on enrollment requirements and procedures, contact the department staff at (510) 642-3572.

Lower Division Courses

1. The U.S. Air Force and National Security. (1) One and one-half hours of lecture/discussion per week. Introductory survey of the U.S. Air Force. Explores evolutionary factors affecting the nature and control of the military. Examines current U.S. defense needs and the Air Force in terms of theory, function, and organizational structure. Students majoring in non-military disciplines are examined individually. (F) Mudge

2. Development of Air Power. (2) Two hours of lecture per week. Formerly 2A. This course focuses on milestones in the development and employment of air power leading to its growth as a primary element of national security. Key historical events, leaders, and technological advances from 1865 to the present are covered. The course combines lectures and discussion as well as student oral and written presentations. (F) Mudge

3. Leadership, Ethics, and Values. (1) One hour of lecture per week. This course focuses on basic leadership principles and characteristics, the importance of followership, and the implications of ethical behavior. While lecture presentation is primarily lecture, students will also participate in group leadership exercises. Student development of oral and written communication skills is also stressed. (SP) Hodges

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. The Berkeley 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. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (SP) Hodges

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. Training session supports cadet classroom training. It consists of basic knowledge and practical command and staff leadership experiences in preparation for active duty as military officers. This course focuses on the leadership experiences of mid and upper command levels and provides military knowledge and skills to younger cadets. The main focus of this training is on proper uniform wear, grooming and appearance requirements, physical fitness, knowledge of the various military customs and courtesies, as well as a working knowledge of military drill and ceremony. This course is totally cadet-centered to maximize the leadership experience and prepare cadets to make an easy transition to their active duty assignments. (F,SP) Asmussen

135A-135B. Air Force Leadership Studies. (3,3) Three hours of lecture/discussion per week. Prerequisites: 135A is a prerequisite to 135B or 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 are included. Students are provided knowledge and skills primarily through assignments and oral presentations. (F) Asmussen

Professional Courses

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 aviation regulations, the flight environment, aircraft systems and performance, basic meteorology, navigation, aviation physiology and comprehensive flight planning. (SP) Mudge

**Military Science (Army ROTC)**

Department Office: Hearst Gymnasium, (510) 643-7505  
http://ls.berkeley.edu/dept/mlsci/index.html

The Army Officer Education Program offers a variety of credit courses focused on the study of the military as an institution, adventure training opportunities, and a program of laboratory work in practical military skills. The program provides an opportunity to examine service in the Army while earning a baccalaureate degree. A student who completes the program may earn a commission in the Regular Army, Army Reserve, or National Guard.

Graduate or undergraduate students can complete the Military Science requirements through a four-year, three-year, or two-year program. The following courses during their junior and senior years are open to all University students. From other area institutions may participate in the Army ROTC program through cross-enrollment arrangements or through University Extension.

For more information concerning Army ROTC or the Department of Military Science, contact the staff at Hearst Gymnasium or call (510) 643-7505, ext. 127.

**Lower Division Courses**

1. **Leadership Laboratory.** The laboratory may be taken for eight semesters. Two hours of instruction and practical application in leadership and associated military skills. Must be taken on a pass/no pass basis. The instruction includes organization and management of military units, physical training, drill and ceremonies, land navigation techniques, survival skills, and extensive first aid training. (F,SP) Staff

2A-2B. U.S. Army and National Security. (1,1) One hour of lecture per week. Introductory survey of the U.S. Army. Explores evolutionary factors affecting the nature and control of the military. Examines current U.S. defense needs and the Army in terms of function, mission, organizational requirements, and military education. Consideration is also given to the structure and missions of NATO and the structure, equipment, and operational doctrine on the Soviet Army. (F,SP) Staff

**Upper Division Courses**

100. Army Management and Leadership. (2) Two hours of lecture/discussion per week. Prerequisites: Upper division standing and consent of instructor. A practical interdisciplinary approach to contemporary civilian and army management. Military leadership is examined with an emphasis on increasing the student’s professional effectiveness on an individual, group, and organizational basis. Topics include interpersonal and organizational communication, problem solving and decision making. Staff

**Professional Courses**

430A-430B. Fundamentals of Terrain Representation and Military Operations. (3,3) Three hours of lecture and two hours of laboratory per week. Prerequisites: Consent of instructor; 430A is prerequisite to 430B.

A. Introduces the categories and uses of topographical maps, the military grid reference system, map symbols, overlays, intersection, resection, and terrain association. U.S. Army small-unit tactics will be introduced. Topics include operation orders, troop leading procedures, preparation for combat, individual tactical techniques, tactical movement, and battle drills.

B. Devoted to applying the navigational techniques and small-unit tactics learned in 430A to more complex scenarios. Topics include patrolling, squad/platoon offense and defense, squad/platoon sector sketches. Pertinent leadership issues will also be addressed. (F,SP) Staff

**Naval Science (Naval ROTC)**

Department Office: 152 Hearst Gymnasium, (510) 643-3551  
http://ls.berkeley.edu/dept/navsci/intro.html

The Department of Naval Science offers several programs of instruction and training 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 University 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, NS 2, NS 3, and NS 10.

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 642-3551.

3. **Tweeddale Scholarship Program:** This program provides NROTC Navy scholarships specifically for students 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 social/term of college/advanced placement or IB 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 642-3551.

4. **NROTC Four-Year Scholarship Program:** Open to physically qualified men and women between the ages of 17 and 23, with the same active duty age waiver possible as above. Participants receive uniforms, Naval Science books, and $200 per month stipend in their junior and senior years. 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 is not incurred until the third year of the junior year in the four-year college program.) Scholarships may be offered to highly qualified college program students.

5. **NROTC Two-Year Scholarship Program:** Open to physically qualified men and women who will be entering their junior year (or their third year in a five-year curriculum). U.S. citizenship is required. One year of calculus is required before entrance into the program. Two-year scholarship students must not reach their 25th birthday before June 30 of the year in which graduation and commissioning are anticipated. Waivers to age 29, however, are possible for prior service. Candidates for the two-year scholarship attend a six-week summer 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 $200 per month during their last two years in college. 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.
Naval Science Institute in Newport, Rhode Island, during the summer before their junior year. Graduates of Naval Science Institute enroll in the NROTC unit as juniors and receive uniforms, Naval Science books, and $2,500 per month stipend in their fourth year in college. Some summer training 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) Two hours of lecture/discussion per week. This course provides guidance in student involvement in the 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 duties of a junior officer, 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) Rosenblatt

2. Sea Power and Maritime Affairs. (2) Two hours of lecture per week. Prerequisites: Consent of instructor. Traces the U.S. historical evolution of sea power, its concepts, theories and applications. Emphasizes the intimate relationship between national strategy, changing technology, and naval leadership on the evolving concept of sea power. Relates historical developments to current trends. Examines briefly the U.S. Merchant Marine and the role of the Soviet Navy's impact on sea power policy formulation. (SP) Firoved

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, understand the impact of competition, identify the limits of ability, and plan and forecast in a task-centered organization. The course includes exposure to measures of organizational effectiveness, methods to overcome resistance to change, effective communications, and techniques to aid in counseling, team building, and resolution of disciplinary and personnel matters. (SP) Firoved

10. Naval Ship Systems I. (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 combination of these systems to perform detection and analysis of a range of traversing common environments. (F) Acquavella

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 combination of these systems to perform detection and analysis of a range of traversing common environments. (F) Acquavella

412. Leadership and Ethics. (3) Three hours of lecture/discussion/seminar per week. Prerequisites: Consent of instructor. This course is the capstone leadership course. It is intended to provide the ethical foundation and tools required for success as a leader of a diverse work force, often under circumstances of substantial stress. The course is divided between the art of leadership and the technical aspects of integrating personnel development with the management of resources, although the emphasis is on leadership. It is designed to be given as a seminar or lecture/discussion in which principles, concepts, and concrete subjects are presented, discussed, and debated. (SP) Rosenberg

Molecular and Cell Biology

College of Letters and Science

Department Office: 597 Life Sciences Addition
Undergraduate Affairs Office: 2083 Valley Life Sciences Bldg. (VLSB), (510) 643-8895
Graduate Affairs Office: 341 Mulford Hall, (510) 642-6252
Purdue, Illinois, Berkeley, Stanford, California.

William M. Hahn, Ph.D. University of California, Berkeley. Developmental biology, tumor virology, single molecule manipulation

Carlos J. Bustamante, Ph.D. University of California, Berkeley. Physical biochemistry, biophysics, methods of single molecule manipulation

Richard Calendar, Ph.D. Stanford University. Molecular genetics of viruses

W. Zachues Cande, Ph.D. Stanford University. Cell and developmental biology

Thomas Cline, Ph.D. Harvard University. Sex determination in Drosophila

Nicholas R. Cozzarelli, Ph.D. Harvard Medical School. DNA replication and recombination

Peter D. Duesberg, Ph.D. University of California. Genetic and viral genetics

Gary L. Firestone, Ph.D. University of Iowa. Molecular endocrinology, tumor biology

John G. Forte, Ph.D. Pennsylvania University. Membrane proteins, transport and energetics

Walter J. Freeman, M.D. University. Neuropsychology, neurophysiology, nonlinear brain dynamics

John Gerhart, Ph.D. University of California. Developmental biology

Robert Glaser, Ph.D. University of California, Berkeley. Membrane proteins, structural biology

Donald A. Glaser, Ph.D. California Institute of Technology. Psychophysics of vision

Alexander N. Glazer, Ph.D. University of Utah. Molecular and cellular immunology

Corey Goodman, Ph.D. University of California, Berkeley. Developmental neurobiology

Richard M. Harland, Ph.D. Cambridge University. Molecular biology of development

Jack F. Kirsch, Ph.D. Rockefeller University. Enzymology, site-directed mutagenesis

Judith P. Klinman, Ph.D. University of Pennsylvania. Biochemistry and biophysical chemistry; molecular biology

Daniel E. Koshland, Jr. Ph.D. University of Chicago. Molecular biology, neurobiology, enzymology

Harold L. Kornberg, Ph.D. Stanford University. Neuropsychology, excitable membranes

Terrance Leighton, Ph.D. University of British Columbia. Microbial, molecular and developmental genetics

Michael S. Levine, Ph.D. Yale University. Drosophila pattern formation, development

Stuart M. Linn, Ph.D. Stanford University. Enzymology of bacterial metabolism

Terry E. Machen, Ph.D. University of California at Los Angeles. Epithelial transport, cellular and molecular physiology/biology

Michael A. Marietta, Ph.D. University of California, San Francisco. Chemical and electromagnetic wave generation and propagation; the design and use of electronic, electromechanical, and pneumatic systems; and the combination of these systems to perform detection and analysis of a range of traversing common environments. (F) Acquavella

Nicholas R. Cozzarelli, Ph.D. Harvard Medical School. Membrane biology, bacterial pathology

George F. Oster, Ph.D. Columbia University. Mathematical biology in cell and developmental biology

W. Geoffrey Owen, Ph.D. Imperial College, London. Membrane biophysics, retinal neurophysiology

Edward E. Penhoet, Ph.D. University of Washington. Seattle. Macromolecular synthesis control mechanisms and the biology of RNA viruses

Mu-Ming Poo, Ph.D. Johns Hopkins University. Nerve growth, synapse formation and function

Daniel A. Poritz, Ph.D. University of Washington. Molecular basis of host-parasite interactions

David Rault, Ph.D. Massachusetts Institute of Technology. Molecular biology of viruses

Jasper R. D. Rome, Ph.D. Oregon Gene technology, nuclear biology

Donald R. Shih, Ph.D. University of California, Berkeley. Molecular genetics

Gerald M. Rubin, MacArthur Professor, Ph.D. California Institute of Technology. Molecular genetics, molecular neurobiology

Howard K. Schachman, Ph.D. Princeton University. Physical biochemistry

Randi W. Schickman, Ph.D. Stanford University. Organelle assembly, protein transport

Nalini Shah, Ph.D. All India Institute of Medical Sciences, New Delhi. Cellular and molecular biology

Richard A. Steinhardt, Ph.D. Columbia University. Cellular and developmental biology

Jeremy Thorner, Ph.D. Harvard University. Biochemistry, cell biology, tumor virology

Robert Tjian, Ph.D. Harvard University. Eukaryotic molecular biology, biochemistry

David A. Weisblat, Ph.D. California Institute of Technology. Developmental biology

Frank S. Wilbur, Ph.D. Johns Hopkins University. Neurophysiology of vision

* Donald W. Weatherheimer, Ph.D. R.S. Ohio State University. Neurobiology, psychophysics

Fred H. Wilt, Ph.D. Johns Hopkins University. Molecular endocrinology and cell biology

Jeffery A. Winer, Ph.D. University of Tennessee. Neuroanatomy, comparative neuroscience

Arist Tari, Ph.D. University of California. Institute of Molecular biology, tumor virology of T cell development

Robert J. Zuckerkandl, Ph.D. Stanford University. Cellular neuroscience, synaptic biochemistry

David Zuzman, Ph.D. University of California, Los Angeles. Microbial development

Edward L. Alper (Emeritus), Ph.D. University of California, Berkeley. Radiation biology, carcinogenesis

*Professor of the Graduate School

Recipient of Distinguished Teaching Award

AC suffix=course satisfies American cultures requirement

B prefix=language course for business majors

C prefix=course is cross-listed course

H prefix=honors course

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. The Berkeley 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. Berkeley seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP) Staff
The MCB honors program offers exceptional 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 the two-year honors program in research including 4 of 8 upper division MCB courses;
2. Have a cumulative Berkeley grade-point average of at least 3.3 in all work completed at Berkeley;
3. Have at least a 3.5 grade-point average for all MCB major requirements; OR 3.5 in all upper division MCB courses;
4. Present their research in an approved forum, such as an MCB symposium, the Undergraduate Poster Session, or other scientific meeting;
5. Write an honors thesis approved by an MCB faculty sponsor. Additional information on H196 and receiving honors is available in the Undergraduate Affairs Office.

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 methods and concepts of the study of the molecular structures and processes of cellular life. The training is intellectually focused, but at the same time offers unusual opportunities for varied disciplinary specialization. Undergraduate preparation for admission to the program should correspond to one of the two plans of the department undergraduate major detailed here. Students working for the Ph.D. will be required to serve as a graduate student instructor for two semesters during the first three years. Students seeking detailed information about such matters as admission, curriculum, and sources of financial support should visit our web site at http://mbc.berkeley.edu or contact the department by mail at Graduate Affairs Office, Department of Molecular and Cell Biology, University of California, Berkeley, 401 Barker Hall #3200, Berkeley, CA 94720-3200. E-mail: mcbbao@uculin4.berkeley.edu.

Research Facilities

The Cancer Research Laboratory is a research institute on the Berkeley campus that carries on a research, teaching, and service program designed to support interdepartmental 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 an 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 three research facilities: 1) Microbial Facility for synthesis and analysis of nucleotides, peptides, and proteins; 2) Flow Cytometry Facility for fluorescence-activated cell sorting and analysis; and 3) Transgenic Facility for production of transgenic mice 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.

The 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. In particular, this research facility provides the infrastructure and technologies for the performance of RNA microarray experiments, which allow the analysis of mRNA expression from tens of thousands of genes at a time. The Functional Ge-
nomics. Laboratory currently possesses all the equipment necessary for conducting DNA microarray experiments, including thermal cyclers, fluidics robots, microarray printing robots, laser scanning microscopes for microarray scanning, and computers for data analysis and storage of informatics databases.

The Robert D. Ogg Electron Microscope Labo-

ratory is an instructional and research unit of the College of Letters and Science. It houses equip-
mence for electron microscopy (TEM) and scanning electron microscopy (SEM). The staff is skilled not only in the operation and maintenance of instruments but in standard and most specialized techniques of electron preparation. Qualified under-
dergraduates and graduate students, postdoctoral associates, faculty, and research staff in biological and physical sciences, once trained, may make use of the instruments in research. Instruction is provided in the form of both classes and individual training. Training is provided as MCB 481B and/or 481C. Registered students and faculty are not charged for training. Nominal charges are made for use of the laboratory for individual re-
search work. With permission from the director, non-UC personnel can be accepted for training or laboratory work by special arrangement outside normal hours. The laboratory provides demonstra-
tions of the electron microscope and prepara-
tions for on-campus classes and can make special arrangements for tour groups.

Other specialized research facilities include those for x-ray crystallography, nuclear magnetic reso-
nance studies, large-scale fermentation, and pro-
duction of oligonucleotides.

Division of Biochemistry and Molecular Biology

Head: Michael Botchan

Lower Division Courses

11. Of Molecules and Man: A View for the Layman. (3) Students will receive no credit for 11 after taking Biology 1A, 11; Chemistry 3A-3B, 10 or 112A-112B, 112H. Three hours of lecture and one hour of discus-
sion per week. Examination of molecular mechanisms that underlie normal functions of living organisms and in ways in which those functions are disrupted by med-
cal disorders and environmental agents. Designed to provide non-biologists with an understanding of mod-
ern biochemistry and the ways we control and alter the 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 will be foundational to funda-
mental biological strategies. Graduate students addi-
tionally should enroll in C216, Microbial Diversity Work-
shop. (SP) Staff

Graduate Courses

200. Advanced Biochemistry and Molecular Bio-
chemistry. (3) Three hours of lecture and one hour of dis-
cussion per week. Prerequisites: 110 or equivalent. General course for first-year graduate students. Recent advances in the study of molecular biology and ge-
genetic characteristics of prokaryotic and eukaryotic cells and their viruses, macromolecular syntheses, regula-
tion of gene expression, chromosome organization, and cell differentiation. (F) Staff

205. The Chemistry, Biochemistry, and Physical Biochemistry. (3) Three hours of lecture per week. Prerequisites: 110 or 102. Formerly 112. Three hours of laboratory per week. Prerequisites: Plant Bio-
chemistry C112. (F) Hofmeister

211. Introduction to Structural Biochemistry. (3) Three hours of lecture per week. Prerequisites: 100 and Chemistry 130A. This course for upper division majors will teach principles of protein and nucleic acid struc-
tures and outline basic experimental methods for con-
formational and functional studies. The classical problems of struc-
tural biology, as well as new approaches and methods, will be emphasized. (SP) Alber, Marqusee

212. General Microbiology. (3) Three hours of lec-
ture per week. Prerequisites: 100 or 102. Formerly 112. This course will explore the mollecular mechanisms for physiology and biochemical diversity among mem-
bers of the two major domains, Bacteria and Archaea. The ecological significance and evolutionary origins of this diversity will be emphasized. This is the laboratory course for C112. The primary emphasis in the lab-
oratory will be on the observation, cultivation, and characteri-
ization of bacteria and archaea. Laboratory exercises will include the enrichment and isolation of bacteria and archaea from various environments. Also listed as Plant Biology C112. (F) Hofmeister

C112L. General Microbiology Laboratory. (1) One hour of laboratory per week. Prerequisites: Plant Bio-
chemistry C112 (may be taken concurrently). Experimental tech-
niques of microbiology designed to accompany the lecture in C112. The primary emphasis in the lab-
oratory will be on the observation, cultivation, and characteri-
ization of bacteria and archaea. Laboratory exercises will include the enrichment and isolation of bacteria and archaea from various environments. Also listed as Plant Biology C112L. (F) Kustu

113. Applied Microbiology and Biochemistry. (2) Two hours of lecture per week. Prerequisites: 112 or consent of instructor. A survey of modern develop-
ments emphasizing the application of the knowledge of fundamental microbiology to industrial processes. Topics include production of metabolites, enzymes, and single-cell proteins; genetic manipulation of micro-
organisms; recovery of minerals; and energy pro-
duction. (SP) Leighton, Nikiad

C114. Introduction to Comparative Virology. (4) Three hours of lecture, one hour of discussion per week. Prerequisites: Intro-
ductive chemistry (1A or 3A-3B or equivalent) and in-
troductory biology (1A-1B or equivalent) and general biochemistry (100 or equivalent)—preferably completed but may be taken on an "emergence" basis. Prerequisites will be con-
sidered as infectious agents of bacteria, plants, and animals (vertebrates and invertebrates). Several fam-
ilies of viruses will be compared with respect to bio-
chemical, structural and morphological properties, and genetics. The course will also include some aspects of the evolutionary development of the many bio-
homologous types of microbial organisms, both procaryote and eucaryote, using a phylogenetic framework to or-
ganize the concept of "biodiversity." Emphasis will be placed 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 will be foundational to funda-
mental biological strategies. Graduate students addi-
tionally should enroll in C216, Microbial Diversity Work-
shop. (SP) Staff

216. Microbial Diversity. (3) Three hours of lecture per week. Prerequisites: Upper-division standing, 112 or consent of instructor and organic chemistry (may be taken concurrently). Formerly 116. This course for up-
per division and graduate students will broadly survey the various types of microbial organisms, both procaryote and eucaryote, using a phylogenetic framework to organize the concept of "biodiversity." Emphasis will be placed 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 will be foundational to funda-
mental biological strategies. Graduate students addi-
tionally should enroll in C216, Microbial Diversity Work-
shop. (SP) Staff

220. Advanced Biochemistry and Molecular Bio-
chemistry. (3) Three hours of lecture and one hour of dis-
cussion per week. Prerequisites: 110 or equivalent. General course for first-year graduate students. Recent advances in the study of molecular biology and ge-
genetic characteristics of prokaryotic and eukaryotic cells and their viruses, macromolecular syntheses, regula-
tion of gene expression, chromosome organization, and cell differentiation. (F) Staff

225. The Chemistry, Biochemistry, and Physical Biochemistry of Nucleic Acids. (3) Three hours of lec-
ture and one hour of discussion per week. Prerequi-
sites: One year of biochemistry and a course in phys-
ical chemistry. Primary, secondary, and tertiary struc-
tures of nucleic acids, and methods used for structural analysis. Thermodynamics and kinetics of structural transitions. Theories of ligand interactions with nucleic acids, and analysis of those interactions and their effects on nucleic acid structure, reactivity, and stability. (SP) Staff

226. Physical Biochemistry. (3) Three hours of lec-
ture per week. Prerequisites: Year courses in organic chem-
istry and physical chemistry. 100 recommended. Application of modern experimental methods to the analysis of the structure, func-
tion, and interaction of large molecules of biological interest. (F) Marqusee, Alber, Handel

C210. Dietary Determinants of Cancer, Heart Dis-
ease, and Aging. (3) Three hours of lecture per week. Prerequisites: 100 or equivalent. Consent of instructor. The influence of diet on DNA damage, can-
cer, and aging will be discussed with an emphasis on micronutrient deficiencies as a major contributor to DNA damage, cancer, and aging. The influence of diet on atherosclerosis will be covered with an emphasis on the role of dietary constituents pro-
posed to have either toxic or preventive effects in the ar-
tery wall. Readings will consist of papers from the lit-
erature. Also listed as Nutritional Sciences C210. (SP) Ames

211. An Introduction to Structural Biology and Physical Biochemistry. (3) 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 211 and 212 are taught concurrently. Students enrolled in 212 will be required to attend a weekly discussion section and to prepare a mini-project proposal. (SP) Alber, Marqusee

C214. Protein Chemistry, Enzymology, and Bioorganic Chemistry. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. The topics covered will be chosen from the following: protein structure, denaturation, and folding; RNA catalysis; protein-protein and protein-nucleic acid interactions; and mechanisms of action of antibodies. Intended for graduate students in chemistry, biochemistry, and molecular and cell biology. Also listed as Chemistry C230. (SP) Botchan, Penhoet

215. Molecular Biology of Animal Viruses Workshop. (1) One hour of workshop per week. Prerequisites: Graduate standing or consent of instructor. This workshop for graduate students will parallel 115 which should be taken concurrently. Emphasis in the workshop will be on the review of a current research paper of the current week. A formulation of a seminar and/or paper relevant to this topic will be required. (SP) Botchan, Penhoet

C216. Microbial Diversity Workshop. (1) One hour of workshop per week. Prerequisites: Graduate standing or consent of instructor. (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 the review of current research literature and formulation of paper pertinent to research in microbial diversity. (SP) Staff

217A-217C. Selected Topics in Biochemistry and Molecular Biology. (1;1;1) Course may be repeated for credit with change in contents. Three hours of lecture per week 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 are taught in tandem 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. Review of current literature and discussion of original research. (F,SP)

218A. Bacterial Viruses. (2) Initiation of DNA replication. The mechanism of DNA packaging and interference between viruses, bacterial cloning, and the heat shock response. (F,SP) Calendar

218B. Molecular and Developmental Genetics of Bacillus subtilis. (2) Molecular genetic regulation of transcription, translation, and developmental gene expression in Bacillus subtilis. Leighton

218C. Malignant Transformation. (2) Malignant transformation by retroviruses and the role of protein phosphorylation in growth regulation. Martin

218D. DNA Structure and Function. (2) DNA structure and function. Cozzarelli

218E. Viruses as Models for Eukaryote Gene Expression and Replication. (2) Recent developments in eukaryote viral and cellular regulation. New concepts in transcription, translation, and RNA replication, with particular emphasis on virus-cell interactions. Botchan

218F. Protein Structure and Design. (2) Design of proteins using a combination of experimental and computational techniques. Determination of protein structure by nuclear magnetic resonance (NMR). Handel

218G. Mycobacterial Development. (2) Review of current literature and discussion of original research. Zuman

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 natural carcinogenesis. Working group format with critical review of the current research. Dueber

218K. Channel-Forming Membrane Proteins. (2) Structure, functional properties, and assembly of assemblies that form nonspecific and specific passive diffusion channels, as well as active transport apparatus, in bacterial membranes. Handel

218N. Eukaryotic Transcriptional Control. (2) Nucleic acid and protein components involved in regulating gene expression from eukaryotic chromosomes. Kane

218P. Physical Optics and Crystallography. (2) A combination of didactic presentations and informal discussions of methods and theory in physical optics and diffraction, as applied to crystallography of biological macromolecules. Emphasis on new developments, with the development of suitable background. Glaser

218Q. Structural Biophysics. (2) Structural biology with emphasis on proteins and nucleic acids, cell membranes, cytoskeletal and motile systems, and the protein folding problem. Glaser

218R. The Protein Folding Problem. (2) Protein structure, stability, design, and the pathway of protein fold- ing. Marqusee

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

218T. Post-transcriptional Control in Saccharomyces Cerevisiae. (2) Prerequisites: Consent of instructor. Poly A tail recognition by translation and degradation enzymes in the yeast cell. Sachs

218U. Protein Folding and Stability. (2) The connection between the sequence of a protein and its three-dimensional structure. Volkman

218W. Enzyme Catalysis. (2) Fundamental aspects of enzyme catalysis, as probed by kinetic, spectroscopic, and molecular biological approaches. Kliman

218Z. Baculoviruses. (2) Prerequisites: Consent of instructor. Insect host-virus interactions at the organismal and cellular levels with emphasis on pathogene- sis, host range factors, and the role of the activator cytoplasm in virus infection and replication. Review of literature and discussion of original research. Volkman

219. 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. Review of current literature and discussion of original research. (F,SP)

219A. Assembly of Eukaryotic Chromosomes. (2) Biochemical and genetic characterization of proteins that assemble histones onto DNA. Analysis of the relation- ship of chromatin assembly to DNA replication and gene expression. Kaufman

219B. Enzyme Mechanisms. (2) Prerequisites: Consent of instructor. Enzyme mechanisms. Kirsch

219C. Regulatory Enzymes. (2) Prerequisites: Consent of instructor. Biosynthesis, structure, activity, assembly, and interactions of allosteric proteins. Schekman

219D. DNA Enzymology. (2) Prerequisites: Consent of instructor. Enzymology of DNA repair, replication, re- striction, recombination, and methylation. Linn

219E. Regulation of Gene Transcription. (2) Prereq- uisites: Consent of instructor. The mechanism of reg- ulation of gene functions, particularly at the level of genetic transcription. Chamberlin

219F. Eukaryotic Gene Expression. (2) Prerequisites: Consent of instructor. Protein-DNA interactions and the control of gene expression in eukaryotes. Tjian

219G. Mutagen Detection. (2) Prerequisites: Consent of instructor. Mutagenesis and carcinogenesis. B. Ames

219H. Molecular and Cell Biology of Listeria monocytogenes Pathogenesis. (2) Discussion of recent re- search on the genetics, cell biology, and immunology of the model facultative intracellular bacterial pathogen, Listeria monocytogenes. Portnoy

219K. Eukaryotic Transcription and Chromosome Structure. (2) Prerequisites: Consent of instructor. Re- lationships among transcription, chromatin, and chro- mosome structure. Dunaway

219M. Regulatory Substances in Bacteria. (2) Prerequisites: Consent of instructor. Bacterial regulation. B. Ames

219N. Chemotaxis. (2) Prerequisites: Consent of instructor. Bacterial chemotaxis as a model sensory sys- tem. D. Kosher

219P. Secretion and Cell Membrane Assembly. (2) Prerequisites: Consent of instructor. Cell surface growth with emphasis on the unicellular eukaryote S. cerevisiae. Schekman

219Q. Structural Biology of Molecular Machines. (2) Crystallographic and biochemical studies of assembly 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, and inhibition of gene expression, and the biochemical basis of signal desensitization and physiological adaptation, with strong emphasis on genetic and molecular analysis of these systems, especially in the yeast Saccharomyces cerevisiae. Thorne

219U. Single Molecule Biophysics. (2) Methods of single molecule manipulation and visualization that are used to characterize the structure and mechanism of processes for nanoscale machines, such as RNA polymerase and to investigate the me- chanical denaturation of single proteins will be covered in research reports and reviews of the current literature in this field. Buxanto

219W. Cyanobacterial Physiology and Biochemistry. (2) Prerequisites: Consent of instructor. The physiol- ogy, cell structure, biochemistry, and molecular biology of the cyanobacteria (blue-green algae). Glazer

219X. Cell Surface Glycoconjugate Interactions. (2) In- vestigations 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) Regu- lation of HIV gene expression by viral proteins and cellu- lar cofactors will be covered 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) Em- phasizes a study of the replication of eukaryotic telomeric DNA. Special focus on techniques in protein bio- chemistry and molecular biology. Collins

Division of Cell and Developmental Biology

Head: G. Steven Martin

Lower Division Courses

Biology 1A. General Biology. (4) Three hours of lec- ture, three hours of laboratory, and one hour of dis- cussion. (3) Three hours of lecture, three hours of laboratory, and two hours of discussion. (3) Two semesters of intro-ductory chemistry, either Chemistry 1A-1B or 1A and 1A. Concurrent enrollment in Chemistry 3B is recom- mended. General introduction to cell structure and function, molecular and organism genetics, animal de-
development, form and function. Intended for students majoring in the biological sciences, but open to all qualified students. Students must take both Biology 1A and 1B to complete the sequence. Neither is a prerequisite to the other. Sponsored by Molecular and Cell Biology. (F,SP) Staff

Note: Biology 1A and 1B are each taught both semesters, and students may enroll in either (but not both) during either the fall or spring semester.

32. Introduction to Human Physiology. (3) Three hours of lecture per week. Prerequisites: One year high school or college chemistry; A comprehensive introduction to human physiology. The course will concentrate on basic mechanisms underlying human life processes, including cells and membranes; nerve and muscle function; cardiovascular, respiratory, renal, and gastrointestinal physiology; metabolism, endocrinology, and reproduction. (F,SP) Staff

32L. Introduction to Human Physiology Laboratory. (2) Three hours of laboratory and one hour of lecture per week. Prerequisites: 32 or may be taken concurrently. Experiments and demonstrations are designed to amplify and reinforce information presented in 32. Exercises include investigations into the structure and function of muscle, nerve, cardiovascular, renal, respiratory, endocrine, and blood systems. (F,SP) Staff

Upper Division Courses

130. Cell Biology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A; 1B; or consent of instructor. Formerly 130K. An introductory survey of cell biology. The course will concentrate on basic mechanisms underlying human life processes, including cells and membranes; nerve and muscle function; cardiovascular, respiratory, renal, and gastrointestinal physiology; metabolism, endocrinology, and reproduction. (F,SP) Staff

135. Topics in Cell and Developmental Biology. (135) No credit for 135 after Integrative Biology 132. Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Formerly 135K. An introduction to selected topics, with emphasis on illustrated review of key literature and of reviews; two presentations by the faculty; problem sets; discussion of each presentation. (F,SP) Staff

135V. Cell Biology of the Eye and Mechanisms of Ocular Disease. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly 135V. Structure of ocular tissues; mela- nnea; immune response; ciliary body and external eye; corneal and lens anatomy; eye pathology; gastrointestinal physiology; discussion section led by Graduate Student Instructo (SP). Staff

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. Prerequ- isites: Biology 1A-1B, Physics 8A-8B. Principles of mammalian (primarily human) physiology emphasizing physical, chemical, molecular and cellular bases of functional biology. The following topics will be covered: cardiovascular physiology; respiration; renal physiology; gastrointestinal physiology; and nervous system regulation; skeletal, smooth, and cardiac muscle; cardiovascular physiology; respiration; renal phys- iology; gastrointestinal physiology. Discussion section is led by Graduate Student Instructor. Students will receive material covered in lecture. (SP) Staff

137. Computer Simulation in Biology. (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: Formerly 137. Computer simulation of dynamic biological processes using special graphical interfaces requiring very little mathematical or computer experience. First half is realistic models with pre- sentation of original research. (F,SP) Staff

138. Wednesday Evening Development Seminar. (2) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly 238. Development Seminar. Presentations by the faculty; problem sets; discussion of each presentation. (F,SP) Staff

139. Research Seminar in Cell and Developmental Biology. Options are described. (139A,139B,139C,139D,139E,139F,139G,139H,139I,139J,139K,139L,139M,139N,139O,139P,139Q,139R,139S) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly 239. This class consists of relatively informal weekly research presentations in the areas of developmental biology, developmental neurobiology, or related areas of cell biology. Speakers are usually recruited from campus graduate students, postdocs, and faculty with occasional outside visitors. The instructors strive to foster extensive questions and discussions in the course of each presentation. (F,SP) Staff

140. Advanced Mammalian Physiology. (5) Three hours of lecture and two hours of discussion per week. Prerequisites: Consent of instructor. Principles of mammalian (primarily human) physiology emphasizing physical, chemical, molecular, and cellular bases of functional biology. The following topics will be covered: cardiovascular and membrane physiology; cell cycle and cell motility; gene expression, and cell interactions. Early development of selected vertebrates and invertebrates will be described. Basic experimental methods and new approaches will be presented. A weekly discussion section with readings from the research literature is required. Students will prepare a mini grant proposal. (SP) Staff

C232. Advanced Topics in Endocrinology. (2) One hour of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. During the first half of the semester selected faculty and guest lecturers will present lectures on topics of their interest and will discuss the material afterwards. During the second half of the semester students will present lectures on related topics or other approved subjects. Also listed as Integrative Biology C203.

141. Genetics and Society. (3) Students will receive 2 units for Molecular and Cell Biology 41 after taking 41X, Interdepartmental Studies 41X, or Plant Biology 41 after two hours of lecture and one hour of discussion.

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honor's course
R prefix=course satisfies R&C requirement
AC suffix=course satisfies American cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

Molecular and Cell Biology / 339

Division of Genetics and Development

Head: Richard Harland

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 41 after two hours of lecture and one hour of discussion.
per week. Prerequisites: Primarily for students not specializing in biology. Basic mechanisms of inheritance; gene mapping; gene expression and genetic disease in animals and humans; social implications of genetics. (SP) Staff

C41X. Heredity and Society. (4) Students will receive 2 units for Molecular and Cell Biology 41X after taking 41. Two hours of lecture and two hours of discussion per week. Prerequisites: Primarily for students not majoring in the biological sciences. Basic genetic principles and mechanisms, evolution, philosophical implications and societal aspects of genetics. (F) Staff

Upper Division Courses

140. General Genetics. (4) Students will receive 1 unit of credit after taking 142. Three hours of lecture and one hour of discussion per week. Prerequisites: 100 is required and either 110 (which may be taken concurrently) or consent of instructor. In-depth introduction to genetics: inheritance; gene transmission and recombination; transposable DNA elements; gene structure, function, and regulation; and developmental genetics. Some exams may be given in the evening. (F,SP) Staff

140L. Genetics Laboratory. (4) Six hours of laboratory and two hours of lecture per week. Prerequisites: 140. May be taken concurrently. Experimental techniques in classical and molecular genetics. (SP) Staff

142. Survey of General Genetics. (4) Not open to students with credit in 140. Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B or consent of instructor. This course will provide an in-depth introduction to genetics; gene transmission and recombination; transposable DNA elements; gene structure, function, and regulation; and developmental genetics. Some exams may be given in the evening. (F,SP) Staff

Graduate Courses

240. Advanced Genetic Analysis. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Principles and practice of classical and modern genetic analysis as applied to eukaryotic organisms, including yeast, nematodes, Drosophila, mice and humans; isolation and analysis of mutations; gene mapping; suppressor analysis; chromosome structure; control of gene expression; and developmental genetics. (F) Cline, Drubin, Meyer

241. General Genetics Workshop. (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 in-depth introduction to genetics, including mechanisms of inheritance; gene transmission and recombination; transposable DNA elements; gene structure, function, and regulation; and developmental genetics. Some exams may be given in the evening. Courses 140 and 241 are taught concurrently. Students enrolled in 241 will also be required to participate in a specialized discussion section per week, led by the course instructor. This section will cover methodological background and will be based on the primary literature of the field. (F,SP) Staff

242A-242B. Advanced Topics in Genetics. (2,2) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: Graduate standing with 110 and 140 or equivalents; or consent of instructor. Advanced level of coverage of current research problems in genetics. The topic will vary from year to year.

244. Developmental Genetics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Graduate standing or consent of instructor. Genetic and molecular genetic approaches to understanding the development of multicellular organisms. (F) Staff

C246. Topics in Genomics and Computational Biology. (2) Four hours of lecture, paper review, and discussion per week. Prerequisites: Consent of instructor. Instruction and discussion of current topics in genomics and computational biology. The course will provide background information about computational biology and genomics methodologies. This will be followed by critical discussion of recent results in these fields. Also listed as Plant Biology C246. (SP) Brenner, Eisen

247L. Molecular Genetics Laboratory. (3) Two hours of lecture and six hours of laboratory for ten weeks. Prerequisites: Consent of instructor. This course for graduate students will teach the principles and practices of the basic techniques of molecular genetics. Its goal is to introduce modern methods for manipulation and analysis of DNA. (F) Rubin

248L. Bioinformatics for Molecular Genetics. (1) Three hours of lecture and five hours of laboratory for the last five weeks of the semester. Prerequisites: Graduate standing. Not a prerequisite to 248L. This course will provide a practical guide to the basic tools available for the analysis of DNA and protein sequences. The underlying algorithms behind the methods, the choice of the appropriate method, and the evaluation of results will be discussed. (F) Rubin

249. Research Review in Genetics and Development. 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)

249B. Metazoan Sex Determination. (2) Molecular and genetic aspects of Metazoan sex determination, with emphasis on Drosophila melanogaster. Cline

249C. Nucleic Acid-Protein Interactions and Control of Gene Expression. (2) Biochemical and molecular genetic aspects 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 products 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) Molecular and genetic approaches to the problem of how neurons develop, with emphasis on Drosophila melanogaster and Caenorhabditis elegans. (F,SP) Garriga

249G. Gene Expression in Drosophila. (2) Prerequisites: Consent of instructor. Formerly 234. Presentations and discussion of current research on gene regulation in Drosophila and other eukaryotes. (F,SP) Beckendorf

249J. Developmental and Molecular Genetics of C. elegans. (2) Prerequisites: Consent of instructor. Molecular and genetic analysis of sex determination 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 experiments in the field. (F,SP) Barnes

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

249P. Mesodermal Patternin and Segmentation. (2) Genetic, molecular, and embryological aspects of mesodermal patterning and segmentation, with emphasis on the vertebrate, zebrabith. (F,SP) Amacher

249Q. Computational Genomics. (2) Recent developments in computational methods for genomics and their application for understanding the structure and function of genes encoded in completely sequenced genomes. (F,SP) Brenner

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 discussion of current experiments in the field. (F,SP) Skarnes

249Y. Mechanics 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. Am- phibian egg formation, mesoderm induction, neural in- duction, and patterning of the nervous system at the molecular level. Control of transcription, post-trans- criptional control of gene expression (including control of RNA turnover and RNA localization). (F,SP) Har- land

249Z. The Cytoskeleton and Morphogenesis. (2) Prerequisites: Consent of instructor. Review of current lit- erature and discussion of current research. (F,SP) Dru- bin

Division of Immunology

Head: David H. Raulet

Lower Division Courses

50. The Immune System and Disease. (3) Students will receive no credit for 50 after taking 150. Three hours of lecture per week. Prerequisites: High school biology and chemistry. Course will focus on the im- mune system resolves, prevents, or causes disease. Lectures will focus on current immunology research topics including vaccines, drug resistance, autoimmu- nity, allergy, cancer, AIDS, and biotechnology. Em- phasis will be given to understanding the role of im- munity in human health and disease. (SP) Beatty

Upper Division Courses

150L. Immunology Laboratory. (4) Eight hours of laboratory and one hour of discussion per week. Prerequisites: Consent of instructor. May be taken concurrently. Prerequisites: Consent of instructor. Formerly Microbiology 103L. Experimental techniques in mammalian molecular biology and cellular immunology. Molecular techniques covered include recombinant DNA procedures such as gene cloning, gene transfer, DNA sequencing, Southern blot, and restriction mapping. Immunological techniques covered include cell culture and monoclonal antibody production, detection of fluorescent antibodies, ELISA, radiolmmunoassay, and western blot. (F,SP) Shastry, Beatty

150L. Immunology Laboratory. (4) Eight hours of laboratory and one hour of discussion per week. Prerequisites: Consent of instructor. May be taken concurrently. Prerequisites: Consent of instructor. Formerly Microbiology 103L. Experimental techniques in mammalian molecular biology and cellular immunology. Molecular techniques covered include recombinant DNA procedures such as gene cloning, gene transfer, DNA sequencing, Southern blot, and restriction mapping. Immunological techniques covered include cell culture and monoclonal antibody production, detection of fluorescent antibodies, ELISA, radiolmmunoassay, and western blot. (F,SP) Shastry, Beatty

152. The Immune System. (4) Not open to students with credit in 150. Not intended for majors. Prerequi- sites: Consent of instructor. Chemistry 1A; Chemistry 2A; recommended. Survey of immunology with emphasis on relevance of the immune system to human health and disease. Topics covered include description of the immune system, antibody and T-cell receptor structure and function, genes of the immune system, superfamily, cells and molecular mediators that regulate the immune response, allergy, au- toimmunity, immunodeficiency, tissue and organ transplants, and tumor immunology. (F,SP) Shastri, Beatty

150L. Immunology Laboratory. (4) Eight hours of laboratory and one hour of lecture per week. Prerequisites: Consent of instructor. May be taken concurrently. Prerequisites: Consent of instructor. Formerly Microbiology 103L. Experimental techniques in mammalian molecular biology and cellular immunology. Molecular techniques covered include recombinant DNA procedures such as gene cloning, gene transfer, DNA sequencing, Southern blot, and restriction mapping. Immunological techniques covered include cell culture and monoclonal antibody production, detection of fluorescent antibodies, ELISA, radiolmmunoassay, and western blot. (F,SP) Shastry, Beatty

Graduate Courses

250. Advanced Immunology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100, 110, 140, 150 or consent of instructor. Molecular and cellular analysis of the immune re-
sponse. Structure and function of antibodies and an-
tibody genes including antibody-antigen reactions, principles of molecular recognition, recombination and regulation of antibody genes, and the immunoglobulin classes, sub-classes, and isotypes. The effects of differ-
tentiation, activation, and senescence. Structure and function of T cell receptors and T cell receptor genes; antigen processing and pre-
tabulation, and role of MHC molecules in guiding T cell recognition; T cell activation, differentiation, proliferation, and tolerance. Analysis of T cells, natural killer cells, and tumor surveillance. (SP) Raulet, Robey, Sha

251. The Regulation of Immune System Develop-
ment 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 molecular and cellular immunology. Each registrant will present a 30-minute research talk describing the prob-
lems they are studying, the approach they are taking, their preliminary data, and technical problems. Other course participants (including basic immunology fac-
ulty) will provide criticism and suggestions. (SP) Schlis-
sel

254. Immunobiology of Tumors. (2) Course may be repeated for credit with consent of instructor. Two hours 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 molecular and cellular immunology. Each registrant will present a 30-minute research talk describing the prob-
lems they are studying, the approach they are taking, their preliminary data, and technical problems. Other course participants (including basic immunology fac-
ulty) will provide criticism and suggestions. (SP) Schlis-
sel

Upper Division Courses

160. Introduction to Neurobiology. (4) Three hours of lecture and one hour of discussion per week. Pre-
requisites: 160 or equivalent. Formerly IDS 102B. Ad-
vanced coverage of current research problems in sys-
tems level neuroscience, and advanced and experimental computational tools used for these studies. Of-
fered odd-numbered years. (F) Staff

259. Research Review in Neurobiology. 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)

259A. Differentiation of T lymphocytes. (2) Molecular and biological analysis of T cell differentiation, with par-
ticular emphasis on the T cell antigen receptor and re-
lated structures. Allison

259B. Specificity of T lymphocytes. (2) Molecular ba-
sis of antigen recognition function of T lymphocytes. Shastri

259C. Regulation of T Cell Receptor Genes Expres-
sion. (2) Molecular biology of T cell receptor genes and their control and potential for prevention or pre-
treatment of cancer. The course will examine the application of basic re-
search in immune regulation to more applied studies in animal models and clinical trials. Introductory lecture-
tures will be followed by student presentations of or-
iginal literature and lectures by invited speakers en-
gaged in translational and clinical research in tumor im-
munotherapy. Offered even-numbered years. (SP) Al-
ilson

259R. Potassium Channels and Synaptic Plasticity. (2) (F,SP)

261. Advanced Cellular Neurobiology. (3) Three hours of lecture per week. Prerequisites: 160 or equivalent. Advanced level coverage of current re-
search problems in the embryonic and post-embryonic development of invertebrate and vertebrate nervous systems. Offered odd-numbered years. (SP) Goodman

261A. Development of the Leech Nervous System. (2) (F,SP) Sclater

261B. Synaptic Transmission and Neuromodulation. (2) (F,SP) Zucker

261E. Auditory Neuroscience. (2) (F,SP) Winer

261F. Retinal Signal Processing. (2) (F,SP) Owen

261G. Neural Systems. (2) (F,SP) Westheimer

261H. Recent Advances in Retinal Neurobiology. (2) (F,SP) Werblin

261K. Ion Channels and Membrane Excitability. (2) (F,SP) Lecar

261L. Neurobiology Laboratory. (4) Three hours of laboratory and one hour of lecture per week. Pre-
requisites: 160 or equivalent. Experimental analyses of properties and interactions of nerve cells and systems, illustrating prin-
cipal features and current methods. Techniques em-
ployed include computer simulation of neuron prop-
eries, electrophysiological recording and stimulation of nerves and cells, digitally enhanced video imaging of output, fluorescence immunocytochemistry, analy-
ysis of sensory: CNS mapping, human-evoked po-
tential recordings, sensory psychophysics. (SP) Bent-
ley, Zucker

162. Developmental Neurobiology. (3) Two hours of lecture and one hour of discussion per week. Pre-
requisites: 130, 160 or equivalent. Analysis of the strate-
gies and processes of nervous system development, including generation of diverse nerve cell types, guid-
ance of growing nerve fibers, competition and cell death in the maturation of synaptic connections, plas-
ticity, and genetic and molecular mechanisms. Offered even-numbered years. (SP) Goodman

163. Mammalian Neuroanatomy. (4) Three hours of lecture and two hours of laboratory per week. Pr-
requisites: Biology 1A. Development, structure (gross and micro-sopic), and functional relationships of the mammalian nervous system. (F) Winer

164. Sensory and Integrative Neurobiology. (3) Three hours of lecture per week. Prerequisites: 160. Transduction, coding and information processing in a variety of sensory systems, including vision, audition, olfaction and others. Neural circuitry, modulation of synaptic transmission, integrative mechanisms at dif-
ferent levels of sensory processing. Correlation of find-
ings and principles from neurophysiology and psy-
chophysiology. Offered even-numbered years. (SP) Staff

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 chan-
nels, neurotransmitters and their receptors, second-
messenger systems, and molecular mechanisms of development and plasticity. (SP) Presti

166. Biophysical Neurobiology. (3) Three hours of lecture per week. Prerequisites: Biology 1A, Physics 8A-8B, Chemistry 1A, 3A-3B, and consent of instruc-
tor. Formerly 115. Biophysical properties of ion chan-
nels and selectivity, membrane transport phenomena. Sensory transduction, optical measurements and microscopy. Cellular networks as computational devices, information processing and trans-
fer. (F) Lecar
90. Freshman Seminars. Course may be repeated for credit as topic varies. One hour of seminar per week. Prerequisites: Open to freshmen only. The Berkeley Seminar Program has been designed to provide new students with 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) Staff

90A. Biochemistry and Molecular Biology. (1)

90B. Cell and Developmental Biology. (1)

90C. Genetics and Development. (1)

90E. Neurobiology. (1)

91. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Two to four hours of seminar per week. Prerequisites: Open to freshmen and sophomores only. 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

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, preferably introduced to the "culture" of the biological sciences, along with an in-depth orientation to the academic life and the culture of the university as they relate to majors in biology. Students will learn about expectations for intellectual work that they can use in their major course, and as future science professionals. Restricted to freshmen in the biology scholars program. Also listed as Plant Biology C96 and Integrative Biology C96. (F,SP, Fall only)

98. Directed Group Study. (1-4) Course may be repeated for credit. One hour or more of work per week. Prerequisites: Open to 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 lab per week to a maximum of four units. Supervised research. Must be taken on a passed/not passed basis. Prerequisites: 3.3 GPA and consent of instructor. (F,SP)

Upper Division Courses

180. Undergraduate Teaching of Biology 1A. (1,2) Course may be repeated for a maximum of 4 units. Conference with instructor and teaching hours as assigned per week. Prerequisites: Biology 1A, with a minimum grade of B. Appointment as a UGSI in biology 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.). (F,SP) Staff

190. Proseminar. (1) Course may be repeated for credit. Two hours of seminar for ten weeks. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. One section to be offered each semester. Must be taken by students interested in participating in an independent study experience. Prerequisites: Consent of instructor. Staff

H196. Honors Research. (1-4) Course may be repeated for a maximum of 8 units. Laboratory research, conferences. Prerequisites: 199 or equivalent; consent of instructor; honors program. Individual research under the supervision of a faculty member. A thesis and presentation for at least 4 units are required for honors in the major. GPA restrictions apply. (F,SP) Staff

196. Directed Group Study. (1-4) Course may be repeated for credit. One hour or more of work per week. Prerequisites: Upper division standing. Lectures and small group discussions focusing on topics of interest, varying from semester to semester.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Laboratory research, conferences. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalog. (F,SP) Staff

Graduate Courses

290. Graduate Seminar. (1) Course may be repeated for credit. One hour of seminar per week. Prerequisites: Graduate standing in the department or consent of instructor. Graduate student presentations on selected research topics in molecular and cellular biology. Offered every second semester. Must be repeated for a maximum of 8 units. 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

291A. Introduction to Research. (4-12) 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. (4-12) 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. (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. (1) One hour of seminar per week. Credit and grade to be awarded on completion of sequence. Prerequisites: Concurrent enrollment in 291A or 292. Seminar on presentation and evaluation of results in area of student's individual research interests. (F) Staff

293B. Research Seminar. (1) One hour of seminar per week. Credit and grade to be awarded on completion of sequence. Prerequisites: 293A; concurrent enrollment in 291B or 292. Seminar on presentation and evaluation of results in area of student's individual research interests. (SP) Staff

293C. Responsible Conduct of Research. (1) Course may be repeated for credit. One and one-half 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 in the light of case studies from the Association of American Medical Colleges and the NIH. Students will review case studies of misconduct in preclinical and clinical research. Prerequisites: Consent of instructor. Must be repeated for a maximum of 8 units. Laboratory research, conferences. Must be taken on a satisfactory/unsatisfactory basis. (SP) Staff

295. Careers for Life Sciences Ph.D.'s. (1) One hour of lecture and one-half hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Open to graduate and postdoctoral students. This course is designed to assist graduate students in the biological sciences with planning their postgraduate careers. Weekly guest speakers will present their experiences on a variety of topics. Postdoctoral students are invited. Topics may include: academic and alternative tracks; setting up a laboratory, intellectual property law/technology transfer; public policy/regulatory affairs; bioinformatics; science writing/technical support; forensic science; postdoctoral positions in industry; teaching, and other interests of topic. (SP) Staff

297. Methods and Logic in Biology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: MCB graduate students. The focus of this course will be on some of the papers in the scientific literature that provide the discoveries and methods critical to modern molecular and cell biology. Students will learn how to dissect published literature to evaluate precisely what constitutes an important paper. The themes for the methods and logic course will be broadly applicable to all students interested in modern experimental biology. Students will meet and discuss the themes of a series of papers first by themselves and then as a group, and students interested in modern experimental biology. Students will meet and discuss the themes of a series of papers first by themselves and then as a group. 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. Must be taken on a satisfactory/unsatisfactory basis. Individual study for the comprehensive or language examinations in consultation with the field advisor. (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. Reading and conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Restricted to Ph.D. candidates. 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

Professional Courses

380. Teaching of Molecular and Cell Biology. (1-2) Course may be repeated for a maximum of 4 units. Weekly conference with instructor and teaching hours as assigned. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as graduate student instructor or consent of instructor. Teaching laboratories and/or discussions for Molecular and Cell Biology courses: analysis of specific format and problems. Two units of credit: one unit for those with 25% teaching appointment; one unit of credit for those with 50% teaching appointment. (F,SP) Staff

481. Instrumentation in Molecular and Cell Biology. (1) Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing; consent of instructor and sponsorship of a faculty member. Individualized laboratory instruction. (F,SP) Staff

481B. Transmission Electron Microscopy. (1) Prerequisites: Graduate standing; consent of instructor and sponsorship of a faculty member. Scanning Electron Microscopy. (SP) Staff

481C. Scanning Electron Microscopy. (1-4) Prerequisites: Graduate standing; consent of instructor and sponsorship of a faculty member. (F,SP) Staff

Interdepartmental Studies Courses

Upper Division Courses

IDS 114A-114B. Advances in Aging. (2,2) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: IDS 114A. High school chemistry. This interdisciplinary course will single out specific topics in aging of great current interest and present lectures on several aspects of each topic (biomedical, health, socio-economic, legal, and ethical). Each semester a different topic will be presented. Invited speakers with special expertise in these areas will participate. Sponsoring departments: Molecular and Cell Biology, Optometry, Public Health, and Social Welfare. (F,SP) Timiras

Graduate Courses

IDS 282. Tumor Biology 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. Reviews and reports of current research in tumor biology. Sponsoring departments: Integrative Biology and Molecular and Cell Biology.
Music

(College of Letters and Science)

Department Office: 104 Morrison Hall, (510) 642-2678
http://LS.Berkeley.edu/dept/music

Chair: Wye J. Allanbrook, Ph.D.

Professors

Wye J. Allanbrook, Ph.D. Stanford University. Late 18th-19th-century music
Mary Kay Duggan, Ph.D. University of California. History of book, music and technology
Edward Dugger, M.F.A. Princeton University. Composition, electronic music
Joëlle Besly, Ph.D. University of Michigan. Caribbean music, popular music, cultural studies
Thomas Newcomb, Ph.D. Newcomb University. Italian magical, 19th-century music
John Roberts, Ph.D. University of California, Berkeley. Early Italian opera
Richard Tanusik (Class of 1955 Chair), Ph.D. Columbia University. Renaissance, period, Russian music. Stravinsky
John Thow, Ph.D. Harvard University. Composition, American 20th-century music
Barbara Krogman and Evelyn Hennings Chambers Chair in Music, Ph.D. University of California. Ethnomusicology, South and East Asia
David Wessel, Ph.D. Stanford University. Computer music, music perception
Ol'Yanis, Ph.D. University of Iowa. Composition, 20th-century, African-American music
Richard L. Crocker, Ph.D. (Emeritus) Alan Curtis, Ph.D. (Emeritus) Richard Felciano, Ph.D. (Emeritus)
Lawrence H. Moe, Ph.D. (Emeritus) Joaquín Nin-Culmell, M.M. (Emeritus)
Michael Senturia, A.B. (Emeritus)

Acting Professor

David Moroney, Ph.D. University of California, Berkeley. Baroque performance practice, harpsichord, organ

Associate Professors

Katherine Bergeron, Ph.D. Cornell University. Cultural criticism, comparative musicology
Benjamin Brinner, Ph.D. University of California, Berkeley. Ethnomusicology, Indonesian music, Middle Eastern music
Cindy Cox, M.A. Indiana University. Composition, Multicultural, University, Clarinet, education
Jorge Lifderman, Ph.D. University of Chicago. Composition, and cello, musicology
David Milnes, D.M.A. Yale University, Director, University Symphony, orchestral conducting technique

Action Professor

Steve Coleman, Improvisation theory, jazz

Assistant Professors

Edmund Campion, D.M.A. Columbia University. Composition
Mary Ann Smart, Ph.D. Cornell University. Gender issues, 20th-century music
Kate Hanley, Ph.D. University of Chicago. French Renaissance, modernism

Senior Lecturers

Elizabeth Davison, M.A. (Emerita) John M. Swackhammer, A.B. (Emeritus)

Lecturers


Lecturers

Gianna Abondolo, M.M. (Violinconcio, chamber music) Virginia Baker (Viola) Bill Bell, M.A. (Jazz piano)
Deborah Berger, M.M. (Voice) Elizabeth Blumenstock (Baroque violin quartet, viola da gamba)
Catherine Bond, M.M. (Piano, fortepano) Robert Calorio, M.A. (Wind ensemble)
Richard Chesher, B.M. & B. Trombone (B. Trombone) Jacqueline Cheek, M.M. (Piano)
Scott Cmeli, B.M. (Guitar) Norah Connor, M.M. (Cello)
Jeff Davis, M.M. (Carnival) John Dehaan, M.M. (Vienna)
Anna Carol Dudley, M.A. (Voice) Lawrence Fenn, M.M. (Guitar)
Leighton Fong, M.M. (Violoncello) Rodney Gehke, M.A. (Organ)
Barbara Graziano, M.M. (Organ) Dema Giannopulos (Ph.D. Musicology) Laurette Goldberg, B.Mus. (Harpsichord)
Danny Gordon, M.M. (Vibraphone) Peter Hallfax, M.M. (Viola da gamba)
Katherine Haven, M.M. (Harpsichord, fortepano) Sylvester Henderson, M.A. (Gospel choirs)
Eugeny Ionov (Oboe) Jeffrey Thomas, B.A. (Vocals)
Jonathan Khun, Ph.D. (Opera workshop) C.J. Kladzko (African drum)

Music / 334

Julie Mackenzie, B.M. (Flute) Janet Maestre, B.Mus. (Flute)
Anthony Martinez, B.A. (College Musicium)
Robin May, LL.B. (Oboe)
Laure McGaw, M.A. (Trumpet)
Emil Miland (Cello)
Michael Orland, A.B. (Musicianship, Piano)
Stephen Paulson, B. Mus. (Bassoon)
David Pereira, Ph.D. (Harmony)
Allen Poulack, Ph.D. (Glotem chamber music)
Elizabeth Reese, M.M. (Viola da gamba)
Vana Restelli, I.R.A.M. (Voice)
Serban Rusu, M.A. (Musicianship, Piano)
Allen Shearer, Ph.D. (Voice)
Barbara Shearer, D.M.A. (Musicianship, Piano)
Benjamin Simon, M.M. (Chamber music, viola)
David Taylor, Ph.D. (Lute)
Jeffrey Thomas, B.A. (Voice)
Peter Wathnaford, B.M. (Tuba)
Robert Ward, B.M. ( Horn)
Martha Wasley, A.B. (Piano)
William Winant, M.F.A. (Composer)
Richard Worn, M.M. (String bass)

Minor and Transfer Adviser: Mr. Alexander (student affairs officer).

Major Advisers: Department faculty by assignment.

Graduate Advisers: Composition, Mr. Liderman; History and Literature, Mr. Tanusik; Ethnomusicology, Ms. Guilbault.

Department Overview

Note: Because the Department of Music is in the process of substantial curricular changes in the major, minor, and the graduand of Music in ethnomusicology, students should consult the department Web site for current requirements and course numbers.

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 Memorial Hall, Morrison Music Building, and elsewhere. For undergraduates the department offers a major in music, as well as numerous nonmajor courses for the student with little or no previous experience in music. A minor in music draws courses on either majors or nonmajors, depending on student qualifications. For graduate students the department offers programs leading to the M.A. and Ph.D. degrees in musical composition and in research.

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 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 to auditors.

All students who wish either to audit or to enroll in performance courses should consult the Schedule of Classes for information on audition appointments.

Students who plan to major in music or take any of the principles and methods for one or two semesters of either Music 141, University Symphony, or Music 142, University Chamber Music. The project is started.

Students complete a minimum of 24 semester units of upper division music major courses from the series 130A-179 or from courses that have an “M” designation. These courses must include the following requirements: A two-semester sequence of either Music 141, University Symphony, or Music 142, University Chamber Music. Students also take from courses from the performance series 140-149; History of Western Music 170; one course from the series 130A, 130B, or 131-139; one course from the series 171-117.

Honor Program. The Department of Music offers an individualized program leading to the A.B. degree with honors. Students with a grade-point average of 3.3 overall and 3.5 in the major may apply for enrollment in the honors major. The two major courses numbered between 151 and 179 may be substituted for a course in the 120s and 130s. A designation of “M” may be taken from courses numbered in the 140s. A course numbered between 151 and 179 may be authorized for one or two semesters of study. The student affairs officer in the department office.

Teaching Training. Consult major advisers.

The Minor

Lower Division

Two courses in musicianship and two courses in harmony, historically oriented. Alternatively, 60A-06B, or the nonmajor series 20A-20B and 25A-25B; either Introduction to Music (27) or History of Western Music (75 or 76) in American Culture (26AC).

Upper Division

A minimum of five courses. At least two must be taken from courses numbered in the 120s and 130s (including IDS 135) and at least two must be taken from courses numbered in the 140s. A course numbered between 151 and 179 may be substituted for a course in the 120s and 130s on completion of the prerequisites and with the instructor’s approval.

All courses taken in the minor must be taken for a letter grade. The College of Letters and Science requires an overall grade-point average of 2.0 in upper division courses.

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
per division courses applied to the minor program. 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 and the student should bring a copy of their unofficial transcript.

Music minors who wish to take the harmony and musicianship classes for the major must first take the placement examination, which is given at the beginning of each semester.

Graduate Programs

The Department of Music offers programs leading to the M.A. and Ph.D. degrees in composition and scholarship, 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 deadline for application is December 15. Applicants in compositional studies only are asked to take the department’s entrance examinations in music history, harmony, and musicianship. Arrangements for taking the exam must be made by December 15.

Lower Division Courses

20A-20B. Basic Musicianship, (2,2) Three hours of lecture per week. Fundamentals of music, including notation, sight singing, ear training, and beginning linear and vertical analysis. For general students. Emphasis on written exercises. (F,SP)

23. Music Culture and the Digital Multimedia Environment. (3) Two hours of lecture and one hour of laboratory per week. Prerequisites: Reading knowledge of music, basic familiarity with computers and the web. Study and analysis of music in a digital multimedia environment of performance, composition, and listening. Analysis of music resources on the web. Use of software for design of web sites, creation and manipulation of music sites, score notation in MIDI and other digital formats. Includes discussion of digital composition and performance, music copyright, music sound and print publishing, and music in conjunction with digital images, with occasional guest lectures. Focus on music culture varies. (F,SP) Duggan

25A-25B. Introduction to Music Theory. (4,4) Three hours of lecture 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 freshmen. For general students. Emphasis on written exercises. (F,SP)

26AC. Music in American Culture, (4) Three hours of lecture and one hour of discussion 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, Asian, European, Hispanic/Latino, and Native American. Lectures and musical examples are organized by topics such as music of socio-economic subgroups within large groups: social class, culture, pan-ethnic, religious, and concert music, and the folk-popular music continuum. This course satisfies the American cultures requirement. (F,SP) Guibault

27. Introduction to Western Music. (3) 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 types of Western art music. (F,SP) Bergeron, Smart, Van Orden

28. Listening to Many Musics. (3) Three hours of lecture and one hour of laboratory devoted to performance workshops and discussion. Opening ears and minds to musical sounds and the people who make them, imparting basic concepts and ways of listening in order to deepen students’ experience of music from a variety of cultures: West African, Middle Eastern, and Southeast Asian traditions (specific traditions may vary depending on instructor). While the emphasis is on listening, students will become physically involved through hands-on workshops.

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: 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 for campus and departmental topics vary from department to department and from semester to semester. (F,SP)

49A. Introduction to Music Criticism. (2) Two hours of lecture per week. Prerequisites: Department placement exam; 49B-49C (to be taken concurrently). Introduces prospective music critics to music, music history, and the musical world. (F,SP)

49B. Musicianship. (3) Three hours of lecture per week. Prerequisites: Music Placement Examination. Formerly 60A. 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 analytical studies. Emphasis on written exercises.

50. Musicianship. (3) Three hours of lecture per week. Prerequisites: 49C and 50A. Three hours of lecture per week. Prerequisites: Advanced placement in Music Placement Examination or 50B. Continuation of diatonic sight singing and ear training, introduction to chromatic sight singing, ear training, keyboard harmony, and score reading.

51A. Musicianship. (3) Three hours of lecture per week. Prerequisites: Advanced placement in Music Placement Examination or 550B. Three hours of lecture per week. Prerequisites: Advanced placement in Music Placement Examination or 51A. Advanced chromatic ear training, sight singing, keyboard harmony, and score reading. (SP) Dana, Rosenak

60. Harmony. (3) Three hours of lecture per week. Prerequisites: Advanced placement in Harmony Placement Exam. Formerly 60A. Diatonic harmony, modulation, introduction to altered chords, choral harmonization, and analytic studies. Emphasis on written exercises. (F,SP)

61A. Harmony. (4) Three hours of lecture per week. Prerequisites: Advanced placement in Harmony Placement Exam. Formerly 61A. Advanced diatonic harmony, modulation, introduction to altered chords, choral harmonization, and analytic studies. Emphasis on written exercises. (F,SP)

61B. Harmony. (4) Three hours of lecture per week. Prerequisites: Advanced placement in Harmony Placement Examination or 61A. Advanced chromatic harmony, early 20th-century harmony, and analytic studies. Emphasis on written exercises. (SP)

75. History of Western Music: Music to 1700. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 50A or 60A. Formerly 171A. At this time, music was in flux as composers developed new techniques, forms, and ideas. This course provides a survey of music from the Middle Ages to the Baroque period.

76. History of Western Music: The 18th and 19th Centuries. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 50A and 60A. Formerly 70. Music of the 18th and 19th centuries saw the development of new compositional techniques and the rise of nationalism. This course focuses on the music of these periods.

98. Directed Group Study for Freshmen and Sophomores. (1-4) Course may be repeated for credit. Two contact hours per unit per week. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing and consent of instructor. Group study in a field that may not coincide with that of any regular course. See the Introduction to Courses and Curricula section of the General Catalog for enrollment restrictions. (F,SP) Staff

99. Independent Study for Freshmen and Sophomores. (1-4) Course may be repeated for credit. Two contact hours per unit per week. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing and consent of instructor. Directed individual study in a field that may not coincide with that of any regular course. See the Introduction to Courses and Curricula section of the General Catalog for enrollment restrictions. (F,SP) Staff

Upper Division Courses

108. Music Perception and Cognition. (4) Three hours of lecture per week. Prerequisites: 27 or consent of instructor. Formerly 115. A review of the sensory, perceptual, and cognitive foundations of listening, perceiving, and composing. Topics include relations among various acoustic and perceptual characteristics of sound; perception of pitch, temporal relationships, timbre, stability conditions, and auditory space; auditory scene analysis and perceptual grouping phenomena; perceptual processing for melody, rhythm, and harmonic organization; and perception of pitch, timbre, and auditory space. (SP)

108M. Music Perception and Cognition. (3) Three hours of lecture per week. Prerequisites: Consent of instructor or background in harmony required. The philosophical and theoretical implications of music perception and cognition. (SP) Coleman

109. Symbolic Philosophy of Music Improvisation. (3) Three hours of lecture per week. Prerequisites: Consent of instructor; background in music required. The philosophical and theoretical implications of music improvisation. Focus will be on the recent developments of the major African-American contemporary composers. (F,SP) Coleman

109M. Symbolic Philosophy of Music Improvisation. (3) Three hours of lecture per week. Prerequisites: Music majors only; 61B (may be taken concurrently). Formerly 115. An introduction to the philosophy and cognitive foundations of Western music improvisation. Focus will be on the recent developments of the major African-American contemporary composers. (F,SP) Coleman

116. Jazz Theory and Musicianship. (4) Three hours of lecture per week. Prerequisites: Audition. A course in the study of jazz theory and improvisation. This course will cover the fundamentals of improvisation and composition in jazz. (SP) Coleman

117. Introduction to Composition. (4) Three hours of lecture per week. Prerequisites: 20B and 25B. Formerly 151. An introductory composition course using compositional models from the 18th, 19th, and early 20th centuries, studying motive structure, its extension and elaboration, and forms such as scherzo, sonata, variation, and song. (SP) Staff
117A. Introduction to Composition. (4) Three hours of lecture per week. Prerequisites: Restricted to music majors; 50B and 60B. An introductory composition course using compositional models from the 18th, 19th, and 20th centuries, studying motivic structure, its extension and elaboration, and forms such as scherzo, sonata, variation, and song. (SP) Staff

128A. Opera. (4) 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 recordings 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. A study of musical and dramatic aspects of opera. Lectures on selected operas will be supplemented by assigned recordings and films or videotapes of notable performances. Analytical studies and a term paper required.

128B. Beethoven. (4) Three hours of lecture and one hour of listening per week. Prerequisites: 27 or consent of instructor. Emphasis on the symphonies.

128C. Contemporary Music. (4) Three hours of lecture and one hour of listening per week. Prerequisites: 27 or consent of instructor. Twentieth-century music, from Stravinsky to the present.

128D. J.S. Bach. (4) Three hours of lecture and one hour of listening per week. Prerequisites: 27 or consent of instructor.

128E. Mozart and Haydn. (4) Three hours of lecture and one hour of listening per week. Prerequisites: 27 or consent of instructor.

128G. 19th- and 20th-Century Symphonic Literature. (4) Three hours of lecture and one hour of listening per week. Prerequisites: 27 or consent of instructor. Lecture. Survey of principal literary of the period, from Beethoven to Stravinsky.

128P. The Music of Women Composers. (4) Three hours of lecture and one hour of listening per week. Prerequisites: 27 or consent of instructor. Survey of representative works by women from antiquity to the present, with emphasis on the 20th century: among others, Hildegard von Bingen, Maddalena Casulana, Clara Schumann, Amy Beach, Alma Mahler, Ruth Seeger, Vivian Fine, Ellen Zwilich, Joan Tower, and Libby Larsen.

128Q. The European/American Art Song. (4) Three hours of lecture per week. Prerequisites: 27 or consent of instructor. A study of song and the interaction of poetic and musical aspects. Emphasis on the art songs of Schubert, Schumann, Brahms, Dohnanyi, and 20th-century composers. (SP) Brinner

130A. African American Music. (4) Three hours of lecture and one hour of discussion per week. Study of the African American music tradition from its West African origins to the various forms at the end of the 19th century. (F) Newcomb

130AM. African American Music. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Restricted to music majors; 51B and 61B. Study of the African American music tradition from its West African origins to the various forms at the end of the 19th century. Analytic studies and a term paper required. (F) Newcomb

130B. African American Music. (4) Three hours of lecture and one hour of discussion per week. Histori-
158. Musical Applications of Computers and Related Technologies. (4) Three hours of lecture and six hours of laboratory per week. Prerequisites: 51B and 61B. 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.

160. Introduction to Conducting. (4) Four hours of class per week. Prerequisites: 51B, 61B, and 405D, or consent of instructor. A study of the basic elements of conducting: physical gesture, score reading, and score analysis.

161. Instrumental 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 orchestral literature in various musical styles. Preparation of selected works for rehearsal and performance in class.

162. Choral Conducting. (4) Four hours of class per week. Prerequisites: 160 or consent of instructor; 152 and 156 recommended. Development of the 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.

164A-164B. Jazz Improvisation. (4) Four hours of lecture per week. Prerequisites: 51B (may be taken concurrently), 61B, or consent of instructor; 116 recommended. A study of the fundamental concepts of jazz improvisation, designed for performers with the aim of developing skill in improvisation. Blues improvisation, jazz notation, principles of harmonic structure, substitutions and extensions, and thematic development associated with major styles of modern jazz will be explored. Analysis and transcription will be an integral part of the program. The course is designed to begin at the elementary level and progress through more complex material. The second semester is designed for the intermediate to advanced level performer. (F,SP)

170. History of Western Music: The 20th Century. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 61B (may be taken concurrently), 75, and 76. Formerly 71. Music of the 20th century. (SP)

171B. Studies in Medieval and Renaissance Music. (4) Three hours of lecture per week. Prerequisites: 60A and 75 (may be taken concurrently); experience playing an instrument or singing. A study of the music of the Middle Ages and the Renaissance. Focus of course will vary.

171D. The Performance of Baroque Music. (4) Three hours of lecture per week. Prerequisites: 60B 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.

171E. J. S. Bach. (4) Three hours of lecture per week. Prerequisites: 61A, 75, and 76, or consent of instructor.

172A. Mozart. (4) Three hours of lecture per week. Prerequisites: 61A, 75 and 76, or consent of instructor.

172B. Beethoven. (4) Three hours of lecture per week. Prerequisites: 61A, 75, and 76, or consent of instructor.

173B. Art Song of the 19th Century. (4) Three hours of lecture per week. Prerequisites: 61A, 75, and 76, or consent of instructor. A study of art song with emphasis upon the music of Schubert and Schumann.

173C. Wagner’s Ring of the Nibelung. (4) Three hours of lecture per week. Prerequisites: 61A, 75, and 76, or consent of instructor. A study of the four operas of Wagner’s Ring cycle.

173D. Schubert to Brahms. (4) Three hours of lecture per week. Prerequisites: 61A, 75, and 76, or consent of instructor. A study of the contrasting styles represented by Schubert and Brahms.

173E. Verdi and Wagner. (4) Three hours of lecture per week. Prerequisites: 61A, 75, and 76, or consent of instructor. A study of the contrasting styles represented by Verdi and Wagner, approached through selected operas, literary works, and the composers’ writings.

174A. Debussy and Mahler. (4) Three hours of lecture per week. Prerequisites: 61B, 170, or consent of instructor. A comparison of selected works of Debussy and Mahler.

174B. Stravinsky. (4) Three hours of lecture per week. Prerequisites: 61B, 170, or consent of instructor. A comparison of the four operas of Stravinsky.

174C. Stravinsky. (4) Three hours of lecture per week. Prerequisites: 61B, 170, or consent of instructor. A comparison of selected works of Debussy and Mahler.

174D. Stravinsky. (4) Three hours of lecture per week. Prerequisites: 61B, 170, or consent of instructor. A comparison of selected works of Debussy and Mahler.

175. Seminar: Popular Music and Popular Culture. (4) Three hours of lecture per week. Prerequisites: 61B, 170, or consent of instructor. A specialized study of Jazz. The topic will change each time the course is offered.

176. Seminar: Studies in Baroque Music. (4) Three hours of lecture per week. A specialized study of Baroque music. The topic will change each time the course is offered.

216. Seminar: Studies in Contemporary 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.
analysis of popular music as culture and subculture. Focus on America, though consideration may also be given to music in the Third World. Readings in cultural studies and music criticism. Ethnographic projects.

240. Historical Readings in Ethnomusicology. (4) Three hours of seminar per week. Formerly 230. Readings on significant works in the history of the field. Selections drawn from the multiple disciplines involved in the study of music.

241. Current Readings in Ethnomusicology. (4) Three hours of seminar per week. Formerly 231. Readings of the most significant current work in the field. Selections drawn from the multiple disciplines involved in the study of music.

242. Ethnomusicology Analysis Seminar. (1) Course may be repeated for credit. One hour of seminar per week. Prerequisites: Consent of instructor. Critical analysis of published analyses and approaches to analysis in various musical traditions. Students present analyses based on their individual areas of specialization.

243. Ethnomusicalogical Method: Transcription. (3) Three hours of seminar per week. Formerly 234. Transcription systems developed for different musical traditions. Equal emphasis on practical transcription experience.

244. Ethnomusicalogical Methods: Field Research. (4) Course may be repeated for credit. Three hours of seminar per week. Formerly 235. Techniques, equipment, research and data collection, analysis, documentation, notation, transcription.

245. Organology. (4) Three hours of seminar per week. Formerly 205. A study of musical instruments from diverse perspectives including physical characteristics, classification systems, symbolism, iconography, and performance technique.

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.

248. Topics in Asian Music. (4) Course may be repeated for credit. Three hours of seminar per week. Formerly 233. A highly specialized course in ethnomusicology, dealing with the problems in research in music of Asian cultures. The topic will change each time the course is offered.

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 on assigned readings. In rotation members of the class will be appointed as respondents for the papers. (F,SP)

C291A. Oral Performance: Noetics and Poetics. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. Formerly 291A. This seminar will explore how oral performance traditions organize and manage knowledge. Emphasis will be placed upon the totality of the performance, with a focus upon music as a codeterminant of the meaning and a catalyst for composing the text. Also listed as Rhetoric C291A and Southeast Asian C291A. Staff

298. Group Special Studies. (2-8) Course may be repeated for credit. Meetings to be arranged according to units taken. Open to qualified students for research or creative work, including work on the doctoral dissertation. Such work shall not serve in lieu of regular courses of instruction. (F,SP)

299. Special Study. (2-12) Course may be repeated for credit. Meetings to be arranged according to units taken. Open to properly qualified graduate students for research or creative work, including work on the doctoral dissertation. Such work shall not serve in lieu of regular courses of instruction. (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. 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 requirements 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)

405A-405B. Elementary Piano. (111) One hour of class per week. Must be taken on a passed/not passed basis. Prerequisites: Open only to majors in music. Required of music majors who do not pass the entrance examination in piano. (F,SP) Bidwell, Chew

405C-405D. Elementary Piano. (111) One hour of class per week. Must be taken on a passed/not passed basis. Prerequisites: 405B is prerequisite to C; C is prerequisite to D; open only to majors in music. Required of music majors who do not pass the entrance examination in piano. (F,SP) Bidwell, Chew

415. Vocal Technique. (1) Course may be repeated for credit. One hour of lecture 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 technique, primarily for students in the University Choruses, covering techniques of breathing, pronunciation, and articulation. (F,SP)

Native American Studies

Program and Major Office: 506 Barrows Hall, (510) 642-6725
Chair: José David Saldivar, Ph.D.
Professors
Patricia Penn Hidalgo, Ph.D.
Terry Wilson (Emeritus), Ph.D.

Assistant Professors
Ninachka Hernandez, Ed.D.
Tiya Miles, Ph.D.
Darren Ranco, Ph.D.

Lecturer
Jean Molelesky, 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 Americans in the United States.

The curriculum has been structured to provide courses that are theoretical and practical in analysis of Native American cultures and contemporary legal and social institutions that affect Native American life. The program not only 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

Note: Some of the courses included in the major curriculum are pending approval. Please consult the online catalog or a departmental advisor for further information.

The major in Native American studies consists of 12 courses for a total of 48 units.

Lower Division. Ethnic Studies 10A, 10B; Native American Studies 20A, 20B.

Upper Division. Ethnic Studies 101A, 101B, 103; Native American Studies 110; completion of three courses from Native American Studies 100, 120, 151, and 178; Native American Studies 197 (4 units cumulative).

Honor Program

The Native American Studies Program provides a 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. To complete the major with honors the student will be required to undertake a 4-unit 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.

The Minor

Note: Some of the courses included in the minor curriculum are pending approval. Please consult the online catalog or a departmental advisor for further information.

Requirements: The minor in Native American studies consists of five upper division courses for a total of 20 units: Ethnic Studies 101A or 101B; Native American Studies 110; completion of three of the upper division courses listed in the major requirements (not including Native American Studies 197).

Lower Division Courses

R18. Native American Studies Reading and Composition. (4) 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 creative 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 tutorial per week. This course explores the interactions, from friendship treaties and land deals to contemporary American governmental policies, between America’s original inhabitants and American settlers. Emphasis will be placed on how tribal peoples continue to react to the national myths and policies created by Europeans and Euro-Americans. (F) 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 standards 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

Native American Studies / 347

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
71. Native Americans in North America to 1900. (4) Three hours of lecture and one hour of discussion per week. Formerly 71A. An ethnographic and ethnohistorical analysis of America’s original inhabitants and their interactions with Europeans and Euro-Americans emphasizing an Indian perspective. (F) Hilden

72. Native Americans in the 20th Century. (4) Three hours of lecture and one hour of discussion per week. Formerly 50 and 71B. A survey and analysis of federal-Indian relations and tribal sovereignty. (SP) Hilden

90. Freshman Seminar—Myth, Memory and History. (3) Three hours of seminar per week. Prerequisites: Limited to freshmen. The course will introduce students to different ways of understanding the history of American Indians and to basic resources and research methods for studying the history of Indian tribes. (SP) Vizenor

98. Supervised Group Study and Research. (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. Limited to men and sophomores. Supervised research by lower division students. (F,SP) Staff

Upper Division Courses

100. Native American Law. (4) Three hours of lecture per week. Prerequisites: 71, 72, or consent of instructor. Historical background of the unique relationship between the United States government and Native American communities. Examination of contemporary legal, political, and economic situations. (F) Vizenor

104. Native American Economic Development. (4) Three hours of lecture per week. Prerequisites: 71, 72, or consent of instructor. Functions of tribal economic life. Consideration of alternative economic policies on tribal lands and resources. Examination of policies affecting the lives of Native American social, political, and economic situations. (F) Vizenor

149. Gender in Native American Society. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. We shall examine changes in images of key figures and events constituting “our” collective historical memory. (F) Hilden

150. Native American Narratives. (4) Three hours of seminar per week. Prerequisites: Junior or senior standing and completion of 1A-1B. This workshop provides intensive study of the crafts of writing in relation to various Native American genres as well as writing and discussion of student work. (SP) Vizenor

151. Native American Philosophy. (3) Three hours of lecture per week. Prerequisites: 71 or consent of instructor. A study of the philosophical and metaphysical aspects of Native American world views, with emphasis on traditional knowledge, explanations of natural phenomena, and relations of human beings to nature through ritual and ceremonial observances. (SP) Vizenor

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 (aesthetic, linguistic, psychological, historical, and cultural) in examining American Indian literature. (SP) Vizenor

154. Mythic Tribal Literature. (4) Three hours of lecture per week. Prerequisites: 72. Chronicles and commentaries on published texts and the problems of tribal literature in translation. The cult of cultural tribal artifacts in contrast to the verbal act of sharing dreams and telling mythic tales. (SP) Hilden

155. Native American Medicine. (3) Three hours of seminar per week. Prerequisites: 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. (SP) Hilden

156. Native American Autobiographies. (4) Three hours of lecture per week. Prerequisites: 152 or consent of instructor. Native American Indian autobiographies as literature and comparative cultural histories; representational and postmodern themes, with critical and theoretical attention to tribal hermeneutics. (SP) Vizenor

157. Native American Simulations. (4) Three hours of lecture per week. Prerequisites: 72. Critical interpretation of simulations of tribal cultures and people, and theoretical considerations of representations in photographs, documentary films, advertising, and general literature, with close attention to the possession of images by photographers of Native American Indians. (SP) Vizenor

158. Native Americans and the Cinema. (4) Three hours of lecture per week. Prerequisites: 72 or consent of instructor. This course will analyze the sociological, psychological and anthropologic aspects of Hollywood moviemakers’ stereotypes of the American Indian through the history of film. The format will include representative Indian films, lectures, and guest speakers from the movie industry. (SP) Vizenor

175. History of Native Americans in California. (4) Three hours of lecture per week. Prerequisites: 71, 72, or consent of instructor. History of the Native Americans of California with emphasis on the lifeways, mores, warfare, and relations with the United States government. Attention will be given to the background and evolution of acculturation up to the present. (SP) Vizenor

176. History of Native Americans in the Southwest. (4) Three hours of lecture per week. Prerequisites: 71, 72, or consent of instructor. An historical analysis of the Native American Nations of the southwestern United States. (SP) Vizenor

177. Plains Indian History. (3) Three hours of lecture per week. Prerequisites: 71, 72, or consent of instructor. This course will cover the entire range of Plains Indian history from archaeological sites to the present. Consent of instructor. Students will write papers. (SP) Vizenor

178. Topics in Native American History. (4) Three hours of lecture 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 and regional case studies the course provides a rereading of much United States 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. (SP) Hilden, Miles

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 seminar per week. Prerequisites: Consent of instructor. The course provides intensive study in Native American Studies with topics to be announced at the beginning of each semester. (SP) Hilden

H195. Native American Studies Honors Course. (4) Course may be repeated for credit. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and upper division standing preferred. Individual conferences to be arranged. Supervised research required to specify aspects of the Native American community in off-campus settings. Regular individual meetings with faculty sponsor and written reports required. (SP, F,SP)

198. 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 the instructor and upper division standing preferred. Individual conferences to be arranged. Group discussion, research, and reporting on topics by students. (SP, F,SP)

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 and consent of instructor. Individual conferences to be arranged. The individual student, with consent and guidance of an instructor, researches an interest not covered in the courses offered in the Program. (SP, F,SP)

Natural Resources
(4) Three hours of lecture per week. Prerequisites: 71 or consent of instructor. Overview of U.S. economic policies and resources. Examination of the effect of federal legislation, Bureau of Indian Affairs regulations, and corporate interests on tribal economic life. Consideration of alternative strategies development of natural resources. (SP) Vizenor

101. Native American Tribal Governments. (4) Three hours of lecture per week. Prerequisites: 71, 72, or consent of instructor. Formerly 103. The roles of tribal governments in the formation of internal and external policies affecting the lives of Native American people, the basis for their political power historically and in contemporary society, and their structure and functions. (SP) Vizenor

104. Native American Economic Development. (4) Three hours of lecture per week. Prerequisites: 72 or consent of instructor. Analysis of impact of U.S. economic policies and resources. Examination of the effect of federal legislation, Bureau of Indian Affairs regulations, and corporate interests on tribal economic life. Consideration of alternative strategies development of natural resources. (SP) Vizenor

110. Theories and Methods in Native American Studies. (4) Three hours of lecture per week. Prerequisites: 71 or consent of instructor. An introduction to literary theory and criticism, historiography, and social sciences theories and methods useful in the study of Native American literature, history and contemporary tribal groups. Course will develop skills of information gathering and development of theories that structure information. (SP) Vizenor

145. Making History/Making “Indians.” (3) Three hours of seminar per week. Prerequisites: 71 or 72 or consent of instructor. This course explores the ways in which an invented, generic “Indian” has played a variety of roles in master narratives of United States history. We shall examine changes in images of key figures and events constituting “our” collective historical memory. (F) Hilden

149. Gender in Native American Society. (4) Three hours of lecture per week. Prerequisites: 71 or 72 or consent of instructor. This course examines gender roles from the point of view of the present. An emphasis will be placed on the ways in which contact with European gender practices transformed those prevalent in Native North American before the conquest.

Natural Resources (College of Natural Resources)

Office of Instruction and Student Affairs: 137 Giannini Hall, (510) 642-7177 http://www.cnr.berkeley.edu/

Dean: Richard Malkin, Ph.D.

Associate Dean—Instruction and Student Affairs: Don Dahlsen, Ph.D.

Associate Dean—Academic Affairs: Richard Malkin, Ph.D.

Associate Dean—Research: Barbara Allen-Diaz, Ph.D.

Overview

Teaching and research in the College of Natural Resources (CNR) integrate the natural and social sciences to address ecological problems in urban and rural landscapes, agriculture, rangelands, and woodlands. The mission of the college are to increase knowledge and understanding of ecosystems, promote sustainable use of natural resources, and provide the foundations of sustainable and equitable environmental management. The College of Natural Resources has intellectual roots in two former campus units—the College of Agricultural Sciences and the School of Forestry and Conservation—which were combined in 1974 to provide a broad interdisciplinary approach to natural resource problems. In 1993 the college was reorganized again, paring eight departments to four in order to better integrate natural and social sciences and to focus on undergraduate teaching.
Undergraduate and graduate programs are available in four departments: Agricultural and Resource Economics; Environmental Science, Policy, and Management (ESPM); Nutritional Sciences and Toxicology; and Plant and Microbial Biology. Agricultural and Resource Economics, the College of Natural Resources and the College of Letters and Science jointly offer an undergraduate interdisciplinary major in environmental sciences.

The Department of Agricultural and Resource Economics provides a basic foundation in economics and policy analysis, as applied to the management and conservation of natural and environmental resources. The Department of Environmental Science, Policy, and Management (ESPM) offers coordinated, interdisciplinary learning that addresses environmental problems. Its faculty is drawn from former departments of Conservation and Resource Studies, Entomology, Forestry and Resource Management, Plant Pathology, and Soil Science.

The Department of Nutritional Science and Toxicology provides basic study of nutrition and toxicology of foods and food science and a professionally accredited undergraduate program in clinical dietetics. The Department of Plant and Microbial Biology has a strong focus on basic plant biology from the molecular to the organismal levels, with a direct connection to plant biotechnology.

Environmental sciences is an interdisciplinary major that deals with a wide variety of issues arising from human interactions with natural systems. An interdepartmental and intercollege faculty committee supervises the major.

Undergraduate Programs

Undergraduate programs in the college fall into three categories. Some are prescribed professional programs designed for students with interests in specific professions, such as forestry and nutrition. Some are interdisciplinary programs that prepare students for graduate and professional programs in biology, health sciences, or economics. Most are integrative programs that emphasize flexible, interdisciplinary approaches and prepare students for employment or graduate study in areas such as land management, law, public policy, medicine, and environmental planning.

The Department of Agricultural and Resource Economics offers an undergraduate major in environmental economics and policy. The core of the program provides a fundamental education in economics and statistics, with a focus in mathematics. In addition, students integrate the rationality of economics with an understanding of the way natural resource systems work. They develop a sense of how the choices people make affect the environment, of the conflict between economic development and environmental quality, and of how the conflict can be resolved. Students are encouraged to use conditions in California as a learning tool.

The Department of Environmental Science, Policy, and Management (ESPM) offers coordinated, interdisciplinary learning that addresses environmental problems. The current majors are conservation and resource studies, forestry, molecular environment, and environmental resource management. Further information can be obtained from the Undergraduate Student Service Office in 260B Mulford Hall.

Conservation and resource studies is designed for students interested in the interaction between issues of sustainable development, population, technology, economics, cultural values, and societal institutions. The program emphasizes a social science foundation in the lower division years; in their junior and senior years, students create, in conjunction with faculty, and upper division plan which defines their course work for the remainder of their undergraduate study. The program is ideal for highly motivated students who have strong ideas about where they want to make an impact.

The current major in forestry is designed to prepare students to manage forests and wildlands to produce wood, water, forage, wildlife, recreational opportunities, and environmental benefits. Graduates are employed by various international, federal, state, local, and private agencies and organizations.

The molecular environmental biology (MEB) major is designed to expose students to the organization and function of biological organisms at the molecular, cellular, organismal, and ecological levels. The breadth of this vertically integrated program provides valuable experience for students interested in how organisms function in their environment. This major is appropriate for pre-med and pre-vet students, students interested in graduate education in a biodiversity context, as well as students interested in general biology. Students may choose among four areas of emphasis: Ecology; Environment and Human Health; Microbiology; Animal Health and Behavior; and Host-Parasite Relationships and Pest Management.

The major in resource management incorporates sociology, diverse other social sciences, and public policy into a strong science curriculum. The interdisciplinary major trains students to make decisions about employment and human activities in the face of changing demographics and societal values. Undergraduates are required to take a summer field program in which they spend eight weeks in a CNR’s summer camp analyzing an ecosystem and its historic and current use, making decisions about its management, and creating a workable management plan.

The Department of Nutritional Sciences and Toxicology offers an undergraduate major, nutritional sciences, with three tracks: Physiology and Metabolism, Dietetics, and Toxicology. Track I, Physiology and Metabolism, combines a strong foundation in natural sciences with advanced course work in nutrition, the biochemical and physiological study of nutrient utilization; and food science, the study of properties and processing of food materials. Under Track II, Dietetics, students at the junior and senior levels take course work emphasizing nutrition and the application of this knowledge through dietetic practice. Track III, Toxicology, provides students with a strong background in the biological and chemical sciences with advanced course work focusing on nutrition and toxicology, the biochemical and physiological study of the adverse effects of nutrients in the diet. Professional career opportunities are described under the Nutritional Sciences section of this catalog.

The Department of Plant and Microbial Biology offers a major in genetics and plant biology that combines biology and plant sciences—physiology, biology, and anatomy—with newer biological disciplines such as genetics, molecular biology, and biochemistry. The major is split into two tracks: Plant Biology and Plant Genetics. The Plant Biology track concentrates on the spectrum of cellular and organismal aspects of plants; Plant Genetics focuses on cellular development, molecular genetics, and agricultural biotechnology. Both recognize the role plants play in the global environment.

The major in environmental sciences is available in both the College of Natural Resources and the College of Letters and Science. The major curriculum emphasizes a basic foundation 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 choose an emphasis in biological science, physical science, or social science. The major culminates with a senior research project.

Major Requirements. Detailed course requirements for each major, along with college requirements for the B.S. degree, are listed in the Announcement of the College of Natural Resources, available from the Office of Instruction and Student Affairs. University of California, Berkeley, 137 Giannini Hall #3100, Berkeley, CA 94720-3100. For further information, call the Office of Instruction and Student Affairs at (510) 642-0542 or visit the web site at http://www.cnr.berkeley.edu/sao/.

Minor Programs. The college offers minors in conservation and resource studies, forestry, environmental economics and policy, and nutritional sciences. For information, please contact the appropriate departmental office.

Undergraduate Advisers. Undergraduate advisers in each major serve as a crucial link between students and the college. Advisers are available throughout the year to discuss major requirements and to assist students in planning a program best suited to their individual needs and interests. All students are required to see their advisers—at least once each semester in connection with the registration periods—for advice and consent in planning their academic programs.

Tele-BEARS Registration. Students must have an adviser’s approval before filing their Tele-BEARS registration lists. The minimum course load for students is 13 units. Exceptions require either signed approval of the Registrar (1) an added class; (2) a part-time status form on file, or (3) authorization from the Dean’s Office. For further information, contact the Dean’s Office, Office of Instruction and Student Affairs, (510) 642-0542.

Graduate Programs

Academic and professional graduate degree programs in environmental and natural resource management; agricultural and resource economics; comparative biochemistry; environmental science, policy, and management; forestry; nutrition; microbiology; plant biology; and range management. In addition, an interdisciplinary doctoral program is offered.

Inquiries regarding details of the various graduate programs may be directed to the appropriate graduate adviser in the chosen field.

Organizational Units

Agricultural and Resource Economics
Department Office: 207 Giannini Hall, (510) 642-3934
Chair: Anthony C. Fisher, Ph.D.

Environmental Science, Policy, and Management
Department Office: 145 Giannini Hall, (510) 643-8074
Chair: James Bartolome, Ph.D.

Environmental Sciences
Department Office: 260A Mulford Hall, (510) 643-4647
Director: Brian Wright, Ph.D.

Nutritional Sciences and Toxicology
Department Office: 119 Morgan Hall, (510) 642-6490
Chair: Leonard Bjeldanes, Ph.D.

Plant and Microbial Biology
Department Office: 111 Koshland Hall, (510) 642-5167
Chair: Andrew Jackson, Ph.D.

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
The Department of Naval Architecture and Offshore Engineering (College of Engineering) states that students interested in an undergraduate program of study in ocean engineering should consult the Ocean Engineering section of this catalog. The Department Office at 250 Barrows Hall, (510) 642-3757, and Chair, Ronald S. Hendel, Ph.D., offer 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. 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

The Major in Near Eastern Studies

Major guidelines for each discipline are available in the departmental office. With the consent of the department, portions of the requirements may be fulfilled by related courses in other departments. In Arabic, Hebrew, Persian, and Turkish: Prerequisite: the elementary courses in the language, or their equivalents. It is recommended that these be taken beginning in the freshman year. The major requires from 21 to 25 upper division language units, depending upon the language undertaken, plus 6 upper division lecture units and NES 10.

In Assyriology and Hittitology, Old Iranian Studies, and Egyptology: A basic reading knowledge of German is recommended. The major requires from 22 to 26 upper division language units, depending upon the language undertaken, plus 6 upper division lecture units or 8 in Egyptology and NES 10.

The Major in Ancient Near Eastern Archaeology and Art History

Mesopotamian Archaeology. Three lower division courses are required inclusive of NES 10, 15 or 25; 16 or 18. The student must complete 28 upper division units from the following list: NES 120A-120B, 121A-121B, 122A-122B, 123A-123B, 124A-124B. If, and only if, the courses listed above are not available during the student’s junior and senior years, the student may select any language or lecture course in the field of ancient Near Eastern Studies.

Egyptian Archaeology. This option requires that students take NES 10, 18, 102A-102B, and Egyptian 100A-100B, 101A-101B, NES 15, 20, and Anthropology 2 are highly recommended. In addition, students must take 8 upper division units from the following list: NES 101A-101B, 103, 104, 106A-106B, 120A-120B, 121A-121B, 122A-122B, 123A-123B, 124A-124B. Anthropology 134, 135, 137, 139 is not required, the department does recommend some background in French, German, and/or Arabic.

The Major in Ancient Near Eastern Civilizations

Prerequisites for the major are NES 10, 15, or 18, and approval of the student’s proposed program of study by the undergraduate adviser. The requirements for the major are NES 100A, 108; five upper division courses relating to the student’s major focus (normally selected from a list available in the department office), and one upper division course dealing with a culture or discipline outside the student’s primary focus (selected from the same list) for a total of eight upper division courses or 24-35 units.

Honor Program

With the consent of the undergraduate adviser, a student with an overall grade-point average of 3.3 or higher in courses completed in the major may apply for a Natural Resources degree with Honors. This requires an overall grade-point average of 3.5 or higher in courses completed in the major may apply for a Natural Resources degree with Honors.
Graduate Degrees

Applicants for graduate study should have fulfilled the equivalent of the departmental 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 which 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 departmental course work requirements for graduate degrees.

The M.A. Degree. The M.A. is obtained according to Plan I or Plan II as outlined below. A complete description of Graduate Division requirements for this degree is available in the Graduate Education section of this catalog. In addition to the requirements outlined for the plan adopted, students must pass a reading examination in either French or German (another language may be substituted on approval of the major adviser).

Plan I: This plan is an option for the departmental courses in Mesopotamian archaeology and art history. The plan requires an M.A. thesis, 20 units of course work, and an oral defense of the thesis.

Plan II: This plan is required for all other programs and is intended for the archaeology option in Near Eastern archaeology and art history. The plan requires at least 24 units of course work, including work in one major and one secondary Near Eastern language. Two courses may be independently or in connection with course work will also be required. Written comprehensive examinations are required of all students to test (a) working knowledge of pertinent languages and general knowledge of the history and civilization of an area of emphasis; (b) knowledge of other subjects suggested by the student’s degree committee.

The Ph.D. Degree. Students must have completed an appropriate M.A. program to be eligible for the Ph.D. program. The student must first, for program approval, pass a reading examination in either French or German (another language may be substituted on approval of the graduate adviser). The Ph.D. degree depends on successful completion of the following requirements: (1) Ph.D. course work; (2) reading examinations in French and German (proficiency in one or two Near Eastern languages, as required for the student’s field of study 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 preliminary examinations, which will cover at least two Near Eastern languages. For Egyptian archaeology and art history majors, proficiency will be tested through a written examination in 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 ar- chaeology) who have not completed a minimum of two years of course work in an ancient or modern Near Eastern language must pass a proficiency 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 requirements for the dissertation as outlined in the Graduate Education section of this catalog. For further information on these graduate programs, contact the graduate assistant in 250 Barrows Hall.

Special Programs

The Joint Doctoral Program in Near Eastern Religions. This program, which combines the faculty and library resources of the University of California, Berkeley, and the Graduate Theological Union, is a flexible course of study, probing in depth the archaeology, history, languages, literatures 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 intermediate degree. Applicants must be admitted into both the Graduate Theological Union and the University of California, 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. Applicants will be admitted into both the Center for Jewish Studies of the Graduate Theological Union and the University of California. The degree is conferred jointly by the two institutions.

The Graduate Program in Ancient History and Mediterranean Archaeology (see index for the location of a full description of this program) is available to students with backgrounds in ancient history, Near Eastern Studies, and Egyptology. Members of the Department of Near Eastern Studies are members of the faculty group for this program.

Near Eastern Studies

Courses listed under Near Eastern Studies are taught in English. Course headings are language courses and assume an appropriate level of knowledge of that language.

The Schedule of Classes issued before each semester, and listings posted at the department office, provide further detailed information about the courses offered by the Department of Near Eastern Studies, including when and by whom each course will be given.

Lower Division Courses

R1A-R1B. Reading and Composition in Ancient Near Eastern Texts. (4;4) Three hours of lecture and one hour per week. Prerequisites: Subject A examination or course. 1A is a prerequisite to 1B. Reading and writing is based on a selected group of masterpieces of the ancient Near East in translation, such as the Bible, Code of Hammurapi, Epic of Gilgamesh, etc. Satisfies the Letters and Science Reading and Composition requirement. (F,SP) Staff

R2A. Reading and Composition in Modern Middle Eastern Texts. (4) Three hours of lecture and one hour per week. Prerequisites: Subject A examination or course. Expository writing based on analysis of selected Middle Eastern literatures in translation, such as Arabic, Hebrew, Persian, Turkish prose and/or poetry. Satisfies the first half Reading and Composition requirement. (F,SP) Staff

R2B. Reading and Composition in Modern Middle Eastern Texts. (4) Three hours of lecture and one hour per week. Prerequisites: Subject A examination or course. 1A or equivalent course is prerequisite to 2B. Expository writing based on analysis of selected modern Middle Eastern literatures in translation such as Arabic, Hebrew, Persian, Turkish prose and/or poetry. Satisfies the second half of the Reading and Composition requirement. (F,SP) Staff

10. Introduction to the Near East. (4) Three hours of lecture and one hour per week. Prerequisites: C. The background and present status of the ethnic and religious groups in the Arab states, Turkey, Israel, and Iran. (F)

15. Introduction to Near Eastern Art and Archaeology. (4) Three hours of lecture and one hour of discussion per week. The civilizations of Western and
Central Asia from preliterate times to the Persian Empire.

C16. Introduction to Islamic Art. (4) Three hours of lecture and one hour of discussion per week. An introduction to the art and architecture of Islamic lands from the seventh to the 17th centuries and to the practice of art history. Also listed as History of Art C16.

18. Introduction to Egyptology. (4) Three hours of lecture and one hour of museum study per week. A survey of the art and architecture of dynastic Egypt and their relations to the social and political institutions of the time. (F,SP)

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/no pass basis. The Berkeley 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. Berkeley Seminars are offered in all campus departments, and topics vary from department to department to semester.

C26. Introduction to Central Asia. (3) Three hours of lecture per week. Formerly 26. This course will introduce the student not only to ancient and modern Central 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, and religious traditions of the region and will acquaint the student with the historical foundations of some of the political, social and economic challenges for contemporary post-Soviet Central Asian republics. Also listed as Geography C55.

34. Hebrew Bible in Translation. (3) Three hours of lecture per week. Readings from the Hebrew Bible in English translation. (F,SP)

C39. Imagining Arab Civilization. (4) Three hours of lecture and one hour of discussion per week. Formerly 92. This course examines major aspects of Arab culture through literature, art, film, and other media. Questions of religious, political, and philosophical nature co-exist in Arab culture with literary conventions and aesthetic norms. The course explores the dynamic interaction among these abiding concerns of Arab culture from pre-Islamic times to the present.

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. One contact hour per week per unit. Must be taken on a passed/not passed basis. Lower division standing. Student must submit a written proposal with consent of instructor to the department chair for approval. Topics vary.

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. Pre-requisites: Lower division standing; 3.3 GPA and consent of instructor. Chronological survey of the history of ancient Egypt from prehistoric times down to the conquest of Alexander the Great. Special emphasis will be given to current archaeological theories and the results of the excavations. Textile use will be made of the Hearst Museum collection.

100A-100B. Archaeology of Ancient Egypt. (4;4) Three hours of lecture and one hour of museum section per week. Three hours of lecture and one hour of discussion per week. The course will treat in detail topics in Islamic architecture and topics in Islamic art. Subjects addressed may include painting, calligraphy, and book production. Also listed as History of Art C121A.

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 treat in detail topics in Islamic architecture and topics in Islamic art. Subjects addressed may include painting, calligraphy, and book production. Also listed as History of Art C121B.

122A-122B. Iranian Archaeology. (4;4) Three hours of lecture and one hour of discussion per week. A survey of the archaeology of Iran from Paleolithic times down to the Sasanian period.

123B. Mesopotamian Archaeology. (4) Three hours of lecture and one hour of discussion per week. A survey of the archaeology of Mesopotamia.

124A-124B. Archaeology of the Southern Levant. (3;3) Three hours of illustrated lecture per week. The course provides a general survey of the archaeology of the Southern Levant (Israel, Jordan, Lebanon, Syria, Palestine) from the Neolithic to the Roman period. Also listed as Religious Studies C103.

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/no pass basis. The Berkeley 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. Berkeley Seminars are offered in all campus departments, and topics vary from department to department to semester.

C26. Introduction to Central Asia. (3) Three hours of lecture per week. Formerly 26. This course will introduce the student not only to ancient and modern Central 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, and religious traditions of the region and will acquaint the student with the historical foundations of some of the political, social and economic challenges for contemporary post-Soviet Central Asian republics. Also listed as Geography C55.

34. Hebrew Bible in Translation. (3) Three hours of lecture per week. Readings from the Hebrew Bible in English translation. (F,SP)

C39. Imagining Arab Civilization. (4) Three hours of lecture and one hour of discussion per week. Formerly 92. This course examines major aspects of Arab culture through literature, art, film, and other media. Questions of religious, political, and philosophical nature co-exist in Arab culture with literary conventions and aesthetic norms. The course explores the dynamic interaction among these abiding concerns of Arab culture from pre-Islamic times to the present.

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. One contact hour per week per unit. Must be taken on a passed/not passed basis. Lower division standing. Student must submit a written proposal with consent of instructor to the department chair for approval. Topics vary.

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. Pre-requisites: Lower division standing; 3.3 GPA and consent of instructor. Chronological survey of the history of ancient Egypt from prehistoric times down to the conquest of Alexander the Great. Special emphasis will be given to current archaeological theories and the results of the excavations. Textile use will be made of the Hearst Museum collection.

100A-100B. Archaeology of Ancient Egypt. (4;4) Three hours of lecture and one hour of museum section per week. Three hours of lecture and one hour of discussion per week. The course will treat in detail topics in Islamic architecture and topics in Islamic art. Subjects addressed may include painting, calligraphy, and book production. Also listed as History of Art C121A.

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 treat in detail topics in Islamic architecture and topics in Islamic art. Subjects addressed may include painting, calligraphy, and book production. Also listed as History of Art C121B.

122A-122B. Iranian Archaeology. (4;4) Three hours of lecture and one hour of discussion per week. A survey of the archaeology of Iran from Paleolithic times down to the Sasanian period.

123B. Mesopotamian Archaeology. (4) Three hours of lecture and one hour of discussion per week. A survey of the archaeology of Mesopotamia.

124A-124B. Archaeology of the Southern Levant. (3;3) Three hours of illustrated lecture per week. The course provides a general survey of the archaeology of the Southern Levant (Israel, Jordan, Lebanon, Syria, Palestine) from the Neolithic to the Roman period. Also listed as Religious Studies C103.

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/no pass basis. The Berkeley 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. Berkeley Seminars are offered in all campus departments, and topics vary from department to department to semester.

C26. Introduction to Central Asia. (3) Three hours of lecture per week. Formerly 26. This course will introduce the student not only to ancient and modern Central 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, and religious traditions of the region and will acquaint the student with the historical foundations of some of the political, social and economic challenges for contemporary post-Soviet Central Asian republics. Also listed as Geography C55.

34. Hebrew Bible in Translation. (3) Three hours of lecture per week. Readings from the Hebrew Bible in English translation. (F,SP)
151. Folktales of the Middle East. (4) Three hours of lecture and one hour of discussion per week. An analysis of modern Jewish movements and ideas. Topics include Spinoza, Hasidism, the Enlightenment, Jewish religious movements in America, Zionism, Buber, Rosenweig, Kaplan, Heschel.

137. Modern and Contemporary Jewish Thought. (4) Three hours of lecture and one hour of discussion per week. An investigation of the concepts of the hero/heroine in the literature of ancient Mesopotamia, Canaan, and Israel. The importance of heroic epic in defining and explaining morality, the self, and the cosmos will be a guiding concern. Texts include the epics of Gilgamesh and Aqhat, the Hebrew Bible, and the New Testament. All texts are read in translation. (F,SP) Staff

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 order (the Qadiriyya) in the elaboration 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. (F,SP) Staff

146A-146B. Islam. (3,3) Three hours of lecture per week. A close and detailed introduction to the sources, practices, and institutions of Islam, together with their historical development and elaboration in a select number of ethnic and geographic environments and an overview of Islam in the world today.

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 an Islamic empire and its effects on the societies it governed; the creation of an Islamic civilization and the religious, political, and intellectual development that occurred in contact with Europe and the Arabic through trade, Crusades, and nomadic conquest; the contributions of non-Muslims, women, slaves. (F,SP) Staff

150A. Arabic Literature in Translation. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. No knowledge of Arabic is required.
A. Survey of Arabic literature from its origins in pre-Islamic poetry through its historical development during the Umayyad, and Abbasid periods.
B. Survey of Arabic literature in its development from the post-Abbasid period to the present.

151. Folktales of the Middle East. (4) Three hours of lecture and one hour of discussion per week. An introduction to the art of the folktale as practiced in the folk narrative traditions of the Middle East. We will first focus on the cultural dynamics of the Arabic folktale: its place in the larger conflicts and gender roles; its use of imagery, symbolism and the supernatural; and its translation of cultural themes like fate and destiny into plot motifs. We will then compare the Arabic folktale to the oral genres of tales from other traditions including Turkish and Persian.

152. Cultural Encounters in Modern Arabic Literature. (3) May be repeated for credit when subject matter varies. Three hours of lecture per week. This course is organized around two broad but inter-related issues: the quest for identity and the representation of the “other” in modern Arabic literature. Central to both concerns is the treatment of colonialism, nationalism, and gender in modern Arabic literature and Arab culture in general. (F,SP)

153. The Medieval Framatelite Genre: Its Hispanic-Arabic Roots. (4) Three hours of lecture per week. The art of inserting stories within stories is typical of certain Oriental literatures and was widely cultivated in Arabic. Via Spain, the Arabs transmitted this form of writing to medieval Europe. A masterpiece such as the Libro de buen amor by Ibn Hazm is an elaborated work in Spanish literature, nevertheless bears comparison with certain Arabic works that preceded it. This course will study the structure, meaning, and function of the medieval frame tales as represented in Spanish genre stories from Arabic, and also in English, including animal fables, romances, miracles for princes, and picaroesque narratives. It will examine the Arabic literature Spanish borrowed, and show how, from Spain, individual tales found their way into the medieval West.

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 investigate how the Nights was transmitted, translated, and received in Europe, as a window on 19th-century gender and cultural relations, especially Western views of the “oriental” other. How the Nights was creatively manipulated by Western writers will be studied, as will the influence of these tales on modern Arabic literature itself. Several of the Nights have been represented in Western films will be considered. All works will be read in English translation.

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 relevance of Iranian religion for the history of Hellenistic Gnosticism, Judaism, and Islam.

162A. History of Persian Literature. (3) Three hours of lecture per week. A. Classical Persian literature from Firdawsī to the 15th century. B. Persian literature from the 15th century to the contemporary period. (F,SP)

173A-173B. Topics in the History of Central Asia and the Turks. (3,3) Course may be repeated for credit as topic varies. Three hours of lecture per week. A survey of the main themes in the cultural, ethnic, and linguistic history of Central Asia and adjacent regions, principally from the rise of Islam down to the present. The first half of the course deals with the Turkic and Iranian ethnic elements in Central Asia, and particularly with the Tajiks. The second half will be devoted to the Turks, including their history and expansion, not only in Central Asia but also in Anatolia and Southwest Europe.

174. Law and Society in the Early Modern Middle East. (3) Three hours of lecture per week. This course examines the social and religious lives of women and men through the lens of the law. A major concern is the relationship between law and culture, namely, the ways in which the law reflected ideals and tensions ranging from ideological competition between states to the problems of ordinary townspeople and peasants. In analyzing actual court cases, we will ask how individuals participated in the life of the court, and how they used the court to articulate their own self-interest and sense of moral worth. Readings will be in English. Students wishing to work with sources in the original Ottoman Turkish may enroll in this section. (F,SP) Staff

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.

185. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Instructed in areas not covered by regularly scheduled courses: Phoenician, Cypriote, Syrian Archaology.

219. 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 the General Catalog. (F,SP) Staff

220. 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 development of various disciplines and careers, and acquaint students with the rapidly changing world of Near Eastern studies. (F,SP) Staff

220A-220B. Seminar in Near Eastern Art. (4,4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. Graduate seminar on changing topics involving ancient Egyptian art and sites to be determined each year. Students taking the seminar only will receive 2 units only.

223A-223B. Seminar in Near Eastern Archaeology. (2,2) 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 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.

290A. Near Eastern Studies. (1-5) F,SP
290B. Arabic. (1-5)
290C. Cuneiform. (1-5)
290D. Egyptian. (1-5)
290E. Hebrew. (1-5)
290F. Iranian. (1-5)
290G. Semitics. (1-5)
290H. Turkish. (1-5)

292. Museum Internship. (1) Course may be repeated for credit. Ten to fifteen hours per week of curatorial work. May be taken on a satisfactory/unsatisfactory basis. Jointly supervised by a professional staff of a participating museum and a faculty member in the Art and Archaeology division of the Department of Near Eastern Studies.

295. Supervised Field Research in Archaeology. (2-12) Course may be repeated for credit. Two to twelve 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. Two units to be graded on a letter-graded basis. Prerequisites: 102A-102B or 106A-106B or consent of instructor. Topics including ancient Egyptian art and archaeology. Focus may be regional, chronological, methodological, and/or thematic. (F,SP)

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. Two units to be graded on a satisfactory/unsatisfactory basis. Four units to be graded on a letter-graded basis. Prerequisites: 102A/B, 104A/B or the equivalent; consent of instructor. Topics including ancient ceramics, stressing the relationship between pottery on the one hand, and archaeological practice and research in Egypt and/or the Levant on the other hand.
Emphasis is placed on the relationship between pottery and broader issues involving the history and culture of these regions. Where appropriate, extensive use is made of slides and "hands-on" experience with available ceramic collections (e.g., Hearst Museum collection.)

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. Individual Research. (4-12) Course may be repeated for credit. Individual conferences. Prerequisites: Successful completion of Ph.D. qualifying exams; limited to students engaged in research for the doctoral dissertation.

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 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) 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. May not be used for unit or residence requirements for the doctoral degree.

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 the functional usage of Arabic in the context of 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.

20A-20B. Intermediate Arabic. (5:5) Five hours of recitation per week. Prerequisites: 1B or equivalent; 20A is a prerequisite to 20B. This course is proficiency oriented. Authentic reading in modern standard and classical Arabic is emphasized. 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 for 100B. Intensive reading and analysis of texts of different genres. Guest lectures, films, documentaries, oral presentations, research papers, formal and informal styles of writing and correspondence. Extensive vocabulary building.

104A. Modern 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 contemporary prose. Reading and analysis of modern Arabic fiction, including short stories, drama, the novel, and expository prose.

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 primary texts of various genres, including prose, biography, and travel literature.

105A. Modern 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 20th-century Arabic poetry.

105B. Classical Arabic Poetry. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: Arabic 20B or equivalent. Readings and analysis of poetry from the pre-Islamic through the classical periods.

107. Arabic Historical and Geographical Texts. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 20B or equivalent. Readings from the classical historians and geographers and from contemporary scholarship. Development of historiography.

106. Islamic Religious and Philosophical Texts in Arabic. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 20B or equivalent. Readings in the basics texts of Islam (Qur'an, Hadith, Sira, commentary) and in theological, mystical, and philosophical texts.

118. Survey of Arabic Literature (in Arabic). (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 thirteenth 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 thirteenth century to the present.

120A-120B. Styles of Arabic. (3:3) Course may be repeated for credit when subject matter varies. Three hours of lecture per week. Prerequisites: 105 or the equivalent. A survey of Arabic writing styles from pre-Islamic times to the present. Through representative selections from pre-Arabic poetry, the Qur'an, Hadith, medieval and modern literary and non-literary texts, this course introduces the student to the major conventions of Arabic composition. Regular readings drawn from the Arabic press will complement the chronological/stylistic survey and add a comparative perspective to it.

196. 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 restrictions apply: see the Introduction to Courses and Curricula section of this catalog. (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 restrictions apply: see the Introduction to Courses and Curricula section of this catalog. (F, SP)

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 selected grammatical phenomena of Arabic based on readings from the classical Arabic grammarians, on the modern study of linguistics in the Arabic world, and on the Western grammatical tradition.

201. Arabic Dialectology. (3) Course may be repeated for credit when topics vary. Three hours of lecture per week. Prerequisites: 20B or its equivalent or consent of instructor. The relationship of Classical Arabic and the Semitic languages; sociolinguistics of diglossia; the emergence of Educated Spoken Arabic and the future of Arabic.

202. History of Arabic. (3) Course may be repeated for credit when topics vary. Three hours of lecture per week. Prerequisites: 20B or its equivalent or consent of instructor. The history of Arabic from its Semitic antecedents through the formation of the modern dialects.

209A-209B. Readings in the Qur'an. (3:3) Course may be repeated for credit as texts vary. Three hours of reading per week. Prerequisites: Three years of Arabic. Selected readings in Arabic from the Qur'an, traditional Islamic exegesis, and other secondary materials.

210. Topics in Modern Arabic Literature: Poetry. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 109. Intensive study of modern poetry in relation to the cultural tradition.

212. Topics in Modern Arabic Literature: Prose. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 110. Intensive study of modern prose in relation to the cultural tradition.

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 and careful literary analysis of significant authors and specific topics in Classical Arabic prose or poetry or both.

221. Seminar in Non-Classical Arabic Literature. (1-4) Course may be repeated for credit when topics vary. Three hours of seminar per week. Prerequisites: 20B or its equivalent and consent of instructor. A close reading and careful literary analysis of significant authors and specific topics in non-Classical Arabic literature.

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. A close reading and careful literary analysis of significant authors and specific topics in modern Arabic literature.

Cuneiform

Upper Division Courses

301A-301B. Teaching Arabic. (3:3) One hour of lecture per week plus participation in demonstration classes and colloquia. Must be taken on a satisfactory/unsatisfactory basis. The methodology of teaching Arabic as a foreign language at the college level. Lectures on contrasting analysis of English and Arabic, and classroom strategies, and the development of instructional materials. Required of all new graduate student instructors in Arabic.

301A-301B. Teaching Arabic. (3:3) One hour of lecture per week plus participation in demonstration classes and colloquia. Must be taken on a satisfactory/unsatisfactory basis. The methodology of teaching Arabic as a foreign language at the college level. Lectures on contrasting analysis of English and Arabic, and classroom strategies, and the development of instructional materials. Required of all new graduate student instructors in Arabic.

302A-302B. Teaching Cuneiform. (3:3) Three hours of lecture per week. Prerequisites: Background in German and French recommended. Introduction to Cuneiform script and grammar, reading of selected Cuneiform texts. Sequence begins in fall. Offered alternate years.

101A-101B. Intermediate Akkadian. (3:3) Three hours of lecture per week. Prerequisites: 100A-100B: background in German and French recommended. Reading of selected texts, including law codes, letters, myths, and epics. Sequence begins in fall. Offered alternate years.

103B. Intermediate Sumerian. (3) Three hours of lecture per week. Prerequisites: 102A-102B: background in German and French recommended. Reading of texts selected for clarity of script, simplicity of vocabulary, and historical and cultural significance.

106A-106B. Elementary Hittite. (5:5) Four hours of lecture per week. Prerequisites: 100A-100B: background in German and French recommended. Introduction to Cuneiform Hittite language and grammar with reading of selected historical and religious texts.

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 the General Catalog.
Graduate Courses

200A-200B. Advanced Akkadian. (3;3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101A-101B. Reading of a variety of genres of Akkadian documents and literature. Texts selected are based on the individual needs of participating students.

206A-206B. Advanced Hittite. (3-3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 106A-106B. Reconstruction and critical reading of Hittite texts belonging to different literary genres (epics, mythology, annals, law codes, political treaties, rituals, etc.) or introduction to Hieroglyphic Luwian.

210A-210B. Advanced Sumerian. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 103A-103B. Reading of selected texts with the purpose of initiating students into the diverse genres of Sumerian literature.

298. Seminar. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. Special topics in Cuneiform. Topics vary and are announced at the beginning of each semester.

**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.

Graduate Courses


202A-202B. Egyptian Texts. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 202A-202B or consent of instructor. Philological analysis of texts of a single genre and period.

298. Seminar. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. Special topics in Egyptian. Topics vary and are announced at the beginning of each semester.

**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, Tosefta, Talmud, and Midrash) and an introduction to the languages of rabbinic texts.

104A-104B. Modern Hebrew Texts. (3,3) Course may be repeated for credit with different topic and consent of instructor. Three hours of lecture per week. Prerequisites: 100A-100B or equivalent. An introductory study of selected topics in Hebrew literature from the European Enlightenment to contemporary Israeli poetry and fiction.

105A. 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.

106A-106B. Elementary Biblical Hebrew. (3,3) Three hours of lecture per week. Formerly 2A-2B. An introduction to the language of the Hebrew Bible. (F,SP) Staff

107A-107B. Biblical Hebrew Texts. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 20A-20B. Formerly 101A-101B. The tools and procedure of biblical exegesis applied to simple narrative texts. (F,SP) Staff

148A-148B. The Art and Culture of the Talmud: Advanced Textual Analysis. (3,3) Course may be repeated for credit. Prerequisites: 102A-102B or consent of instructor. In this course, we will read and analyze closely talmudic texts in the original languages—Hebrew and Aramaic—together with selected medieval commentaries. The primary focus of the course will be on the acquisition of facility in reading the Talmud, comprehension of philosophical and historical issues and methods of study, as well as understanding the formative relation of the Talmud to the structures and practices of traditional Jewish cultures. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a pass/fail basis. Enrollment is restricted by regulations shown in the General Catalog.

Graduate Courses


202A-202B. Advanced Late Antique Hebrew Texts. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101A-101B. The study of the development of the Talmud to the structures and practices of traditional Jewish cultures. (F,SP) Staff

203A-203B. Advanced Medieval Hebrew Texts. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 103A-103B and 102A-102B. Literary analysis of belletristic Hebrew texts, either prose or poetry, chiefly from the medieval period.

204A-204B. Advanced Modern Hebrew Texts. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 105A-105B and one of 101A-101B, 102A-102B, or 103A-103B. Selected topics in the development of Hebrew literature from the European Enlightenment to contemporary Israeli poetry and fiction.

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.

**Persian and Iranian**

**Persian**

Lower Division Courses

200A-200B. Intermediate Modern Persian. (5,5) Five hours of lecture per week.

Upper Division Courses

100A-100B. Intermediate Modern Persian. (5,5) Five hours of lecture per week. Prerequisites: 101A-101B or equivalent. Sequence begins Fall.

101A-101B. Selected Readings in Persian Literature. (3,3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 100A-100B or equivalent. Readings in both prose and poetry, drawn chiefly from modern Persian literature, designed to increase reading skills and vocabulary and to provide a transition to the study of more difficult texts.

102A-102B. Readings in Classical Persian Prose. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101A-101B or equivalent. Systematic study of representative selections from all periods of classical Persian literature, with attention to the historical and intellectual context.

104B. Contemporary Persian Literature. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101A-101B or consent of instructor. This course will deal with significant works of Persian prose and poetry from the beginning of the nineteenth 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 nineteenth century and the period of the Constitutional Revolution (1905-1911).

B. The literature of the rest of the twentieth century.

106A-106B. Reading and Composition for Students with Knowledge of Spoken Persian. (3,3) Three hours of lecture per week. Prerequisites: Knowledge of spoken Persian and consent of instructor. Designed to promote advanced literary skills in students with different levels of spoken Persian. Little or no reading and writing skills in the language. This course will prepare students to take advanced literature courses in the Persian program. (F,SP)

198. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Must be taken on a pass/fail basis. Enrollment is restricted by regulations shown in the General Catalog.

Graduate Courses

200A-200B. Advanced Persian. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Twelve units of upper division work. Different sections offering a variety of texts from all periods of the literature.

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 readings in the classics of Persian
Semantics

Upper Division Courses

100B. Aramaic. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Hebrew 100A-100B; Biblical and Ancient Aramaic, including study of the Aramaic parts of Daniel and Ezra and the inscriptions and papyri from Syria, Egypt, Mesopotamia, and the Persian Empire. Sequence begins Fall.

Graduate Courses

200A-200B. Studies in Comparative Semitics. (3-3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Twelve upper division units in Semitics or consent of instructor; 200A is prerequisite to 200B. Comparative Semitic phonetics, morphology, and lexicography within the wider context of Afro-Asiatic linguistics. Late in the course, concentration on the evolution of one particular Semitic language. Sequence begins Fall.

205A-205B. Ugaritic. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101A-101B or 100A-100B or equivalent. Ugarit language and literature with stress on comparative morphology and lexicography. Sequence begins Fall.

298. Seminar. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. Special topics in Semitics. Topics vary and are announced at the beginning of each semester.

Turkish

Lower Division Courses

1A-1B. Elementary Modern Turkish. (5-5) Five hours of lecture per week. Sequence begins Fall.

Upper Division Courses

100A-100B. Intermediate Modern Turkish. (5-5) Five hours of lecture per week. Prerequisites: 1A-1B or equivalent. Sequence begins 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 consent of instructor. Selected topics from modern Turkish literary works.

102A-102B. Ottoman Turkish Texts. (3-3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 20B or consent of instructor. Study of Turkish literary and historical texts in Arabic script, from the 13th to the 20th century.

104. Law and Society in the Early Modern Middle East: Sources in Ottoman Turkish. (1) One hour of discussion per week. Prerequisites: Consent of instructor. This course is to be taken concurrently with Near Eastern Studies 174 by those students who wish to supplement the readings assigned for 174 with additional readings of primary sources in the original Ottoman Turkish.

Graduate Courses

200A-200B. Advanced Turkish. (3-3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Twelve upper division units in Turkish. Different sections offering a variety of texts from all periods of the literature.

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: 349 Mulford Hall, (510) 642-8815
Director: Corey Goodman, Ph.D.

Professors

David R. Bentley, Ph.D. University of Michigan (Molecular and Cell Biology)
S. Marc Breedlove, Ph.D. University of California, Los Angeles (Psychology)
Mark D’Esposito, M.D. State University of New York Health Science Center at Syracuse, College of Medicine (Psychology)
Russell De Vosio, Ph.D. University of Michigan (Psychology)
Michael Dickens, Ph.D. University of Washington (Integrative Biology)
Ralph S. Freeman, O.D. Ohio State University, Ph.D. University of California, Berkeley (Optometry)
Cory S. Goodman, Ph.D. University of California, Berkeley (Molecular and Cell Biology)
Richard Ivy, Ph.D. University of Oregon (Psychology)
Robert T. Knight, Ph.D. Northwestern University Medical School (Psychology)
Harold Lecar, Ph.D. Columbia University (Molecular and Cell Biology)
Sheilah M. Miller, Ph.D. University of Michigan (Optometry)
W. Geoffrey Owen, Ph.D. Imperial College, London (Molecular and Cell Biology)
Mu-ming Poo, Ph.D. Johns Hopkins University (Molecular and Cell Biology)
Arthur P. Shimamura, Ph.D. University of Washington (Psychology)
Richard A. Steinhardt, Ph.D. Columbia University (Molecular and Cell Biology)
Mark A. Tanouye, Ph.D. Yale University (Environmental Science, Policy, and Management)
Richard A. Van Sluyters, O.D., Ph.D. Indiana University (Optometry)
David A. Weisblat, Ph.D. California Institute of Technology (Molecular and Cell Biology)
Frank S. Werblin, Ph.D. Johns Hopkins University (Molecular and Cell Biology)
Jeffery A. Winer, Ph.D. University of Tennessee (Molecular and Cell Biology)
Irvung Zucker, Ph.D. University of Chicago (Psychology)
Robert S. Zucker, Ph.D. Stanford University (Molecular and Cell Biology)

Associate Professors

John Flannery, Ph.D. University of California, Santa Barbara (Optometry)
Gian Gangi, Ph.D. St. Louis University (Molecular and Cell Biology)
Ehud Isacoff, Ph.D. McGill University (Molecular and Cell Biology)
Lucía Jacob, Ph.D. Princeton University (Psychology)
Joshua Kaplan, Ph.D. University of California, San Francisco (Molecular and Cell Biology)
John Ngal, Ph.D. California Institute of Technology (Molecular and Cell Biology)

Assistant Professors

Yang Dan, Ph.D. California University (Molecular and Cell Biology)
Jack Gallo, Ph.D. Yale University (Psychology)
Richard Kramer, Ph.D. University of California, Berkeley (Molecular and Cell Biology)
David Schaffer, Ph.D. Massachusetts Institute of Technology (Chemical Engineering)
Noam Sobel, Ph.D. Stanford University

Graduate Program

The Neuroscience Graduate Program is an integrated interdisciplinary graduate program offering study and research in neuroscience. The program includes, in addition to faculty from the Helen Wills Neuroscience Institute, approximately 40 faculty members in the Departments of Molecular and Cell Biology; Psychology; Integrative Biology; Chemical Engineering; Physics; Environmental Science, Policy, and Management; and in the School of Optometry/Program in Vision Science. 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; 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 mammalian cerebral cortex, and human brain imaging.

Faculty in the Neuroscience Institute are involved in five broad research areas: molecular neuroscience, cellular neuroscience, developmental neuroscience, systems neuroscience, and cognitive neuroscience. 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. Applicants are required to submit GRE General Test scores as well as one GRE Subject Test score (in biochemistry and cell biology, chemistry, psychology, biology, computer science, or physics).

Graduate students are required to take only a core curriculum of graduate courses during their first two years, and they are free to choose among a wide range of specialized graduate courses. To ensure breadth in didactic course work, 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 neuroscience; and cognitive neuroscience). Note that 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.

Graduate students advance to candidacy for the Ph.D. by passing a qualifying examination. They are also required to serve as graduate student instructors for at least two semesters during their first three years of study. Graduate advisers help students tailor their course work to their individual needs and interests.

For detailed information on the graduate program, see http://neuroscience.berkeley.edu, or e-mail neurosci@ucdink.berkeley.edu, or mail your inquiries to Graduate Student Affairs, Neuroscience Institute, 349 Mulford Hall #3190, University of California, Berkeley, CA 94720-3190.

The Neuroscience Institute has no designated courses, but the various affiliated departments offer a wide range of neuroscience graduate courses. A selection is listed below. (For more details, see individual course descriptions.)

**General/Survey Courses:** Advanced Principles of Neuroscience (MCB 260), and Ethics in Scientific Research (MCB 293C).

**Cellular, Molecular, and Developmental Neurobiology Courses:** Advanced Cellular Neurobiology (MCB 261), Cell and Molecular Biology of Ocular Disease (Vision Science 212B), and Advanced Developmental Neurobiology (MCB 263).

**Systems Neuroscience Courses:** Advanced Topics in Systems Neuroscience (MCB 262), Survey of Vision (Vision Science 212F), Color Vision (Vision Science 216), and Spatial Vision (Vision Science 218).

**Cognitive/Behavioral Neuroscience Courses:** Cognitive Neuroscience (Psychology 210A), Pros- semin on Animal Behavior (Psychology 216B), Prosemin on Cognition (Psychology 220A), Pros- semin on Consciousness (Psychology 220B), Prosemin on Human Memory (Psychology 220C), and Prosmin on Perception (Psychology 220E).

Other selected seminar courses include Graduate Seminar on Specialized Neuroscience Topics (MCB 290), Issues in Cognitive Neuroscience (Psychology 218), and Graduate Seminar on Specialized Topics in Biological and Cognitive Psych- ology (Psychology 290).

The Helen Wills Neuroscience Institute also sponsors an annual campuswide Neuroscience retreat, a weekly seminar series, and a Neuroscience Jour- nal Club.

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**Nuclear Engineering**

(College of Engineering)

Department Office: 4153 Etcheverry Hall, (510) 642-5010
http://neutrin.nuc.berkeley.edu/
Chair: Per F. Peterson, Ph.D.

**Professors**


*T. Kenneth Fowler, Ph.D. University of Wisconsin at Madison. Applied plasma physics and fusion.*

William E. Kaiser, Jr., Ph.D. (Daniel M. Tellep Distinguished Professor), Ph.D. University of California, Berkeley. Nuclear reactor safety, risk assessment, and risk management.


Per F. Peterson (Chair), Ph.D. University of California, Berkeley. Thermal hydraulics and nuclear materials management.


*Vingli E. Schnick, M.S., Ph.D. University of California, Berkeley. Reactor thermal hydraulics, safety.*

Lawrence M. Grossman, Ph.D. (Emeritus)

Seilg N. Kaplan, Ph.D. (Emeritus)

Lawrence Ruby, Ph.D. (Emeritus)

**Associate Professors**


Daniel M. Kammern, Ph.D. Harvard University. Renewable energy systems and environmental impacts of energy generation and use.


**Department Overview**

Nuclear engineering is concerned with the applications of nuclear reactions and radiation to biomedical, energy, systems, and environmental concerns and issues. The scope of the field includes the design, analysis, and operation nuclear reactors and their nuclear fuel cycles, de- vices for the treatment of cancer, and treatment of disease, and systems for the treatment and disposal of high-level radioactive waste. The principles 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 inter- action of nuclear radiation with matter, the be- havior of neutrons in reactor media, the thermal and hydrodynamic principles of heat extraction, the properties of nuclear materials, and operations and processes in nuclear fuel cycles, reactor design, and thermonuclear fusion. These subjects are taught in courses at the undergraduate and gradu- ate levels. Other courses include radiation pro- tection, environmental effects, nuclear safety, risk analysis, high-level radioactive waste disposal, medical imaging, biophysics, and biomedical de- vices.

Undergraduates can major in general nuclear en- gineering, bionuclear engineering, radioactiv- e waste management, or the nuclear engineering double major programs. Students can major in the double major programs beginning in their junior year. The double major programs are jointly offered through nuclear engineering and the following fields of engineering: mechanical, electrical, or materials science. The department also supports the bioenergetics by offering courses in bionuclear engineering and radiological physics. Graduate programs leading to the master’s and doctoral degrees involve advanced course work in nuclear engineering and in allied fields and direct participation in research under supervision of the nuclear engineering faculty.

The B.S. program is accredited in nuclear engi- neering by the Engineering Accreditation Com- mission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012. (410) 347-7700.

**Curriculum for the Bachelor’s Degree**

**General Nuclear Engineering Program:** A total of 120 units is required, including:

**Lower Division.** Required: Mathematics 1A-1B, 53, 54; Chemistry 1A-1B; Physics 7A-7B-7C; En- gineering 37, 77. 45: Electrical Engineering and Com- puter Science 100, Electronics Techniques for En- gineering (may also be satisfied by EECS 40); electives.

**Upper Division.** Required: Engineering 115, 117; Nuclear Engineering 101, 104A-104B, 120, 150, 155, 161, 170; Mechanical Engineering 106 and 109; electives.

**Note:** Electives must include (a) units to meet the humanities and social studies requirement, and (b) at least 6 units of upper division NE courses.

**Bionuclear Engineering Program:** A total of 120 units is required, including:

**Lower Division.** Required: Mathematics 1A-1B, 53, 54; Chemistry 1A, Chemistry 3A; Physics 7A- 7B-7C; Engineering 45, Biology 1A. Electrical En- gineering and Computer Sciences 100, Electronics Techniques for Engineering (also may be satisfied by EECS 40); electives.

**Upper Division.** Required: Engineering 115, 117; Nuclear Engineering 101, 104A, 107, 150, 155, 162, 167; Advances Biology Core (two courses); electives.

**Note:** electives must include (a) units to meet the humanities and social studies requirement, and (b) at least 6 units of upper division NE courses.

**Radioactive Waste Management Program:** A to- tal of 120 units is required, including:

**Lower Division.** Required: Mathematics 1A-1B, 53, 54; Chemistry 1A-1B; Physics 7A-7B-7C; En- gineering 45, 77. Electrical Engineering and Com- puter Science 100, Electronics Techniques for En- gineering (also may be satisfied by EECS 40); ESPM 2; electives.

**Upper Division.** Required: Engineering 115, 117; Nuclear Engineering 101, 104A-104B, 120, 124, 150, 155, 162, 170; Materials Science 176; Energy and Resources Group 102; Nuclear Engineering 175 or Civil Engineering 193; electives.

**Note:** Electives must include (a) units to meet the humanities and social studies requirement, and (b) at least 6 units of upper division NE courses.

**Humanities and Social Studies Requirement.** Six courses at of least 3 units each in humanities and social studies selected from an approved list of courses will be required of single major students and five such courses will be required of double major students. Of these, at least one course must be an English composition course taken from the current approved college list of courses (List E), one must be from a list of selected courses in Western History and Cultures, one must be from a list of selected courses in Western Literature and Values, and two must be upper division courses. The English composition course and either the course in History and Cultures or that in Literature and Values must be taken for a letter grade. A minimum of two courses, at least one of which is in the upper division, must be taken from a single de- partment.

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**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**

*Professor of the Graduate School*

*Recipient of Distinguished Teaching Award*
Note: In addition to the courses listed under the Department of Nuclear Engineering, the department offers the following course found in the Engineering section of this catalog: 115, Engineering Thermodynamics.

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, undergraduate course work 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, letters of recommendation, and the GRE and TOEFL (if applicable). There are eight graduate program areas, each representing an important aspect of nuclear technology: Applied Nuclear Reactions and Instrumentation, Bionuclear and Radiological Physics, Chemistry, Engineering, Nuclear Technology, Fission Reactor Analysis, Fission Reactor Engineering, Fusion Reactor Analysis and Engineering, Radioactive Waste and Materials Management, and Risk Analysis. Course work and research opportunities are available in each area.

A program of study is selected for each individual student. The program is chosen so that qualified students may make maximum progress in preparation for the doctoral examinations while gaining valuable experience in engineering research for both the master’s (M.S. or M.Eng.) and doctoral (Ph.D. or D.Eng.) programs. Further information may be obtained from the Department of Nuclear Engineering Graduate Office, 4149 Etcheverry Hall.

Lower Division Courses

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. The Berkeley Seminar Program has been designed to provide new entering students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered at all campus departments, and topics vary from department to department and semester to semester. (F,SP)

39. Issues in Nuclear Science and Technology. (2) Two hours of lecture per week. Introduction to technical, social, institutional, and ethical issues in nuclear engineering; nuclear reactions and radiation, radiation protection and control, nuclear energy production and utilization, nuclear fuel cycle, reactor safety, controlled fusion, nuclear waste, medical, and other applications of radiation, nuclear nonproliferation and arms control and engineering ethics. (SP, Fall)

Upper Division Courses

101. Nuclear Reactions and Radiation. (4) Four hours of lecture per week. Prerequisites: Physics 7C. Energetics and kinematics of nuclear reactions and radioactive decay, fission, fusion, and reactions of the energy neutrons; properties of the fission products and the actinides; nuclear models and transition probabilities; interaction of radiation with matter. (F, Prussin)

104A. Radiation Detection and Nuclear Instrumentation Laboratory. (2,4) One hour of lecture and four hours of laboratory per week; for 4 units, two additional hours of lecture per week. Prerequisites: 101 or equivalent or consent of instructor; 150 recommended. Basic science of radiation measurement, nuclear instrumentation, neutronics, radiation dosimetry. The extended course material will include additional lectures on applications to nuclear and non-nuclear research, medicine, environment and science and technology, and a variety of other technologies, plus a more intensive discussion of radiation detection. (F, Lederer, Lim, Vujic)

104B. Nuclear Engineering Laboratory. (2) One hour of lecture and four hours of laboratory per week. Prerequisites: 120 and 180 recommended; 104A not required. Nuclear temperature; thermal-hydraulics and two-phase flow; diagnosis of fusion plasmas and fusion neutrons. (SP, Morse)

107. Introduction to Imaging. (3) Three hours of lecture per week. Prerequisites: 101 and 104A or consent of instructor. Introduction to medical imaging, imaging physics, and systems, including x-ray computed tomography (CT), magnetic resonance (MRI), positron emission tomography (PET), and SPECT; basic principles of tomographic and conformal imaging methods; resolution effects of counting statistics, inherent system resolution and human factors. (SP, Prussin, Vujic)

120. Nuclear Materials. (3) Three hours of lecture per week. Prerequisites: Engineering 45 and an upper division course in thermodynamics. Effects of irradiation on the atomic and mechanical properties of materials in nuclear reactors. Fission product swelling and re-lease; neutron damage to structural alloys; fabrication and properties of uranium; fuels. (SP, Dillander)

124. Radioactive Waste Management. (3) Three hours of lecture per week. Prerequisites: Engineering 117 or equivalent course. Components and material flowsheets for nuclear fuel cycle, waste characteristics, source terms, and waste forms; radionuclides in nuclear reactors. (SP, Ahn)

135. Nuclear Facility Operations. (3) Three hours of lecture per week and a one-week field trip after third or fourth semester. Offered as part of consent of instructor. Honors program on the operation of nuclear facilities. Operation of nuclear fission power plants and other nuclear facilities. Use of control room simulators. Loss of coolant accidents, severe accidents, Quality assurance and documentation. Power plant equipment and maintenance. (F,SP, Vujic)

150. Introduction to Nuclear Reactor Theory. (3) Three hours of lecture per week. Prerequisites: 101; Mathematics 53 and 54. Neutron interactions, nuclear fission, and chain reacting systems in thermal and fast nuclear reactors. Diffusion and slowing down of neutrons. Criticality calculations, Nuclear reactor dynamics and reactivity feedback. Production of radionuclides in nuclear reactors. (SP, Greenspan, Vujic)


161. Nuclear Power Engineering. (3) Three hours of lecture per week. Prerequisites: Course(s) in fluid mechanics and heat transfer; junior-level course in thermodynamics. Introduction to energy production by controlled thermonuclear reactions. Nuclear fission reactions, energy balances for fusion systems, survey of plasma physics; neutron beam injection; RF heating methods; vacuum systems; tritium handling. (F, Morse)

199. Supervised Independent Study. (1-4) Course may be repeated for credit 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 restrictions apply; see the Introduction to Courses and Curricula section of this catalog. (F,SP)

Graduate Courses

201. Nuclear Reactions and Interactions of Radiation with Matter. (4) Four hours of lecture per week. Prerequisites: 101. Interaction of gamma rays, neutrons, and charged particles with matter; nuclear structure and radioactive decay; cross sections and energetics of nuclear reactions; nuclear fission and the fission products; fission and fusion reactions as energy sources. Offered even-numbered years. (SP, Prussin)

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 in metals. Void swelling and irradiation creep. Mechanical analysis of structures under irradiation. Sputtering, blistering, and hydrogen behavior in fusion reactor materials. Offered odd-numbered years. (SP, Olander)

221. Corrosion in Nuclear Power Systems. (3) Three hours of lecture per week. Prerequisites: 120, Materials Science and Mineral Engineering 112 recommended. Structural metals in nuclear power plants; properties and fabrication of Zircaloy; aqueous corrosion of reactor components; structural integrity of reactor components under combined mechanical loading, neutron irradiation, and chemical environment. Offered even-numbered years. (SP, Olander)

224. Safety Assessment for Geological Disposal of Radioactive Wastes. (3) Three hours of lecture per week. Prerequisites: 124 or upper division course in differential equations. Multi-barrier concept; groundwater hydrology, mathematical modeling of mass transport in heterogeneous media, source term for fast...
field model; near-field chemical environment, radionuclide transport in the near field, effect of temperature on repository performance, effect of water flow, effect of geochemical conditions, effect of engineered barriers on performance, overall performance assessment, performance index, uncertainty associated with assessment, regulation and standards. (SP) AHN

250. Nuclear Reactor Theory. (4) Four hours of lecture per week. Prerequisites: 150. Computational methods used to analyze nuclear reactor systems described by various differential, integral, and integro-differential equations. Numerical methods include finite difference, finite elements, discrete ordinates, and Monte Carlo. Examples from neutron and photon transport, heat transfer, and thermal hydraulics. An overview of optimization techniques for solving the discrete-ordinate equations on vector and parallel computer systems. (F) Vujic

260. Thermal Aspects of Nuclear Reactors. (4) Four hours of lecture per week. Prerequisites: Mechanical Engineering 106 and 109 or Chemical Engineering 150B. Fluid dynamics and heat transfer; thermal and hydraulic analysis of nuclear reactors; two-phase and compressible flow; compressible flow; stress analysis; energy conversion methods. Offered even-numbered years. (F) Peterson

265. Design Analysis of Nuclear Reactors. (3) Three hours of lecture per week. Prerequisites: 150 and 161. Principles and methods used in the safety evaluation of nuclear power plants. Flow philosophies, design criteria and regulations. Deterministic and probabilistic models, reliability analysis, nuclear and thermal-hydraulic transients, radiological consequences, and risk assessment. Infiltration-basis and severe accident analysis, role of engineered safety systems, siting, and licensing. Case studies of accidents. Offered odd-numbered years. (SP) Kastenberg

275. Principles and Methods of Risk Analysis. (4) Four hours of lecture per week. Prerequisites: Consent of instructor. Civil Engineering 193 and Industrial Engineering 166 recommended. Principles and methodological approaches for the quantification of technological risk and risk-based decision making. Offered odd-numbered years. (F) Kastenberg

280. Fusion Reactor Engineering. (3) Three hours of lecture per week. Prerequisite: 120 and 166. Conception and design of fusion systems. Introduction to controlled thermonuclear fusion as an energy economy, from the standpoint of the physics and technology involved. Case studies of fusion reactor design. Engineering principles of support technology for fusion systems. Offered even-numbered years. (SP) Morse


290A. Ion Source and Beam Technology. (2) Two hours of lecture per week. Prerequisites: Graduate standing, 180, or equivalent. Topics in this course will include the latest technology of both positive and negative ion sources, extraction and formation of ion sources, computer simulation of beam propagation, diagnostics of ion source plasmas and beams, and the integration of ion sources into post-acceleration systems. Ion source characteristics and beam diagnostics will be demonstrated experimentally. Offered even-numbered years. (F) Leung, Morse

290B. Subsurface Nuclear Technology. (3) Three hours of lecture per week. Prerequisites: 155, 162 and graduate standing. This course will cover the fundamentals of subsurface nuclear technology and its applications to 1) infer the porosity, the density, elemental composition, and fluid saturation of subsurface media; 2) identify fluid movement in reservoirs; 3) determine fluid characteristics in complex fluid regimes; and 4) perform borehole diagnostics, using neutron and photo measurement and simulation techniques. Application of computational methods will also be covered. (F.S.P) Badrizzaman, Vujic

295. Nuclear Engineering Colloquium. One and one-half hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Presentations on current topics of interest in nuclear technology by experts from government and universities. Open to the campus community. (F.S.P) Peterson

298. Group Research Seminars. (1) Course may be repeated for credit. One and one-half hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Seminars in current research topics in nuclear engineering and its applications: Section 1 - Fusion; Section 2 - Nuclear Waste Management; Section 3 - Nuclear Thermal Hydraulics; Section 4 - Nuclear Chemistry; Section 6 - Nuclear Materials; Section 7 - Fusion reaction design; Section 8 - Nuclear Instrumentation. (F.S.P) Staff

299. Individual Research. (1-12) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Investigation of advanced nuclear engineering problems. (F.S.P) 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: For candidates for doctoral degree. 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.S.P) Staff

Nutrition
(College of Natural Resources, Interdepartmental Graduate Groups)
Office: 127 Morgan Hall, (510) 642-2879
Chair: Leonard Bjeldanes, Ph.D.

Professors
Bruce N. Ames, Ph.D. (Molecular and Cell Biology)
Leonard F. Bjeldanes, Ph.D. (Chemical Sciences)
Gladys Block, Ph.D. (Epidemiology)
John E. Casida, Ph.D. (Environmental Science, Policy, and Management)
Benito O. deLumen, M.D. (Nutritional Sciences)
Sharon E. Fleming, Ph.D. (Nutritional Sciences)
John G. Forte, Ph.D. (Molecular and Cell Biology)
Marc Hultenstern, M.D. (Nutritional Sciences)
Isako Kubo, Ph.D. (Environmental Science, Policy, and Management)
Joseph L. Nagle, M.D. (Medicinal Chemistry)
Lester Paxson, Ph.D. (Molecular and Cell Biology)
Z. I. Sabry, Ph.D. (Chemical Sciences)
George Sensabaugh, D. Crm. (Public Health)
Barry Shaner, Ph.D. (Nutritional Sciences)
Martin Smith, M.D. (Nutritional Sciences)
Hei Sook Sul, Ph.D. (Nutritional Sciences)
Fernando Viteri, M.D., D.Sc. (Nutritional Sciences)
Doris Howes Calloway, Ph.D. (Nutritional Sciences)
Kenneth J. Carpenter, Ph.D. (Emeritus) (Nutritional Sciences)
Janet C. King, Ph.D. (Emeritus) (Nutritional Sciences)

Research Assistant Professors
Kathleen A. Oake, M.D. (Nutritional Sciences)
Paola Timiras, Ph.D. (Emeritus) (Molecular and Cell Biology)
Mary Ann Williams, Ph.D. (Emeritus) (Nutritional Sciences)

Instructors
Barbara Abrams, Dr. P.H. (Public Health)
Nancy K. Amy, Ph.D. (Nutritional Sciences)
Gregory W. Aponite, Ph.D. (Emeritus) (Nutritional Sciences)
George W. Chang, Ph.D. (Nutritional Sciences)
Susan M. Oace, Ph.D. (Nutritional Sciences)

Adjunct Professors
Ronald M. Krauss, M.D. (Biochemistry)
Diane L. Treible, Ph.D. (Nutritional Sciences)

Program Overview
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 to organisms and from laboratory animals to humans. The program has special strengths in cellular and molecular nutrition and in human nutrition and metabolism. Graduate research is often conducted in collaboration with biomedical scientists from other departments at Berkeley including the Departments of Molecular and Cell Biology, Integrative Biology, and Plant and Microbial Biology, and from the Lawrence Berkeley National Laboratory. For admission to the M.S. or Ph.D. programs, students should have a bachelor’s degree or its equivalent in nutritional sciences or related fields, including biochemistry and molecular biology, chemistry, 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 instructor. Students seeking further information concerning matters such as curricula, admission, and financial support should contact the student affairs officer in the Department of Nutritional Sciences and Toxicology.

Nutritional Sciences and Toxicology
(College of Natural Resources)
Department Office: 119 Morgan Hall, (510) 642-6490
Chair: Leonard Bjeldanes, Ph.D.

Professors
Leonard F. Bjeldanes, Ph.D. University of California at Los Angeles. Food toxicology, chemical carcinogenesis.
John E. Casida, Ph.D. University of Wisconsin-Madison. Insecticide resistance. (Emeritus) (Molecular and Cell Biology)
Benito O. deLumen, Ph.D. University of Cambridge at Davis. Food chemistry, molecular biology of ligands as food source (Emeritus) (Nutritional Sciences)
Sharon E. Fleming, Ph.D. University of Saskatchewan. Food chemistry, gastrointestinal function (Emeritus) (Nutritional Sciences) (Emeritus) (Molecular and Cell Biology)
Marc Hultenstern, M.D. Ph.D. Massachusetts Institute of Technology. Hepatic metabolic regulation, nutrition and inflammation. (Emeritus) (Nutritional Sciences)
Isako Kubo, Ph.D. Osaka City University. Japan. Natural products (Emeritus) (Nutritional Sciences)
Joseph L. Nagle, Ph.D. University of Michigan. Endocrinology of retinoid metabolism (Emeritus) (Nutritional Sciences)
Barry Shaner, Ph.D. University of London. Regulation of vitamin metabolism.
Hei Sook Sul, Ph.D. University of Wisconsin-Madison. Lipid metabolism, adipose cell differentiation
Fernando Viteri, M.D., D.Sc. University of Cincinnati. Social and behavioral aspects of preventive nutrition (Emeritus) (Nutritional Sciences)
Doris Howes Calloway, Ph.D. (Emeritus) (Nutritional Sciences)
Kenneth J. Carpenter, Ph.D. (Emeritus) (Nutritional Sciences)
Mary Ann Williams, Ph.D. (Emeritus) (Nutritional Sciences)
Associate Professors
Nancy K. Amy, Ph.D., University of Virginia. Regulation of trace element metabolism
Gregory W. Allemand, Ph.D., University of California at Davis. Gastrointestinal peptides and nutrient assimilation
George W. Alpers, Ph.D., University of California, Berkeley. Nutrition and resistance to infection
Suzan M. Oace, Ph.D., University of California, Berkeley. Nutrient bioavailability, vitamin metabolism

Assistant Professors
Sean M. Baker, Ph.D., University of Liverpool, England. DNA methylation, cancer, fertility
Jean-Marc Schwarz, Ph.D., University of Lausanne, Switzerland. Protein metabolism
Christopher Vulpe, Ph.D., University of California, San Francisco. Genetic approaches to study of mammalian copper and iron metabolism

Adjunct Professors
Ronald M. Krauss, M.D., Harvard Medical School. Genetic and nutritional regulation of protein metabolism
Diane L. Tribble, Ph.D., Emory University School of Medicine. George Wolt, Ph.D., Oxford University. The influence of Vitamin A on carcinogenesis

Lecturers
Mark Hudes, Ph.D.
Nancy Hudson, M.S., R.D.
Joanne Reda, M.A., R.D.
Mary Mead, M.Ed., R.D.

Director, Clinical Dietetics Program
Nancy Hudson, M.S., R.D.

Education Goals and Major Requirements
The Department of Nutritional Sciences and Toxicology offers one undergraduate major leading to the B.S. degree. Courses that fulfill the lower division prerequisites for junior standing include Biology 1A, Chemistry 1A, 3A-3B, 5; English 1A-1B or equivalent: Mathematics 16A; Molecular and Cell Biology 32, 32L; Nutritional Sciences 10; Physics 8A; and Statistics 2 or 20. There are three tracks within the nutritional sciences degree:

Track I, Physiology and Metabolism
Track I combines a strong foundation in the biological sciences with advanced course work in nutrition, biochemical and physiological study of nutrient utilization; and food science, the properties and processing of food materials. Graduates often pursue further study in the biological sciences, enter professional programs in health sciences, or seek employment in research laboratories, government agencies, or in the food industry.

Track II, Dietetics
Track II is currently approved as a Didactic Program in Dietetics by the Commission for Accreditation for Dietetics Education of the American Dietetic Association, 216 W. Jackson Blvd., Chicago, IL 60606-6995, (312) 899-4876. At the junior and senior levels students take course work emphasizing nutrition and the application of this knowledge through dietetic practice. Graduates of a didactic program in dietetics are eligible to apply to supervised programs (such as dietetic internships) during which students will receive practical training. Upon satisfactory completion of both the academic course work and the postbaccalaureate supervised practice program, students are eligible to take the nationally administered registration examination for credentialing as a registered dietitian. Registered dietitians are engaged in health care, government, industry, community agencies, educational institutions, and research laboratories. Many graduates pursue further professional or graduate study in nutrition, biochemistry, or related fields. Additional courses which fulfill the lower division prerequisites for junior standing in nutrition and clinical dietetics include Economics 1; Psychology 2, Sociology 3, or Anthropology 3.

Track III, Toxicology
Track III provides students with a strong background in the biological and chemical sciences with advanced course work focusing on nutrition and toxicology, the biochemical and physiological study of the adverse effects of nutrients and non-nutrients in the diet. Graduates are qualified for employment in the biological sciences in academic, governmental, and industrial laboratories and may pursue entry into a variety of advanced degree programs including medicine, dentistry, optometry, and pharmacology, as well as in basic research.

Minors
Students who have pursued basic course work in biological sciences under other majors may be eligible for one of the two undergraduate minors offered by the Department of Nutritional Sciences. Both minors require a minimum GPA of 2.5 and the completion of 15 units. The minor in nutritional sciences requires Nutritional Sciences 10, 103, 106, 160, and 3 additional elective units of upper division course work in the department. The minor in nutritional toxicology requires Nutritional Sciences 120; Environmental Science, Policy, and Management 148; Public Health 172. All courses must be taken on the Berkeley campus for a letter grade. No course substitutions are allowed. Interested students should obtain the requirements from the department before starting the minor. Students will be awarded the minor upon successful completion of coursework from the department.

Graduate Courses
The graduate courses offered by the department are designed primarily to support the Ph.D. and M.S. degree programs in nutrition. Courses include advanced study of human nutrition and metabolic regulation at the cellular and organismal levels. Graduates find employment in academic institutions, medical research, clinical nutrition, research and extension agencies, government, and industry. Many seek advanced professional and medical degrees.

Major degree requirements appear in the Announcement of the College of Natural Resources.

Honors Program
Students who are interested in the honors program in nutritional sciences should apply no later than the beginning of their senior year. A grade-point average of 3.3 or higher is required both overall and in the major course work. Students enroll for a minimum of two semesters in NS 119 & Honors Research in Nutritional Sciences, for a total of at least 8 semester units. Attendance in a graduate seminar is highly recommended. In order to graduate with honors, students must write a superior thesis based on their research to be reviewed by a committee of three faculty members.

For further information, please contact the student affairs officer, 127 Morgan Hall, (510) 642-2879.

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. 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. The emphasis of the course is on issues of current interest and on the worldwide problems of food and nutrition. 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

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 are graded on a pass/no pass basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectually challenging 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. Priority given to freshmans and sophomores. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/no pass basis. Freshman seminars offer lower division students the opportunity to explore an intellectually rich topic with a faculty member and a group of peers in a small seminar setting. These seminars are offered in all upper-division departments; topics vary from department to department and from semester to semester. (F,SP) Staff

98. Directed Group Study. (1-3) Course may be repeated for credit. One hour of lecture per week. Must be taken on a pass/no pass basis. Prerequisites: Lower division major or consent of instructor. Study of special topics in nutritional sciences 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 to nine hours of laboratory per week. Must be taken on a pass/no pass basis. 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 the General Catalog. (F,SP)

Upper Division Courses
103. Nutrition 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. 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) Staff

104. Human Food Practices. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: 10, 20, and 60. History, geo-ecological, biological, cultural, social, political, and personal determinants of human diets. Community food and nutrition problems and programs. Food safety and consumer protection. Contributes to the pursuit of multidisciplinary degrees in nutrition policy and planning. (SP) Viteri

106. Introduction to Food Science. (3) Three hours of lecture per week. Prerequisites: Molecular and Cell Biology 102 or consent of instructor. Evaluation of the chemical, physical, functional, and nutritional properties of foods and the changes which occur during preparation, processing and storage. Evaluation of the quality criteria of foods and the criteria for standards and legal requirements. (F) Staff

107. Introductory Food Science Laboratory. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 106. Formerly 106L. Experimental study of the principles and techniques of food preparation. Evaluation of the sensory and quality aspects of food. Principles of food procurement including purchasing, safe handling, and storage practices. (SP) de Lumen

110. Food Toxicology. (3) Three hours of lecture per week. Prerequisites: Molecular and Cell Biology 102 (may be taken concurrently). A comprehensive survey of the principles of modern toxicology and their application in evaluating the safety of foods and food contaminants. Mechanisms of metabolic activation, detoxification, and selective toxicity are emphasized. (SP) Bjeldanes

113. Food Microbiology. (2) Two hours of lecture per week. Prerequisites: Recommended: one course each in elementary biology and chemistry. Characteristics and actions of microorganisms involved in food and waterborne illness, food spoilage, and food fermentation and selected aspects of food microbiology. The statistics of quality control. (SP) Chang

120. Toxicology II. (4) Four hours of lecture per week. Prerequisites: 103 and 110 or consent of instructor. Advanced issues in modem day toxicology including molecular aspects of chemical carcinogenesis, genetic toxicology, toxic effects on the immune, re-
productive, and other organ systems. The course is also cross-listed as Public Health 271C. (SP) Smith

135. Food Systems Organization and Management. (4) Three hours of lecture and three hours of fieldwork per week. Prerequisites: Consent of instructor. Principles of organization and management applied to institutional food systems, management of resources, quality assurance, equipment, layout, marketing, personnel management, fiscal management. Laboratory experiences, projects and field work in institutional situations. (SP) Hudson

150. Experimental Nutrition. (3) Three hours of lecture per week. Prerequisites: Molecular and Cell Biology 102; 103 recommended. This course focuses on cellular and molecular regulatory mechanisms by which nutrients and experimental animal diets respond metabolically to changes in their nutritional environment, integration of these responses by the animal, and experimental evidence for these mechanisms and their integration. (SP) Sul, Napoli

C159. Human Diet. (3) Three hours of lecture per week plus two hours of voluntary discussion every other week. Since we eat every day, wouldn’t it be useful to learn more about human dietary practices? A broad overview of how interactions between humans and their foods. Topics include the human dietary niche, related biological variation to diet, diet and disease, domestication of staple crops, food processing techniques and development of regional culinary traditions. Modern diets and their problems. Food taboos, human attitudes toward foods, and dietary politics. Also listed as Environ Sci, Policy, and Management C159. (SP) Milton

160. Human Nutrition. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 103 or Molecular and Cell Biology 102. The biochemical and physiological basis for adjustments in human nutrient utilization during common nutritional problems is reviewed with an emphasis on an opportunity to apply their knowledge to case studies on obesity, starvation, anemia, osteoporosis, and other nutritional disorders. (SP) Schwarz

161. Medical Nutrition Therapy. (4) Four hours of lecture and one hour of discussion per week. Prerequisite: 160. The biochemical, physiological, and nutritional bases for the medical nutrition therapy of human conditions and diseases will be explored. Both enteral and parenteral routes for the delivery of nutrition will be considered. (F) Hellestein

161L. Medical Nutrition Therapy Laboratory. (2) Four hours of laboratory with demonstration per week. Prerequisites: 161 (may be taken concurrently). Theory and concepts from 161 are applied through a variety of methods such as nutritional assessments, care plan development, case studies. Students do calculations for therapeutic diets, enteral supplements and parenteral nutrition support. Product analysis and super market surveys are completed. (F) Mead

165. Human Nutrition Research. (1) One hour of lecture/discussion per week. Prerequisites: 160. The types and methods of human nutrition research will be covered, with focus on the role of the nutritionist as part of a research team. Related topics such as selection of subjects, selection of controls, laboratory assay systems, and sources of funding will be discussed. Assignments will include an evaluation of published research and design of a research diet. (SP) Staff

170. Experimental Nutrition Laboratory. (4) Students will receive no credit for 170 after taking 171. Six hours of laboratory, one hour of lecture, and one hour of discussion per week. Prerequisites: 103, 160, Chemistry 5, and a course in statistics. Basic principles and techniques of human and animal nutrition research. Students design, execute, and analyze experiments. (SP) Staff

171. Nutrition and Toxicology Laboratory. (4) Students 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: 103, 110, Molecular and Cell Biology 142 (may be taken concurrently), and a course in statistics. Basic principles and techniques used in human and animal nutrition and toxicology research. Students design, execute, and analyze experiments. (F) Baker

190. Introduction to Research in Nutritional Sciences. (4) One hour of lecture/discussion per week. Prerequisites: 103. Students will be asked to prepare an oral and written report on a topic selected from the current research literature in nutritional sciences. (F,SP) Staff

192. Dietetics Seminar. (1) One hour of lecture/discussion per week. Prerequisites: Upper division standing. This seminar explores the professional roles and responsibilities of dietitians as well as career opportunities within the field. Current issues in the practice of dietetics will be discussed. Students will conduct interviews, do library research, and present an oral report. (F) HUDSON

193. Introduction to Research in Toxicology. (1) One hour of seminar per week. Prerequisites: 110 or consent of instructor. Students will be asked to prepare an oral and written report on a topic selected from the current research literature in toxicology. (F,SP) Kubo

H196. Honors Research. (2-4) Course may be repeated for credit. A student may take between 2-4 units per semester but must complete a total of 6 units to qualify for Distinction. Three hours of work per week per unit. Prerequisites: Upper division standing; 3.3 GPA; consent of instructor; enrollment in department honors program. Individual laboratory research project; report due under the supervision of a staff committee. (F,SP)

197. Field Study in Food and Nutritional Sciences. (1-3) Course may be repeated for credit. Approximately three hours field study per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Enrollment in off-campus organizations relevant to specific aspects of foods and nutritional sciences. Regular individual meetings with faculty sponsor and written reports not required. (F) Staff

198. Directed Group Study. (1-3) Course may be repeated for credit. One hour of lecture/discussion per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Study of special topics in food science or nutrition that are not covered in depth in regular courses. (SP) Staff

199. Supervised Individual Study and Research. (1-3) Course may be repeated for credit. Approximately three hours laboratory per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Research restrictions apply: see the Introduction to Courses and Curriculum section of this catalog. (F,SP) Staff

Graduate Courses

200. Advanced Organ Systems and Nutrition and Metabolism. (3) Three hours of lecture/discussion per week. Prerequisites: 103, 160, and Molecular and Cell Biology 102 or equivalent. Critical analysis of concepts and research methods relating to nutritional and metabolic control of pathways in intact organisms is studied. Areas covered include the basis of nutrient requirements and nutritional assessment, integration of metabolic pathways, research techniques, nutritional diseases, and growth factors such as calcium, vitamin D, and trace elements. (F) Hellestein

210. Metabolic Regulation. (4) Four hours of lecture per week. Prerequisites: Consent of instructor. Principles of metabolic regulation in mammalian systems. Metabolic control enzymes and pathway fluxes in cells, tissues and the whole organism with emphasis on how metabolic control of pathways changes in response to nutritional status. Recent advances in methodologies for studying pathways ranging from molecular genetic to isotopic techniques. (F) Staff

2210. Dietary Determinants of Cancer, Heart Disease, and Aging. (3) Three hours of lecture per week. Prerequisites: Biochemistry and nutrition, or consent of instructor. The influence of diet on DNA damage, cancer, and aging will be discussed with an emphasis on micronutrient deficiencies as a major contributor to DNA damage, cancer, and aging. The influence of diet on atherosclerotic heart disease will be covered with an emphasis on the role of dietary constituents promoting or preventing these diseases in the artery wall. Readings will consist of papers from the literature. Also listed as Molecular and Cell Biology C210. (SP) Ames, Tribble

211A-211B. Introduction to Research in Nutritional Sciences. (4-8-4) One hour of discussion and four hours of laboratory per week per unit. Credit and grade may be awarded on completion of sequence. Prerequisites: Restricted to graduate students in the nutrition program; consent of instructor. Formerly 211. Closely supervised experiential work under the direction of individual faculty members; an introduction to experimental methods and research approaches in areas of nutritional sciences. (F,SP) Napoli

212. Statistics in Nutrition Research. (1) One hour of lecture per week. Prerequisites: A course in statistics. Selection and application of statistical procedures to experimental designs and data encountered in nutrition research. Assumptions and appropriateness of chi-square tests, T-tests, ANOVA, correlation and regression, multiple comparison procedures and nonparametric procedures will be examined. (SP) Hudes

290. Advanced Seminars in Nutritional Sciences. (1-2) Course may be repeated for credit. One to two hours of lecture/discussion per week. Prerequisites: Graduate standing. Advanced study of topics in nutrition research. 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 per unit. Must be taken on a satisfactory/unsatisfactory basis. 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. Presentation and discussion of current faculty research projects and experimental techniques in nutritional sciences. Intended primarily for first year graduate students. (F) 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. Special study in various fields of nutritional sciences. Topics chosen on the interests of qualified graduate students and availability of staff. (F,SP) Staff

299. Research in Food and Nutrition. (1-12) Course may be repeated for credit. Approximately four hours of research per week per unit. 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. Individual study in consultation with the major field advisor intended to provide an opportunity for qualified students to prepare for the various examinations required for candidates for the Ph.D. (F,SP) Staff

Professional Courses

301. Professional Preparation: Teaching in Nutritional Sciences. (1-2) Four hours of lecture per week per unit. Prerequisites: Consent of instructor. Creative approaches to teaching nutrition to diverse audiences are emphasized. Participants will identify their target population, learning 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.
Optometry
(School of Optometry)

Office of the Dean: 351 Minor Hall #2020, (510) 642-4414
Office of Admissions: 390 Minor Hall #2020, (510) 642-6407
http://spectacle.berkeley.edu

Dean: Dennis M. Levi, O.D., Ph.D.
Associate Dean for Academic Affairs: Gilliana Haegerstrom-Portney, O.D., Ph.D.
Associate Dean for Clinical Affairs: Edward J. Revelli, O.D.
Associate Dean for Student Affairs: Michael G. Harris, O.D., J.D., M.S.
Director of Residency Programs: Deborah Orel-Bixler, O.D., Ph.D.

Professors

Anthony J. Adams, O.D., Ph.D. Color vision; assessment of retinal function
Ian L. Bailey, O.D., M.S. Low vision; clinical optics; clinical assessment of visual performance
Martin S. Banks, Ph.D. Infant vision; visual development and spatial vision
Theodore E. Cohn, Ph.D. Psychophysics of vision; visual neurophysiology; low dose effects of ocular toxic agents
Kevin A. Davis, Ph.D. Psychophysics and electrophysiology of color vision and spatial vision
Russell L. DeValois, O.D. Visual neurophysiology; color vision; spatial vision
Ralph D. Freeman, O.D., Ph.D. Neurophysiology and psychophysics of visual development and plasticity
Gilliana Haegerstrom-Portney, O.D., Ph.D. Clinical psychophysics and basic aspects of human color vision; bivariate vision
Stanley A. Klein, Ph.D. Spatial vision; psychophysical methods and vision test design; nonlinear analysis of visual processes
Sheldon S. Miller, Ph.D. Retinal function, photoreceptors, retinal pigment epithelium, and retinal physiology
Kenneth A. Polse, O.D., M.S. Corneal physiology; contact lenses: ocular effects of topical medications
Clifton M. Schor, O.D., Ph.D. Binocular vision; human development, ocular motility, strabismus, and amblyopia
Richard G. Van Sluyters, O.D., Ph.D. Organization, development, and plasticity of mammalian visual pathways
Jay M. Enoch (Emeritus), O.D., Ph.D. Retinal receptor optics and function; quantitative layer-by-layer perimeter; visual acuity measurement and the elderly
Robert B. Mandell (Emeritus), O.D., Ph.D. Structure, growth, and physiology of the cornea; contact lenses
Elwin Marg (Emeritus), O.D., Ph.D. Visual neurophysiology; development and plasticity, visual-evoked potentials
Lawrence Starr (Emeritus), M.D. Control of eye movements, accommodation and the pupil; bioengineering of movement and computer vision

Associate Professors

John G. Flannery, Ph.D. Cell and molecular biology of the retina in normal and diseased states; neurobiology
Suzanne M. J. Flessig, O.D., Ph.D. Microbiology; immunology; infectious disease, cornel and tear physiology

Assistant Professor

Christine F. Wilsdorf, Ph.D. Myopia and eye growth regulation; animal models for mechanisms underlying emmetropization and myopia, etiology of human myopia and anisometropia, optical, biological, and pharmacological perspectives

Assistant Professors of Clinical Optometry

Robert B. D’Marto, O.D., M.S. Ocular disease and ocular therapeutics; pharmacology, electronic instructions; technology
Deborah A. Orel-Bixler, O.D., Ph.D. Assessment of visual abilities in infants, children and special needs population; visual evoked potentials; vision screening; and other vision tests and procedures
Wayne A. Verdon, O.D., Ph.D. Clinical and visual electrophysiology; inherited and acquired retinal diseases, and color vision

Senior Lecturers

J. David Grisham, O.D., M.S. Binocular vision anomalies; reading disabilities, vision of children
Michael G. Harris, O.D., J.D., M.S. Contact lenses and corneal physiology
Darrell B. Carter (Emeritus), O.D., Ph.D. Ocular pharmacology; clinical optometry; fixation disparity

Affiliated Professors

Richard J. Brand, Ph.D. Biostatistical methods for clinical research; Public Health
Summertime P. Davis, Ph.D. Astrophysical spectroscopy (Physics)
Maina C. Diamond, Ph.D. Neuroanatomy, environment, asynchrony, hormones (Integrative Biology)
Stephen P. D’Luzenko, Ph.D. Celestial mechanics, applied mathematics (Mathematics)
Richard A. Mathies, Ph.D. Biophysical and physical chemistry (Chemistry)
Herbert D. Simon, O.D., Ed.D. Reading acquisition, reading problems (Education)
Teresa P. Speed, Ph.D. Applied statistics (Statistics)

Eugene Sivkow, Ph.D. University of California at Santa Cruz, (Chemistry and Psychology)
Gerald B. Weatherwax (Emeritus), Ph.D. Neurobiology, psychophysics (Molecular and Cell Biology)

Associate Dean of Clinical Affairs

Edward J. Revelli, O.D., 230 Minor Hall, (510) 642-5045

Clinical Professors

Dennis S. Burger, O.D.
Robert P. Chiu, O.D.
Bernard J. Dolan, O.D., M.S.
Craig K. Higashi, O.D., M.P.H.
Donald R. Korb, O.D.
Edward J. Revelli, O.D.
Donald S. Saner, O.D.
A. Lee Scafe, O.D., M.S.
James E. Steedly, O.D., Ph.D.
Lawrence S. Tse, O.D., M.B.A.
Karen L. Walker-Brandt, O.D.
Leslie L. Walls, O.D., M.D.
Gerald Westheimer, O.D., Ph.D., F.R.S.

Associate Clinical Professors

Charles H. Bailey, O.D.
Frank K. Bixler, O.D., M.S.
Thomas M. Callan, O.D.
Robert E. DiMartino, O.D., J.D.
Waylin G. Eng, O.D.
Michael E. Fukai, O.D.
Patnaik, J. Janeta, O.D., M.P.H.
Curtis W. Keswick, O.D.
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George K. Lee, O.D.
Timothy Sanders, O.D.
Charlotte A. Tischac, O.D.
Diane H. Williams, O.D.
Bryan A. Wynne, O.D.
Russell Wornall, O.D.

Assistant Clinical Professors

Sangeeta Agarwal, O.D.
Stephanie N. Baba, O.D.
Richard W. Bailey, O.D.
Shrinivas Bares, M.S., M.D.
Karen Chester, O.D.
Selma E. Chen, O.D.
Bobby Christensen, O.D.
John C. Corzine, O.D.
Jorge Cuadros, O.D.
Pierre M. D’Ambrosio, O.D.
Sarah Fisher, O.D., Ph.D.
Dorthe F. Fife, O.D.
Sara Frane, O.D.
Cheslyn M. Gan, O.D.
Michael W. Glenn, O.D.
Robert B. Greer, O.D.
Rita Haroun, O.D.
Heiden, M.D.
Pia Hog, O.D., M.A.
Michelle J. Holt, O.D.
Ivan Huang, M.D.
Stephen Ingman, O.D.
Carl H. Jacobsen, O.D.
Ronald W. Bailey, O.D.
Nicholas G. Kerry, O.D.
Jennine Kirby, O.D.
Carol Lakkis, O.D., Ph.D.
Ghislain Lee, O.D.
David Magnus, O.D.
Kevin K. Maik, M.D.
Ann Mika Moy, O.D.
D. Wesley T. Oda, O.D.
Paul H. Peng, O.D., M.A.
Christopher Quinn, O.D.
Thomas Rowlings, O.D.
Todd D. Severin, M.D.
Andrew Sorenson, M.D.
Masoud A. Sorous, M.D.
Ernest T. Tank, M.D.
Dennis Ulle, O.D.
Richard T. Wacker, O.D.
Meredith Whiteside, O.D.
Chris Willner, O.D.
P. Harold Woodring, O.D.
David N. Yang, O.D.
Donald Yee, O.D.

Clinical Instructors

Stacey Choi, O.D.
Mark Coan, O.D.
Brian P. Den Beste, O.D.
Joseph J. Estrada, O.D.
John O. Fugate, O.D.
Jeffrey A. Hett, O.D.
Salena Lee, O.D.
Carolyn Martin, O.D.
John A. McGreal, Jr., O.D.
Gerald G. Meitore, O.D.
Bruce E. Oneofrey, O.D.
Robert B. Pinkert, O.D.
Jay L. Schlangier, O.D.
Lillian Wang, O.D.
Edward J. Walsoski, O.D.
Mark Williams, O.D.
Laverne M. Zuber, O.D.

Associate Clinical Professors

Sandra Bozhich, O.D.
Denise J. Grassnerl, O.D.
Andrea Le, O.D.
Gerald Louie, O.D.
Vision Science

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 faculty from the School of Optometry and the Departments of Psychology, Computer Science, and Bioengineering, among others. The faculty is distinguished in their accomplishments and diverse in their areas of expertise.

The graduate program provides training in a wide variety of topics relevant to biology of vision. These include the optics of the eye, molecular and cell biology of the eye, anatomy and neurophysiology of the eye and visual pathways. The graduate program is designed to prepare students for a career in teaching and research in the science of vision. Research facilities available to graduate students in vision science are unexcelled anywhere in the world.

Students interested in this graduate program should become familiar with the regulations of the Graduate Division and should contact the graduate student affairs officer or the chair of the Group in Vision Science as early as possible. 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 degree, please contact the Graduate Student Affairs Officer, Group in Vision Science, University of California, Berkeley, 488A Minor Hall #2020, Berkeley, CA 94720-2020, or visit the web site at http://vision.berkeley.edu.

Lower Division Courses

10. The Eye and Vision in a Changing Environment. (2) Two hours of lecture per week. Course covers introductory lectures and laboratory sessions. 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, cataracts). 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 introductory lectures and laboratory sessions. 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, cataracts). 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 Undergraduate Interdisciplinary Studies C10. (SP) Adams

39. Freshman/Sophomore Seminar. Course may be repeated for credit. Section 1 and 2 to be graded on a letter-grade or pass/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. Prerequisites and enrollment limits are set by the faculty, but the suggested limit is 25. (F,SP) Staff

Upper Division Courses

100A. Clinical Examination of the Visual System. (5) Two hours of lecture and six hours of laboratory per week. Fundamentals of the optometric examination. Case history, visual acuities, objective and subjective methods of determining refractive status. Basic examination of anterior ocular structures and the ocular fundus; perimetry. (F)

100B. Clinical Examination of the Visual System. (4) Two hours of lecture and four hours of laboratory per week. Prerequisites: 100A. Classification and epidemiology of refractive errors, evaluation of accommodative and binocular status. Tonometry, advanced techniques of examination of anterior pole, evaluation of visual pathway function. (SP)

100C. Clinical Examination of the Visual System. (4) Two hours of lecture and four hours of laboratory per week. Prerequisites: 100C. Modification of the exam sequence for specific patient needs. Evaluation and management of tear film disorders; analysis of vision with cataract. Patient management and professional communications, and ethical issues; managed care and optometry. (SP)

122A. Optics of Ophthalmic Lenses. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Vision Science 101 and 102. Optical and physical characteristics of ophthalmic lenses, to include: spherical and aspheric lenses, multifocal lens designs, and ophthalmic prisms. Lens power measurement methods, lens thickness power relationships and considerations in designing prescription eyewear. Characteristics of absorptive lenses, ophthalmic coatings, lens materials, and their role in ocular protection. (F)

122B. Advanced Clinical Optics. (2) Two hours of lecture per week. Prerequisites: 122A. Ophthalmic lenses, corneal topography, contact lenses, characteristics of contact lenses, disease processes relating to contact lenses, and pathology of contact lens complications. Contact lens considerations. Contact lens fitting and management. (SP)

126. Systemic Disease. (5) Four hours of lecture and two hours of discussion per week. Prerequisites: Vision Science 106B. This course series 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, cardiac, pulmonary, renal, endocrine, and congenital diseases and their relative ocular manifestations will be presented. 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)

136. Ocular Manifestations of Systemic Disease. (5) Four hours of lecture and two hours of discussion per week. Prerequisites: 126. This course series 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. Basic principles of pharmacology will be followed by overviews of drugs used to treat diseases of each system. The role of the ophtalmologist in the health care system will be emphasized. (SP)

140. Diagnosis and Treatment of Sensory/Motor Accidents. (3) Two and one-half hours per week and 16 hours of laboratory per semester. Prerequisites: Vision Science 117 and 118. Diagnosis and treatment of heterotopia, accommodative, vergence and ocucomotor anomalies including sensory anoma-
141. Advanced Management and Rehabilitation of Sensory/Motor Anomalies. (3) Two and one-half hours of lecture per week. Prerequisites: 140. This course series 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 diseases, and their ocular manifestations will be presented. The basic principles of pharmacology will be followed by overrides of drugs used to treat diseases of each system. The role of the optometrist in the health care system will be emphasized. (F)

150. Low Vision. (2.5) Two and one-half hours of lecture per week. Prerequisites: 106A. 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. (F)

156. Diagnosis and Treatment of Posterior Segment Ocular Disease. (4) Four hours of lecture per week. Prerequisites: 104. This course series 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 overrides of drugs used to treat diseases of each system. The role of the optometrist in the health care system will be emphasized. (SP)

160A. Contact Lenses: Examination Principles and Practice. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: 120B. Examination procedures and instrumentation used in monitoring the ocular reaction to contact lenses. Contact lens refraction, care, and handling. Physical and optical properties of contact lenses. Fitting contact lenses to the human eye, clinical implications. The Sarver Lecture series in Contact Lenses (12 hours on a Saturday and Sunday.) (SP) Harris

160B. Contact Lenses: Principles and Practice. (2) Two hours of clinical preceptorship and one hour of independent study per week. Must be taken on a passed/not passed basis. Prerequisites: 160A. Continuation of 160A. Evaluation and fitting of contact lenses to the human eye, clinical implications. (SP)

160C. Contact Lenses: Advanced Topics/The Sarver Series in Contact Lenses. (1) Thirteen hours of lecture/seminar and two hours of discussion taken over a weekend (two consecutive days). Must be taken on a passed/not passed basis. Prerequisites: 160A. Advanced topics in fitting contact lenses and recent developments in the field of cornea and contact lenses. (SP) Harris

170. Ethics and the Practice of Optometry. (2) Two hours of lecture per week. Prerequisites: 100D. Ethical and social aspects affecting the practice of optometry. Practice options, practice administration, financial aspects, and maintenance of an optometric practice. Epidemiological trends and health care implications. (SP)

190A-190B. Optometry Research Project. (1:1) One hour of lecture and one hour of discussion per week. Credit and grade to be awarded on completion of sequence. Must be taken on a passed/not passed basis. Prerequisites: 120C. Fundamentals of scientific inquiry. Experimental design and data analysis. (F,SP) Cohn

191A-191B. Optometry Research Project. (1:1) One hour of discussion per week. Must be taken on a passed/not passed basis. Credit and grade to be awarded on completion of sequence. Prerequisites: 190A and 190B. Thesis research for optometry students. Presentation of research results. (F,SP) Cohn

Residency Courses

230A-230B. Graduate General Clinical Practice. (2-2-4) Course series may be repeated for credit. Four hours of clinical per credit hour. Prerequisites: O.D. degree. General optometric practice for four hours per week per credit hour, including optometric examination, diagnosis, and management of patients, performed independently by graduate student clinicians. (F,SP)

231A-231B. Graduate Specialty Clinics. (2-2-8) Course may be repeated for credit. Four hours of clinical per week per unit. Prerequisites: O.D. degree. Clinical examination of patients and exploration of a specific clinical specialty. More than one clinical specialty may be taken simultaneously. (F,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 cases. (F,SP)

292A. Graduate Optometry Seminar. (1-3) Course may be repeated for credit. Seminar. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: O.D. degree. Graduate seminars on selected topics in clinical optometry. (F,SP)

298A-298B. Independent or Group Studies. (1-61-6) Course may be repeated for credit. Directed studies. Prerequisites: O.D. degree. Directed studies on a selected topic(s) within optometry. (F,SP)

299A-299B. Graduate Optometry Research. (2-4-2-4) Course may be repeated for credit. Research. Prerequisites: O.D. Degree. Directed research on a selected topic within clinical optometry. (F,SP)

Professional Courses

430B-430C. Optometry Clinics. (9.9) Two hours of seminar per week and a minimum of 18 hours of clinic per week. Must be taken on a passed/not passed basis. Credit and grade to be awarded on completion of a sequence. Prerequisites: 430A. Examination of patients in a primary care setting, prescribing of optometric therapy, management of emergency procedures, and vision screenings of children and adults. (F,SP)

435. Advanced Procedures in Ocular Disease Diagnosis. (1) Two hours of laboratory per week. Instrumentation, techniques, and principles for examination, diagnosis, and treatment of ocular disease. Introduction to optometric informatics related to ocular disease. (F,SP) Peng

440B-440C. Advanced Optometry Clinic. (9.9) Two hours of seminar per week and a minimum of 22 hours of clinic per week. Credit and grade to be awarded on completion of sequence. Must be taken on a passed/not passed basis. Prerequisites: 440A and 441A. Examination of patients in a primary care setting. Diagnosis, prognosis, treatment, patient management and follow-up. (F,SP)

441B-441C. Specialty Clinics. (7.7) Minimum of fifteen to twenty hours of clinic per week. Credit and grade to be awarded on completion of sequence. Must be taken on a passed/not passed basis. Prerequisites: 440A and 441A (offered Summer Session only). Examination, diagnosis, prognosis, treatment, and/or management of patients in specialty clinics; ocular disease, contact lenses, binocular vision, ophthalmic optics, and environmental and occupational vision. (F,SP)

450A-450B. Grand Rounds and Seminar. (2,2) Two hours of discussion per week. Must be taken on a passed/not passed basis. Prerequisites: 440A. For students not currently enrolled in a clinical phase of the curriculum. (F,SP)

452. 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. (1-4) Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Independent study. (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 repeated for credit as topic varies. 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

Upper Division Courses

101. Geometric Optics. (4) Three hours of lecture, two hours of laboratory, and one hour of discussion per week. Prerequisites: O.D. degree. Geometrical methods applied to the optics of lenses, mirrors, and prisms. Thin lens eye models, magnification, astigmatism, prism properties of lenses, thick lenses. (F)

102. Optical System and Physical Optics. (4) Three hours of lecture, two hours of laboratory, and one hour of discussion per week. Prerequisites: 101. Principles of optical systems, principles and clinical applications of apertures and stops, aberrations and optical instruments. Optics of the eye. Selected topics in physical and biological optics. (F)


106A. Anatomy and Physiology of the Eye and Visual System. (4.5) Three and one-half hours of lecture and three hours of laboratory per week. Structure and function of the tissues of the eye, ocular appendages, and the central visual pathways. Introduction to the physiological, 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)

106B. Anatomy and Physiology of the Eye and Visual System. (2) Twenty-six hours of lecture and eight hours of laboratory for seven and one-half weeks. Prerequisites: 106A. Structure and function of the tissues of the eye, ocular appendages, and the central visual pathways. Basic concepts of physiological, 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)
106C. Anatomy and Physiology of the Eye and Visual System. (2) Four hours of seminar for seven and one-half weeks. Must be taken on a passed/not passed basis. Prerequisites: 106A–106B to be taken concurrently. Problem based learning approach, single case examples, and clinical case examples. Continuation of 106A–106B. (F,SP) Fleiszig

115. Visual System Development. (2) Two hours of lecture per week. Prerequisites: 106B. Development of the eye and visual system. Normal development of the developing eye, control of visual pathways, effects of visual deprivation. Assessment of optical and visual function in human infants. Refraction and refractive error in infants and children. Development of visuomotor function, spatial vision, color vision, binocular vision, and depth perception. (F)

117. Oculomotor Functions and Neurology. (2) One and one-half hours of lecture and ten hours of laboratory per week. Prerequisites: 102 or consent of instructor. Neuro-anatomical pathways for the control of eye position and movement; gaze holding, image stabilization and tracking eye movement systems; oculomotor signs of disorders of the central nervous system (palsies, nystagmus, ophthalmoplegia, cog-wheel pursuits, saccadic dysmetria); the near visual-motor response and the synergistic coupling of accommodation and convergence; binocular misalignment (heterophoria and fixation disparity); and presbyopia. (SP)

118. Binocular Vision and Space Perception. (2) One and one-half hours of lecture and ten hours of laboratory per week. Prerequisites: 101 and 102. Perception of space, direction, and distance. Binocular retinal correspondence, horopters, differential magnification effects and anomalies of binocular vision development, selective disorders, local stereopsis, and dynamic stereopsis, binocular depth cues. (SP)

C136. Cell Biology of the Eye and Mechanisms of Ocular Disease. (3) Three hours of lecture per week. Prerequisites: Molecular and Cell Biology 130 or consent of instructor. Structure and function of the eye, regulation of ocular epithelia/neural retina in the normal and diseased state. Cell/molecular analysis of signal transduction cascade that determine lens transparency (cataracts), aqueous humor inflow and outflow (glaucoma); cell adhesion, vitreous-retina (retinal detachments); photoreceptor degeneration (retinitis pigmentosa). Also listed as Molecular and Cell Biology C139W. (F)

199. Supervised Independent Study and Research. (1-20) May be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Upper division status and consent of the instructor, the student’s major adviser and the departmental chair. Supervision of independent 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. (2,2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Graduate seminar in vision science. (F,SP)

204. Optical Formation in the Eye. (3) Two hours of lecture and four hours of laboratory per week. Prerequisites: Graduate standing in vision science or consent of instructor. Fundamental aspects of optical instruments. Measurement of optical properties of simple and compound eyes. Image quality and resolution. Optometric instrumentation. (SP)

206. The Oculomotor System. (3) Two hours of lecture and four hours of laboratory per week. Prerequisites: Consent of instructor. Lectures and laboratory demonstrations on mechanical, physiological, servo-analytical, and behavioral aspects of pupil, accommodation, vergence, and binocular eye movement responses. (SP,SP)

210. Instrumentation and Methodology in Vision Research. (2) One hour of lecture and four hours of laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. Basic concepts of ray, photometry, and colorimetry. Optical bench systems, video and oscilloscope stimulus generation and calibration. Neurophysiological and biological techniques for measurement of eye movements, pupil, accommodation, vergence, and binocular function. Psychophysical methodology, signal detection, computer control of stimuli, data acquisition and processing. Clinical assessment of ocular components; eye examination and function. Clinical trials. (F)

212A. Optics and Diptics of the Eye. (2) Three hours of lecture per week for five weeks plus laboratory assignments. Prerequisites: Consent of instructor. Introduction for graduate students to basic principles of classic and modern geometric optics (thick lens systems, lenses, filters, and stops) and physical optics (interference, diffraction, and polarization) with emphasis on diptics of the human eye (including schematic eyes, aberrations, and entoptic 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 for graduate students. 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 receptive field characteristics and associated visual function. Development and plasticity of the same visual pathways will be discussed and evidence and implications will be explored from controlled rearing procedures and studies of abnormal visual exposure. (F)

212C. Spatial Vision and Machine Vision. (2) Three hours of lecture per week for five weeks plus library assignment. Prerequisites: Consent of instructor. Introduction for graduate students. 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 receptive field characteristics and associated visual function. Development and plasticity of the same visual pathways will be discussed and evidence and implications will be explored from controlled rearing procedures and studies of abnormal visual exposure. (F)

212D. Anatomy and Vegetative Physiology of the Eye. (2) Three hours of lecture per week. Prerequisites: Consent of instructor. Introduction for graduate students to human spatial vision. Contrast sensitivity, visual acuity and spatial localization. Machine vision analogues and models of visual processing of spatial information. (F)

212E. Color Vision and Visual Sensitivity. (2) Three hours of lecture per week for five weeks. Prerequisites: Consent of instructor. Introduction for graduate students to human spatial vision. Color vision and sensitivity to color and light. Sensory aspects of vision including: psychophysical methods, spectral response of the eye, mechanisms of sensitivity control, dark adaptation, color contrast vision, mechanisms of normal and defective color vision. (F)

212F. Eye Movements, Motion Perception and Binocular Vision. (2) Three hours of lecture for five weeks. Prerequisites: Consent of instructor. Introduction for graduate students to human eye movements, motion perception and motor and sensory aspects of binocular vision: including pursuit, vergence and saccadic eye movements, associated lenticular accommodation, stereopsis and binocular spatial perception. Perception of real and apparent motion. (SP)

C216. Color Vision. (2) Course may be repeated for credit with consent of instructor. Two hours of lecture, two hours of laboratory per week. Prerequisites: Consent of instructor. Selected topics from color vision mechanisms, specification, and discrimination, psychophysics and neuro-physiology of color processing. Color and brightness perception. Stiles-color increment threshold measures, interaction of color and form, color vision anomalies. Also listed as Psychology C216B. (SP)

C219. Spatial Aspects of Vision. (2) Course may be repeated for credit with consent of instructor. Two hours of lecture, two hours of laboratory per week. Prerequisites: Consent of instructor. Selected topics from spatial vision: Visual direction, egocentric and oculocentric localization. Pattern vision. Feature detector and spatial frequency filter models, local and global frequency analysis, visual acuity and relation to contrast sensitivity. Spatial aspects of color vision. Also listed as Psychology C216A.

220. Binocular Vision. (2) Course may be repeated for credit with consent of instructor. Two hours of lecture per week. Prerequisites: 118 or consent of instructor. Selected topics from stereopsis and binocular interaction perception. Development of binocular interactions, binocular disparity, binocular space perception and anomalies of binocular vision. (SP)

222. Application of Vision Psychophysics to Clinical Disorders. (3) Course may be repeated for credit with consent of instructor. Two hours of lecture and two hours of laboratory or discussion per week. Prerequisites: Consent of instructor. Selected topics from: Non-invasive techniques in the study of retinal and choroidal disorders, cataracts, glaucoma, strabismus, amblyopia, and various degrees of visual impairment; study of basic laboratory procedures which may be applied to allow identification of site(s) of anomaly in the visual pathways, increase sensitivity in disease detection, and contribute to an understanding of the prognosis for eye disease. (SP)

230. Ethics in Scientific Research. (2) Thirty hours of seminar per semester. This seminar will examine a range of ethical issues that arise in the process of doing research. Beginning with the ethical foundations, we will consider the pathogenesis of fraud, statistics and deception, the ethics of authorship and publication, research with human subjects, the use of animals, the definition and difference between misconduct and questionable research practices, the relationship between industry and science, and finally, the responsibilities and obligations of the scientist. Also listed as Psychology C240A.

C280. Computer Vision. (3) Three hours of lecture per week. Survey of the biology of the nervous system and the visual system; the cellular interactions during development in animals and humans; neurogenesis and neurodegeneration, cell death and synapse elimination; perceptual development, including development of the eye and ear, of the central visual and auditory pathways, and of visual and auditory perception; and the genetic and experiential determinants of neural and perceptual development. Also listed as Psychology C240A.

298. Group Studies, Seminars, or Group Research. (1-6) One to four hours of lecture per week. Group studies of selected topics. Advanced studies in various subjects through special seminars on topics to be selected each year, informal groups studying special problems, group participation in experimental problems and analysis. (F,SP)

299. Research in Vision Science. (1-12) Hours variable. Prerequisites: Consent of instructor. Research. (F,SP)

601. Individual Study for Master’s Students. (1-6) 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 comprehensive examination. Also listed as Computer Science C290. Malik, Forsyth

298. Group Studies, Seminars, or Group Research. (1-6) One to four hours of lecture per week. Group studies of selected topics. Advanced studies in various subjects through special seminars on topics to be selected each year, informal groups studying special problems, group participation in experimental problems and analysis. (F,SP)

299. Research in Vision Science. (1-12) Hours variable. Prerequisites: Consent of instructor. Research. (F,SP)

601. Individual Study for Master’s Students. (1-6) 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 in consultation with the adviser in vision science.
of a language with a grade of C-or better; the first, second, and third levels of language may be taken on a Pass/Not Pass 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. However, transcripts must be provided and evaluated by an adviser.

(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. Another option for those with advanced language ability is to place into a language course beyond the fourth semester and obtain the instructor’s note to that effect.

(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 of high school.

Core Courses. Six courses give the scope of the discipline in historical, theoretical, and practical terms. The core also includes credit for internships and a senior seminar.

Survey Areas. To provide a breadth of subject areas and the background necessary for the development of one’s concentration topic, students must complete one course from each of five broad subject areas: peace, war, and global systems; ethics, culture, and power; conflict analysis, social change, and nonviolent resolution; political economy and development; and environment, population, and resources.

Area of Concentration. This is the central theme that students develop individually and that unifies their major. Six courses must relate to one’s chosen area of concentration, two of which may overlap with survey courses if appropriate. All of the concentration courses must be approved by an adviser.

Human Diversity. Given that social and cultural differences are major contributors to human conflict, all PACS majors must address four aspects of human diversity either in coursework or in a research project conducted for a course which has already been taken for the major but which might not otherwise directly address human diversity issues.

The Major

Core Courses—Lower Division. PACS 10, 25. Upper Division. PACS 100, 186, 187, 190. To declare peace and conflict studies, students must have (1) completed PACS 10 as well as one additional course each from the major; (2) completed at least two semesters of college-level language or the equivalent; (3) completed at least 30 semester units of course work. Students must declare no later than the term preceding their final term. Transfer students must have completed one semester of course work at Berkeley before declaring. A detailed description of the major requirements is available in the Teaching Program Office.

Honors. Majors in peace and conflict studies who have maintained a 3.5 GPA in the major and a 3.0 GPA overall in course work undertaken at Berkeley are eligible to apply for the honors program. Admission to the program requires the written approval of a faculty sponsor and the program chair. Candidates for honors are then required to conduct independent research and write a thesis under PACS H195. Departmental honors are awarded upon completion of the honors course with a grade of B or better and a GPA of 3.3 in both the major and overall in the student’s last semester at Berkeley.

The Minor

The minor in PACS consists of six upper division courses. A minimum of three must be upper division PACS courses. The remaining courses must be selected from one (only) of the five PACS Survey Areas. Applications for the minor and survey course lists are available from the IAS Teaching Program Office. Minor applications must be submitted no later than the last day of instruction of the semester immediately preceding the final semester.

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 taken for a letter grade; (3) a minimum GPA of 2.0 must be achieved in the courses used to satisfy the minor requirements; (4) no more than one course can satisfy requirements for both a major and a minor; (5) minor courses must be completed within the 130-unit maximum limit for graduation.

Lower Division Courses

10. Introduction to Peace and Conflict Studies. (4) Three hours of lecture and one hour of discussion per week. This course will explore pacific causes of violence and war and the processes that lead to justice and peace. This course is required for majors but not-majors are welcome. (F,SP) Sanders

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. The Berkeley 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. Berkeley Seminaries are offered in all departments, and may be taken in departments and have completed within the 130-unit maximum limit for graduation. (F,SP)

25. Critical Thinking and Research Methodology. (3) Three hours of lecture per week. Prerequisites: 10 or consent of instructor; for majors or intended majors only. This is a course in how to think critically about policy research, in which scientific and value structures inevitably become merged. It prepares students to make independent, reasoned decisions regarding the explicit integration of scientific considerations and ethical concerns in their approach to the research. (SP)

98. Directed Group Study. (1-3) Course may be repeated for credit. One to four hours of lecture/group study per week. Must be taken on a passed/not passed basis. (F,SP) Sanders

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 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) Sanders

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 become familiar with the body of literature and major debates in peace studies and research. (F,SP) Sanders

119. Special Topics in Peace and Conflict Issues. (3) Course may be repeated for credit as topic varies.
Two hours of lecture and two hours of discussion per week. Topics vary from semester to semester. Check with the PACS office for precise schedule of offerings.

125AC. War, Culture, and Society. (4) Three hours of lecture and one hour of discussion per week. 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 succeeding generations of men and women. It will provide a special note of the role of race, ethnicity, and class as prisms that filter this process. Course also explores how different interpretations of democracy and nationalism have served as a catalyst for social conflict and that filter this process. Course also explores how differences 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 builds cumulatively from simple negotiations and mediations to those of greater complexity, using a combination of cases, readings, and exercises to help students develop understanding and skill with multi-party, multi-issue disputes that evolve over time, particularly community disputes. Special emphasis will be given to the theory and technique of diffusing/de-escalating volatile and angry conflict. (F,SP) Erbe

153. Advanced Conflict Resolution. (4) Four hours of lecture per week. Prerequisites: 150 or consent of instructor. This course presents advanced theoretical foundation and procedural framework for interest-based conflict analysis and resolution and third party intervention and its importance to the current focus on mediation. The course builds cumulatively from simple negotiations and mediations to those of greater complexity, using a combination of cases, readings, and exercises to help students develop understanding and skill with multi-party, multi-issue disputes that evolve over time, particularly community disputes. Special emphasis will be given to the theory and technique of diffusing/de-escalating volatile and angry conflict. (F,SP) Sanders

127A. Human Rights. (3) Three hours of lecture per week. An introduction to the developing international protection and promotion of human rights. The course supplies a foundation for understanding legal, political, philosophical, and economic aspects of human rights. We will examine United Nations, regional, and national systems on human rights; ideological and cultural perspectives; U.S. policy and practice; women's human rights; sources of violations; and nongovernmental organizations. (F,SP) Staff

127B. Human Rights. (3) Three hours of lecture and one hour of seminar per week. Prerequisites: 127A or consent of instructor. Five special issues will be analyzed in depth in the context of human rights: United Nations; democracy and development; universality and cultural relativism; the three regional systems; and women's rights. (F,SP)

128AC. Human Rights and American Cultures. (4) Four hours of lecture per week. The course analyzes the theory and practice of human rights for three groupings in the United States and examines questions: How are they as they are established 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 from semester to semester. The course will offer a critical interdisciplinary study of geo-political regions and the sources of the international conflict. (F,SP) Guido Bacciagaluppi, Ph.D.

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 phenomenon of globalization. Particular attention will be given to the changing economic and social integration, ethnico-religious nationalism and identity politics, domestic politics, and foreign policy. Special emphasis is 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 mediators or arbitrators. The course will look at the sources of conflict, including multicultural aspects, and will emphasize the opportunities for growth and development in conflictive incidents. (F,SP) Erbe

151. International Conflict: Analysis and Resolution. (3) Three hours of lecture per week. Inspired by the changed 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,SP) Sanders

154. Multicultural Conflict Resolution. (4) Four hours of lecture per week. Prerequisites: 150 or consent of instructor. This course will investigate the special issues involved with facilitating resolution of cross-cultural conflicts. Topics will include cultural conflict, (e.g., race, class, cultural background and problem solving styles), mediator (facilitator/negotiator), credibility, cultural (including gender) contributions to conflict resolution and unique ethical dilemmas. Course includes field resolutions for evaluation and design, and the opportunity to participate in mediation of a cultural mediation. (F,SP) Erbe

155. Ethics of Conflict Resolution. (4) Four hours of lecture per week. This course investigates ethical issues and perspectives in relation to peace and conflict studies, with emphasis on communication and conflict resolution processes and special emphasis on analyzing the third party intervenor's ethical responsibilities and dilemmas in facilitating collaborative conflict resolution and appreciating cultural context and meaning. Case studies will be used to examine and formulate ethical approaches to issues such as cultural competence, neutrality and impartiality, power and vulnerability, and procedural fairness. (F,SP) Erbe

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 pass/not passed basis. Prerequisites: 150, 153, 154, 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,SP) Erbe

164. Nonviolence. (3) Three hours of lecture per week. Explores the theory, the history, and the possible future of non-violence as articulated or inferred in the work of its major practitioners. (F,SP) Nagler

166. Peace and Conflict Studies Internship. (2-4) Course may be repeated for a maximum of 4 units. Six to fifteen hours of internship per week. Must be taken on a pass/not passed basis. Prerequisites: 10 or consent of instructor. Supervised internship in selected community agencies concerned with peace and justice. Placement relevant to student’s academic interests and career objectives. Minimum 45 hours per semester for credit earned. Required for PACS majors and normally restricted to them. (F,SP) Staff

187. PACS Internship Seminar. (1) One hour of seminar per week. Must be taken on a pass/not passed basis. Prerequisites: 10; upper division standing or consent of instructor. 186 (may be taken concurrently). Provides students with the structure for determining an internship that is an advanced and challenging practice experience. Topics include: evaluation and problem-solving skills used in a variety of peace and justice work settings. Students are expected to put peace theory to work in a variety of peace and conflict oriented institutional settings: look at values and ethics, the use of social science and other methods and skills. Required for PACS majors and normally restricted to them. (F,SP) Staff

190. Senior Seminar. (2) Two hours of seminar per week. Students prepare a major analytical paper synthesizing what they have learned in the major and do an oral presentation on their area of concentration. Open to PACS majors only. To be taken in the final year of study. (F,SP) Staff

195. Senior Thesis. (3-4) Three hours of research per unit per week. Prerequisites: Senior standing in PACS. Research paper or suitable project done under the direct supervision of a faculty sponsor. Subject must be approved by faculty sponsor no later than the preceding semester in which the course is to be taken. (F,SP)

H195. Honors Course. (1-4) Regular individual meetings with faculty sponsor. Prerequisites: Senior standing; 3.3 GPA in major; 3.0 GPA overall in coursework undertaken at Berkeley; must be admitted to PACS Honors Program. The student will complete a primary research and writing project based on study of an advanced topic with faculty sponsor. Application and information available in PACS adviser’s office. (F,SP)

197. Field Studies. (1-4) Course may be repeated for credit. Field work and independent meetings with faculty sponsor. Must be taken on a passed/not passed basis. Prerequisites: 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. Consent of instructor required. (F,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. Student initiation in choice of subjects is solicited and welcome. (F,SP)

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,SP)

Philosophy (College of Letters and Science)

Department Office: 314 Moses Hall, (510) 642-2722
Staff: Philosophy / 367
Chair: Richard Wollheim, M.A.

Professors
Alan Code, Ph.D.
Hubert L. Dreyfus, Ph.D.
Samuel Scheffler, Ph.D.
Benson Mates, Ph.D.
Thompson Clarke, Ph.D.
Hans Sluga, B.Phil.
Richard Wollheim, M.A.
Barry G. Stroud, Ph.D.
Donna Tavrow, Ph.D.
Donald H. Davidson, Ph.D.
Frits Staal, Ph.D.
Joseph Tussman, Ph.D.
Thompson Clarke, Ph.D.
Benson Mates, Ph.D.
Walter Sinnott-Armstrong, Ph.D.
Bernard Williams, M.A. (Deutsch Professor)
Ernest Adams, Ph.D. (Emeritus)
Charles S. Chihara (Emeritus), Ph.D.
Hans Sluga, B.Phil.
William Craig, Ph.D. (Emeritus)
Gregory W. Daston, Ph.D.
Wallace I. Matson, Ph.D. (Emeritus)
Joseph Tussman, Ph.D.
Bruce J. Vermazen (Emeritus), Ph.D.

Associate Professors
Janet Broughton, Ph.D.
*Recipient of Distinguished Teaching Award
Daniel Warren, Ph.D., M.D.
Richard Wellham, M.A.
Paolo Mancosu, Ph.D.
Richard Wellham, M.A.
Paolo Mancosu, Ph.D.
Donald H. Davidson, Ph.D.
Frits Staal, Ph.D. (Emeritus)
*Hubert L. Dreyfus, Ph.D.
Hans Sluga, B.Phil.
Jovanovic available in PACS adviser’s office. (F,SP)
*Professor of the Graduate School
The Major

Lower Division. 12A or 14A, 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 one group):

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 in addition to the four required upper division courses. Students must take one course from the 160-170 series and 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 or 14A 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, provided that the course is selected for discussion by the major adviser to be relevant to the major. One course in the major may be taken on a passed/not passed basis.

Honors Program. With the consent of the major adviser, a student with an overall 3.5 grade-point average and a grade-point average 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 Philosophy Department, 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 on a letter-graded basis. Students must have an overall grade-point average of 2.0 in all six courses required for the minor. A grade-point average 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,SP) Sluga

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 relationship between mind and body; the structure of action; the nature of desires and beliefs; the role of the unconscious. (F,SP) Searle

4. Knowledge and Its Limits. (4) Three hours of lecture and one hour of discussion per week. Introduction to the theory of knowledge. (F,SP)

5. Science and Human Understanding. (4) Three hours of lecture and one hour of discussion per week. Introduction to the philosophy of science.

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.

7. Existentialism in Literature and Film. (4) Three hours of lecture and one hour of discussion per week. Existentialism, alysis, and existentialism as expressed in the works of Dostoyevsky, Melville, Kafka, Antonioni, Godard, etc. (F,SP) Dreyfus

8. Introduction to Philosophy of Art. (4) Three hours of lecture and one hour of discussion per week. This course will identify the central features of art, and will consider alternative approaches to art. Topics will include: the definition of art, the institutional theory of art, intention, media of art, ontology of art-works, representation, expression, metaphor, and value. (F,SP) Wolfenstein

9. Chinese Philosophy. (4) Three hours of lecture per week. An introduction to Chinese philosophical thought. The main ideas of different schools of thought, including Confucianism, Taoism and Buddhism, will be presented through a study of representative thinkers and texts. Various topics will be highlighted, including: Chinese conceptions of the self, theories of human nature, accounts of the ethical ideal, and views about self-cultivation.

10. Comparative Ethics. (4) Three hours of lecture per week. A comparative study of topics in Chinese and Western ethical traditions. Topics include love, compassion, benevolence; rituals, filial obligations, the individual and the family; pride, shame, guilt; conscience, righteousness, forms of integrity; concepts of the self; self-cultivation; human nature, destiny, the cosmic order; the concept of morality, morality and tradition. The course will conclude with a discussion of metaethical issues concerning the confrontation between rival ethical traditions and methodological issues in the study of comparative ethics. Shun

12A-12B. Introduction to Logic. (4,4) Three hours of lecture and two hours of discussion 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. Enrollment is limited to 15 freshmen.

25A. Ancient Philosophy. (4) Three hours of lecture and one hour of discussion per week. The history of ancient philosophy with special emphasis on the Presocratics, Plato, and Aristotle. (F) Code

25B. Modern Philosophy. (4) Three hours of lecture and one hour of discussion per week. An introduction to modern philosophy from Descartes to Kant. (SP) Ginsborg

39. Freshman Seminar. Course may be repeated for credit. Three hours of seminar per week. Study of various topics are available in the departmental guide of each semester in which the course is given. Freshman seminars are offered in all campus departments, and topics vary from department to department. Enrollment is limited to 15 students each.

Upper Division Courses

General prerequisites: Students enrolling in any of the following upper division courses should have completed at least 8 units in philosophy. Additional prerequisites are indicated in certain courses.

100. Philosophical Methods. (4) Two hours of lecture and two hours of discussion per week. Prerequisites: Two courses from 2, 4, 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 these texts. Students should begin as early as possible after declaring the major. (F,SP) Warren

104. Ethical Theories. (4) Three hours of lecture and one hour of discussion per week. The fundamental concepts and problems of morality examined through the study of classical and contemporary philosophical theories of ethics. (F)

105. Foundations of Ethics. (4) Three hours of lecture per week. An advanced investigation of fundamental questions about the nature of morality. Schef- fli

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, moral education. Williams

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.

113AC. Philosophical Perspectives on Race and Culture. (4) Three hours of seminar per week. The aim of the course is to examine some of the philosophical issues relevant to an understanding of race and culture in the context of present-day American society. The course is intended for juniors and seniors with some background in philosophy, and it will consist of a weekly three-hour seminar in which students will have an opportunity to present material and to discuss issues in depth. Students will write a short paper every week, the readings for the next session and a final paper of 12-15 pages. This course satisfies the American cultures requirement. Ginsborg

115. Political Philosophy. (4) Three hours of lecture per week. Analysis of political obligation and related problems. (F) Scheflier, Sluga

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 redistributive justice; republicanism, nationalism, and cosmopolitanism. Scheflier

118. Philosophy of Law. (4) Three hours of lecture per week. Philosophical problems arising in the legal context.

122. Theory of Knowledge. (4) Three hours of lecture and one hour of discussion per week. Stroud

125. Metaphysics. (4) Three hours of lecture per week.

128. Philosophy of Science. (4) Three hours of lecture per week. A survey of main topics in the logic of science and of other issues coming under the general heading of philosophy of science.

129. Special Topics in the Philosophy of Science. (4) Three hours of lecture per week. A discussion in some depth of one or a few special issues in, or approaches to, the philosophy of science. Details of current topics are available in the departmental guide of each semester in which the course is given.

130. Philosophy of Social Science. (4) Three hours of lecture per week. Philosophical topics arising from psychology, economics, sociology, etc. Searle

131. Philosophy of Action. (4) Three hours of lecture per week. Prerequisites: An Introduction to Logic. The course will explore the following questions: What is an action? What is rational action? What is the structure of practical arguments? What is the structure of explanations of actions?

132. Philosophy of Mind. (4) Three hours of lecture per week. Mind and matter; other minds; the concept "person." Searle
133. Philosophy of Language. (4) Three hours of lecture per week. (F,SP) Seayle
135. Theory of Meaning. (4) Three hours of lecture per week. Prerequisites: One course in logic or consent of instructor. Language as social behavior. Language compared to other sign systems. The foundation of our social truth, meaning, reference. Issues of logical form in belief sentences, indirect discourse, sentences about causality, events, actions. Relations between thought and language.
C139. Mind and Brain: Intentionality in Philosophy, Neurobiology, and Cognitive Science. (3) Three hours of lecture per week. An examination of the philosophy of Schopenhauer and Nietzsche. Sluga
136. Wittgenstein. (4) Three hours of lecture per week. Formally 188. Sluga
187. Special Topics in the History of Philosophy. (4) Course may be repeated for credit. Three hours of lecture per week. The course’s specific content will vary from occasion to occasion but either the course will focus narrowly upon problems drawn from the work of a philosopher in the 160 to 178 series, or it will study several influential philosophers before the twentieth century, who shared a common outlook or who were linked by other types of philosophically significant reaction to one another’s work. (F,SP)
188. Phenomenology. (4) Three hours of lecture per week. Formally 186. Backgrounds of phenomenology and existentialism. Husserl and Merleau-Ponty. (F,SP)
H195. Philosophy Tutorial. (4) Three hours of tutorial per week. Prerequisites: Students in Honors Program. The department will designate a tutor, under whose guidance the student will seek to satisfy the thesis requirement of the Honors Program. (F,SP)
198. Philosophy Seminar. (1-4) Course may be repeated for credit. Tutorial. One unit per weekly hour of instruction. Must be taken on a pass/not pass basis. Prerequisites: Consent of instructor. Directed study on special topics. (F,SP)
199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Tutorial. Open to qualified students wishing to pursue special studies. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Independent study. 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 of the Ph.D. (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. Independent study. 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 of the Ph.D. (F,SP)
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)

Physical Education

Physical Education / 369

Physical Education (College of Letters and Science)
Office: 200 Hearst Gymnasium, (510) 642-3289
http://pe.berkeley.edu
Director: M. Kathryn Scott, M.A.
Supervisor of Physical Education
M. Kathryn Scott, M.A.
Lecturers
Keri Barrett, M.S.
Justin Caraway, M.A.
Sue Johansen, M.A.
Susan Li-June, M.A.
Tony Mar, M.S.
Elmar Stefke, M.A.
Michael Ut, M.S.
Jin Yoon, M.S.
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, gymnastics, dance, fitness, and sports.
classes. 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 Schedule of Classes for precise information regarding each semester’s offerings.

Scientific Diving. The Division of Diving Safety ensures that all underwater diving conducted under the auspices of the University of California, Berkeley is done in accordance with the standards and policies set forth by the American Academy of Underwater Sciences and the Berkeley campus. The program is administered by the diving safety officer in association with the Vice 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. Further information can be found at http://pe.berkeley.edu.

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 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 section by activity and time preferences. Students should consult the 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 intermediate level. Students select section by activity and time preferences. Students should consult the 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 advanced level. Students select section by activity and time preferences. Students should consult the 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 advanced level. Students select section by activity and time preferences. Students should consult the 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 section by activity and time preferences. Students should consult the 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. Variety of intercollegiate sports for men. Students should select section by activity and time preferences. Students should consult the 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. Variety of intercollegiate sports for women. Students should select section by activity and time preferences. Students should consult the Schedule of Classes each semester to determine the particular activities available. (F,SP) Scott

8. Supervised Group Study. (1-4) Course may be repeated for credit. One to four hours of laboratory per week. Students select section by activity and time preferences. Students should consult the Schedule of Classes each semester to determine the particular activities available. (F,SP) Staff

Field Major in Physical Sciences

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. Plan A, which is based on Physics 7, 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 sciences can major in physical science and at the same time acquire the necessary pre-professional preparation. For example, Plan A, together with organic chemistry and a year of biology, will meet the entrance requirements of most medical schools. 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.
Plan A
(Broad introduction to physical science)

Lower Division Courses. Mathematics 16A-16B; 55; Physics 8A-8B; Chemistry 1A-1B; Computer Science Y.

Upper Division Courses. Physics 132; Chemistry 130A-130B; Vision Science 101; Statistics 131A.

Electives in physical sciences, mathematics and statistics, with the approval of the adviser to complete a total of 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 adviser.

Plan B
(Of departmental concentration)

Lower Division Courses. Mathematics 1A-1B, 53, 54; Physics 7A-7B-7C; Chemistry 1A-1B or 4A-4B.

Additional Required Courses. Geology 50/50L or Geology 100A or Astronomy 7A, 7B, 149, or 159.

Upper Division Courses. 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 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 adviser.

Honors Program. Students with a grade-point average overall and in the major of at least 3.3 may wish to participate in an honors program leading to graduation with honors. The honors program will be administered by the advisers of work in a department honors program with a senior thesis.

Single Subject Teaching Credential. All credential candidates must be certified under the provisions of the California Teacher Preparation and Licensing Law, effective August 1970. Prospective single subject teachers in physical science are encouraged to complete the field major in physical sciences. Students may be required to pass a state examination in addition to completing a program of professional preparation.

For further information on requirements for the Single Subject or Multiple Subject Credential, see the Announcement of the School of Education.

Physics
(College of Letters and Science)

Department Office: 366 LeConte Hall, (510) 642-7166
Chair: Christopher F. McKee, Ph.D.

University Professors
Mount, Patricia, Ph.D. University of Chicago. Theoretical condensed matter physics

Assistant Professors
Edwina B. Lenox, Ph.D. University of California, Berkeley. Astrophysics, theoretical condensed matter physics

Adjunct Professors
A. Carl Helmholz, Ph.D., Sc.D. (Emeritus)
Erwin L. Hahn, Ph.D. (Emeritus)
†Frederick Reif, Ph.D. (Emeritus)
William Chinowsky, Ph.D. (Emeritus)
Geoffrey F. Chew, Ph.D. (Emeritus)
Kinsey A. Anderson, Ph.D. (Emeritus)
Robert R. Brown, Ph.D. (Emeritus)
Owen Chamberlain, Ph.D. (Emeritus)
Geoffrey F. Chew, Ph.D. (Emeritus)
William Chinnosky, Ph.D. (Emeritus)
Francis S. Crawford, Ph.D. (Emeritus)
Kenneth M. Crowe, Ph.D. (Emeritus)
†Sumner P. Davis, Ph.D. (Emeritus)
Richard Marrus, Ph.D. University of Cambridge. Experimental condensed matter physics

†John Clarke, Ph.D. University of Cambridge. Experimental condensed matter physics

*Professor of the Graduate School
†Professor of the Graduate School
‡Recipient of Distinguished Teaching Award

Physics / 371
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 complete 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 Science specifications and will consist of the following course work:

Prerequisites. Physics 7A, 7B, 7C (or their equivalents); Mathematics 21A. These courses may be taken concurrently.

Minor Requirements. Physics 176A; Physics 110A or Physics 105. Three additional upper division physics courses to total at least 9 units for an upper division physics unit total of at least 17 units. 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 may be granted transcripts (official or unofficial) to the undergraduate assistant (in 368 Le Conte Hall) to show their work and grade-point average in physics and math. After completing a confirmation of minor program petition (available in 368 Le Conte Hall) the students will be directed to a physics 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 Science.

For more information regarding this program please contact the undergraduate assistant at (510) 642-0481.

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. In addition to applications and transcripts of undergraduate work, applicants for admission must submit scores of the General and Physics Graduate Record Examination tests. Detailed information concerning admission, graduate student instructor appointments, fellowships, and degree requirements is given in a departmental brochure which is available upon request from the graduate assistant, Department of Physics.

Research is a major part of the Ph.D. program, and the department offers opportunities in a wide variety of experimental and theoretical fields. The field research includes atomic physics and spectroscopy, astrophysics, biophysics, cosmic rays, mass spectroscopy, nonlinear optics, condensed matter physics, and statistical mechanics. At the Lawrence Berkeley National Laboratory, extensive opportunities exist for research in elementary particle and nuclear physics, condensed matter physics, and materials science, plasma physics, and on energy and environmental problems. Space physics, interplanetary studies, solar plasma research, atmospheric science, and other problems are pursued both in the Physics Department and at the Space Sciences Laboratory.

Course requirements for the Ph.D. include the following courses: Physics 210A (Classical Physics: Particle Dynamics, Electromagnetic Interactions, and Continuum Mechanics), Physics 210B (Classical Physics: Electromagnetism) and Physics 221A-221B (Quantum Mechanics) plus 19 units (five semester courses) of material selected from upper division or graduate courses (not including any compulsory upper division material required for the undergraduate major), of which at least 11 units must be in the 200 series courses. Some of the 19 units could include prerequisites, biophysics, biophysics, or astrophysics. Mathematics 224A-224B (Mathematical Methods for the Physical Sciences) is recommended. Physics 251, 250, 295, 299, 300, and 502 are excluded from the 19 units considered above. Physics 210A-210B and 221A-221B must be completed for letter grades (averaging at least a B). No more than one-third of the Ph.D. program may be fulfilled by courses graded Satisfactory, In the and 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 36 semester units of upper division and graduate work in physics (related fields) with an average grade of at least a B. Eighteen of these units must represent graduate courses in physics. Neither upper division courses included in the departmental (undergraduate) major requirements nor Physics 251, 250, 295, 299, 300, and 502 may be used to satisfy the 36-unit requirement. No more than one-third of the master’s program may be fulfilled by courses graded Satisfactory, and then only if approved by the department.

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 designed for pre-medical students, students in architecture, and students in the biological sciences. Physics 10 is recommended for the nonscience major who wishes to gain some understanding of basic physical concepts. These courses fulfill, in part, the natural science requirements of the College of Letters and Science.

All students planning to take lower division courses, except Physics 10, should have completed trigonometry.

7A. Physics for Scientists and Engineers. (4) Three hours of lecture and four hours of laboratory per week. Prerequisites: High school physics; Math 1A or 1AS; Math 1B or 1BS (which may be taken concurrently). Mechanics and wave motion. (F,SP) Staff

7B. Physics for Scientists and Engineers. (4) Three hours of lecture and four hours of laboratory 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, Math 53, 54 (Math 54 may be taken concurrently). Electromagnetic waves, optical physics, relativity, and quantum physics. (F,SP) Staff

H7A-H7C. Physics for Scientists and Engineers. (4;4;4) 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). Honors sequence corresponding to 7A-7B-7C, but with a greater emphasis on theory and 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 one hour of discussion per week plus thirty hours of laboratory per semester. Prerequisites: Mathematics 16A or equivalent or consent of instructor. Mechanics, wave motion, electrostatics and heat. Some topics of biological interest are usually included in sections 8A-8B. (F,SP) Staff

8B. Introductory Physics. (4) Students with credit for 7B or 7C will not receive credit for 8B. Three hours of lecture and one hour of discussion per week plus thirty hours of laboratory per semester. Prerequisites: 8A or equivalent. Electromagnetism, optics and heat, mechanics, wave motion. (F,SP) Staff

10. Descriptive Introduction to Physics. (3) Not open to students who have taken any of 7A-7B-7C, H7A-H7B-H7C. Three hours of lecture and one hour of discussion per week. Prerequisites: Open to students with or without high school physics. A brief presentation of some of the more important phenomena in physics with experimental illustration. (F,SP) Staff

21. Physics of Music. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: No previous courses in Physics 7A-7B. Physics 10 is recommended. Physical principles encountered in the study of music. The applicable laws of mechanics, fundamentals of sound, harmonic concepts, laws of sound production, musical instruments, musical scales. Numerous illustrative lecture demonstrations will be given. Only the basics of high school algebra and geometry will be used.

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 Berkeley 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. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP) Staff

39. Lower Division Physics Seminar. (1.5) Course may be repeated for credit. Seminar format. Must be taken on a passed/not passed basis. Prerequisites: Enrollment by consent of instructor during the week of pre-enrollment. Consult bulletin boards outside 366 Le Conte Hall for more information. 6-12 students per section. Physics seminar course designed for both non-major students and students considering a major in physics. Topics vary from semester to semester. (F,SP) Staff

49. Supplementary Work in Lower Division Physics. (1-3) Course may be repeated for credit. Meetings are arranged. Students with partial credit in lower division physics courses may, with consent of instructor, complete the credit under this heading. (F,SP) Staff

Upper Division Courses

Courses 7A-7B-7C (regular or honors) and differential and integral calculus are prerequisite to all upper division courses except Physics 132.

100. Communicating Physics and Physical Science. (1-2) Two hours of lecture assumed per week. For undergraduate and graduate students interested in improving their ability to communicate scientific knowledge by teaching science in K-12 schools. The course will combine instruction in inquiry-based science teaching methods and learning pedagogy with 10 weeks of supervised teaching experience in a local school. Students will practice, with support and mentoring, 1-2 hours per week including time spent in school classrooms. Approximately three hours per week including time spent in school classrooms. 2-3 units depending on completion of a special project. (SP) Birkett
105. Analytic Mechanics. (3) Three hours of lecture and one hour of discussion per week. Newtonian mechanics, motion of a particle in one, two, and three dimensions, central force motion, moving coordinate systems, statics, potential energy, conservative and non-conservative forces, Lagrange’s equations, rigid body dynamics, tensor analysis techniques. (F,SP) Staff

108. Laser Physics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 110A-110B, 137A-137B. This course, a survey of recent developments in solid state and atomic physics, is intended to provide the student with some basic research tools needed for graduate school and for industry. Basic physical principles, e.g., semiclasical laser theory, will be discussed. Applications include, e.g., diode, thruster, Starfire, dye, and eximer lasers. Applications will also be discussed, e.g., to spectroscopy, to the laser cooling of atoms, and to optical fiber communications. (SP)

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 a maximum of nine units. Required for chp students majoring in physics. Nine units may be taken for credit. No more than 3 units may be completed in one semester. Eight hours of laboratory per week. Prerequisites: 137A or consent of instructor. Semiconductors Circuits (BSC), covers introductory analog and digital circuits. The class meets for two 4-hour afternoon lab sessions, and a one and one-half hour weekly lecture. In the second semester, Advanced Lab (3 units), students complete 4 of 20 advanced experiments. These include many in atomic, nuclear, classical, and solid-state physics, among others. To receive credit, enrollment must be approved in the third semester for variable units. (F,SP) Staff

112. Introduction to Statistical and Thermal Physics. (4) Three hours of lecture and one hour of discussion per week. Basic concepts of statistical mechanics and quantum statistical mechanics and applications to macroscopic systems, condensed states, phase transformations, quantum distributions, elementary kinetic theory of transport processes, fluctuation phenomena. (F,SP) Staff

124. Introductory Nuclear Physics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 127A. Tools of nuclear physics, alpha, beta, and gamma decay, nuclear interactions and structure, brief introduction to particle physics. (F) Staff

129A-129B. Particle Physics. (4/4) Three hours of lecture and one hour of discussion per week. Prerequisites: 137A-137B (137B may be taken concurrently). Tools of particle and nuclear physics. Properties, classification and interaction of particles including the quark-gluon constituents of hadrons, high energy phenomena analyzed by quantum mechanical methods. 129A will survey the field including some related topics in nuclear physics. 129B will develop more quantum mechanical ideas, topics such as quantum number determinants of resonances, hadron structure functions, introductory electro-weak theory with Dirac matrices, grand unified theories. (F,SP) Staff

132. Contemporary Physics. (3) Not open for credit to students who have completed 137A. Three hours of lecture and one hour of discussion per week. Prerequisites: 8A-BB or equivalent or consent of instructor. A general descriptive course of selected topics in contemporary physics. Examples include and do not include topics from special and general relativity, atomic and nuclear physics, radiation, fundamental particles and their symmetries, superconductivity and superfluids, ultraviolet catastrophes, astrophysics, and cosmology. (SP) Staff

137A-137B. Quantum Mechanics. (4/4) Three hours of lecture and one hour of discussion per week. Introduces the tools and techniques of quantum mechanics with applications to atomic, molecular, solid state, nuclear and elementary particle physics. (F,SP) Staff

138. Modern Atomic Physics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 137A-137B. This course has two goals: 1) The description of a large number of properties of atomic energy levels based on the central field approximation. The ideas developed in this course are widely used in solid state, particle and nuclear physics. 2) The description of a large number of properties of atomic and molecular systems, and some of the important physics obtained from them. Examples are magnetic resonance, lasers and masers, ion and neutral atom traps, optical pumping and closed loops. (F) Staff

139. Special Relativity and General Relativity. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 105, 110A or consent of instructor. Historical and experimental foundations of Einstein’s special theory of relativity; spatial and temporal measurements, particle dynamics, electrodynamics, Lorentz invariants. Introduction to general relativity. Selected applications. Designed for advanced undergraduates in physics and astronomy. (SP) Staff

141A-141B. Solid State Physics. (4/3) Three hours of lecture and one hour of discussion per week. Prerequisites: 137A-137B; 137B may be taken concurrently. A thorough introductory course in modern solid state physics. Crystal symmetries; classification of solids into metals, covalent, ionic, and molecular substances; interatomic forces, lattice vibrations, electronic, and particle waves in periodic lattices; thermal magnetic and dielectric properties of solids; energy bands of metals and semiconductors; superconductivity; magnetic substances; ferromagnetism; ferri- and ferrimagnetism; magnetic resonances. (F,SP) Staff

142. Introduction to Plasma Physics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 105, 110A-110B (110B may be taken concurrently). Various topics in nonlinear optics and plasma physics, including and not limited to: 1) Laser plasmas on current theoretical and experimental basis. A seminar which includes study and research. (SP) Staff

C160A. Stellar Physics. (4) Four hours of lecture and one hour of discussion per week. Prerequisites: Senior standing in astronomy or physics or consent of instructor. Physics 112 (may be taken concurrently) and either Physics 110A-110B or Physics 137A-137B. Observational constraints on the properties and evolution of stars. Theory of stellar structure. Stellar atmospheres and stellar evolution of high and low mass stars: supernovae. Degeneracy of matter and structure of collapsed stars. Elements of gas dynam- ics, accretion onto compact objects, and x-ray sources. Dynamics and evolution of close binary systems, stellar pulsation, stellar evolution. Also listed as Astronomy C160A. (F) Filipenko

C160B. Relativistic Astrophysics and Cosmology. (4) Four hours of lecture and one hour of discussion per week. Prerequisites: Senior standing in astronomy or physics or consent of instructor. Physics 112 (may be taken concurrently) and either Physics 110A-110B or Physics 137A-137B. A prior knowledge of astrophysics comparable to that offered in Astronomy 7A-B is assumed. The literature on relativistic astrophysics. Relativity of physics, cosmic rays, black holes. The cosmological distance scale, elementary cosmological models, properties of galaxies and quasars. The mass density of the universe. Evidence for dark matter and concepts of the early universe and of galaxy formation. Reflections on astrophysics as a probe of the extrema of physics. Also listed as Astronomy C160B. (SP) Holzapfel

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, carbohydrates, lipids, proteins, membranes, transmembrane transport systems, and their implications. The proteins will serve as a basis for more detailed discussions of biophysical topics. We will also consider the thermodynamics and kinetics of protein folding. The principles of polymer chain statistics and of helix-coil transitions in biopolymers will be reviewed. (F,SP) Staff

H190. Physics Honors Course. (2) Course may be repeated for credit. Must be taken on a pass/failed basis. A seminar which includes study and reports on current theoretical and experimental problems of interest to students. Open to all students. (F) Staff

H195A-H195B. 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 must, at the end of two semesters, submit a satisfactory thesis. A total of four units must be taken. The units may be distributed between one or two semesters in any way. (F,SP) Staff

196. Directed Group Study. (1-4) Must be taken on a pass/failed 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/failed basis. Enrollment restrictions apply; see the Introduction to Courses and Curricula section in this catalog. (F,SP) Staff

Graduate Courses

205A. Advanced Dynamics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 105, 110A-110B, or equivalent. An introduction to classical mechanics, Lagrangian and Hamiltonian dynamics, variational methods, symmetry, kinematics and dynamics of rotation, canonical variables and transformations, perturbation theory, non-linear dynamics. (F,SP) Staff

205B. Advanced Dynamics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 205A. Continuum systems, dissipative systems. Attractors. Emphasis on recent developments, including turbulence. (SP) Staff

208A. Introduction to Quantum Electronics and Nonlinear Optics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 208A or consent of instructor. Topics in nonlinear optics and quantum electronics, such as stimulated Raman and Brillouin scatterings, self-focusing, photon echoes, self-induced transparency, two-photon absorption, and high resolution spectroscopies, multi-photon processes. (SP) Staff

208B. Introduction to Quantum Electronics and Nonlinear Optics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 208A or consent of instructor. Topics in nonlinear optics and quantum electronics, such as stimulated Raman and Brillouin scatterings, self-focusing, photon echoes, self-induced transparency, two-photon absorption, and high resolution spectroscopies, multi-photon processes. (SP) Staff

210A. Classical Physics: Particle Dynamics, Electromagnetic Interaction, and Continuum Mechanics. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 105, 110A-110B, or equivalent. Coordinate transformations, tensors, scalar and vector fields, relativistic transformations and covariance of physical quantities and equations. Review of basic electricity and magnetism, potentials, gauge transformations, conservation of energy and momentum, the Lorentz invariance. Introduction to general relativity. See the Introduction to Courses and Curricula section in this catalog. (F,SP) Staff

210B. Classical Physics: Particle Dynamics, Electromagnetic Interaction, and Continuum Mechanics. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 105, 110A-110B, or consent of instructor. Coordinate transformations, tensors, scalar and vector fields, relativistic transformations and covariance of physical quantities and equations. Review of basic electricity and magnetism, potentials, gauge transformations, conservation of energy and momentum, the Lorentz invariance. Introduction to general relativity. See the Introduction to Courses and Curricula section in this catalog. (F,SP) Staff

*Professor of the Graduate School
**Recipient of Distinguished Teaching Award
fluid flow, plasmas, elasticity, eigenvalue problems, perturbations, initial value problems. (F) Staff

210B. Classical Physics: Electromagnetism. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 110A-110B, 210A, or consent of instructor. Electrostatics and magnetostatics. Green functions and potentials, two- and three-dimensional problems, use of orthogonal functions, conformal mapping, relaxation methods, multiple expansions of charge and current distributions, forces on multiple charges. Applications of theory to physical systems, vector spherical harmonics, examples of radiating systems, diffraction, optical theorem. Fields of charges in arbitrary motion, radiated power, relativistic (synchronous) radiation, collision in collisions. (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 or consent of instructor. Quantum theory of many-particle systems. Applications to physical systems. Pairing phenomena, superfluidity, equation of state, critical phenomena, phase transitions, nuclear matter. (SP) Staff

221A. Quantum Mechanics. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 137A-137B or equivalent. Basic assumptions of quantum mechanics; quantum theory of measurement; matrix mechanics; Schroedinger theory; symmetry and invariance principles; theory of angular momentum; stationary state problems; variational principles; time independent perturbation theory; time dependent perturbation theory; theory of scattering. (F) Staff

221B. Quantum Mechanics. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 221A-221B, or equivalent or consent of instructor. Introduction to group theory as applied to problems in modern physics. The particular field of physics will vary from one offering to the next. (SP) Staff

222. Special Topics in Mathematical Physics. (2-4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: 221A-221B or equivalent or consent of instructor. Introduction to group theory as applied to problems in modern physics. The particular field of physics will vary from one offering to the next. (SP) Staff

226. Particle Physics Phenomenology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 221A-221B or equivalent or consent of instructor. Introduction to particle physics phenomena. Emphasis on experimental test of predictions of standard physics models. Topics include: Quark model spectroscopy; Weak decays; Overview of detectors and accelerators; e+ annihilation; Parton model; ep and vp scattering; supersymmetry; current interest topics in particle physics. (SP) Staff

229A. Standard Model of Particle Physics I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 221A-221B or equivalent or consent of instructor; 226 (concurrent enrollment is recommended.). Introduction to quantum field theory; canonical quantization of scalar, electromagnetic, and Dirac fields; derivation of Feynman rules from a Lagrangian; regularizations; introduction to renormalization group. (F) Staff

229B. Standard Model of Particle Physics II. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 229A or equivalent or consent of instructor. Introduction to standard model and its applications; mathematical methods and exact results; solvable renormalization group analysis, non-abelian gauge theory. (SP) Staff

229C. Standard Model of Particle Physics III. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture and one hour of discussion per week. Prerequisites: 229B, 230A or equivalent or consent of instructor. Introduction to standard model and its applications: Higgs mechanism, construction of standard model, physics beyond standard model, cosmology and particle astrophysics. (F,SP) Staff

230A. Quantum Field Theory I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 229A or equivalent or consent of instructor. Functional integral methods; renormalization and renormalization group analysis, non-abelian gauge theory. (SP) Staff

230B. Quantum Field Theory II. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture and one hour of discussion per week. Prerequisites: 230A, 230A or equivalent or consent of instructor. Topics selected from nonperturbative methods such as instantons, solitons, the large-N expansion, and the strong-coupling expansion; modern mathematical methods and exact results; solvable models of quantum field theory; supersymmetry, supergravity, and superstring. (F) Staff

231. General Relativity. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 210B or equivalent, or consent of instructor. An introduction to Einstein’s theory of gravitation. Tensor analysis, general relativistic models for matter and electromagnetic fields. (SP) Staff

240A-240B. Quantum Theory of Solids. (4-4) Three hours of lecture and one hour of discussion per week. Prerequisites: 141A-141B and 221A-221B or equivalent, or consent of instructor; 240A is prerequisite to 240B. Phonons, magnons, plasmons, polarons, and electron field in solids and their interactions; superconductivity; many-body techniques; Green’s functions; Brillouin zones and symmetry; excitons; impurity states; transport processes; Fermi surfaces; neutron scattering; recoilless emission; theoretical methods in magnetic resonance. (F,SP) Staff

242A-242B. Theoretical Plasma Physics. (4-4) Three hours of lecture and one hour of discussion per week. Prerequisites: 142. Analysis of plasma behavior according to the Vlasov, Fokker-Planck equations, guiding center and hydromagnetic descriptions. Study of equilibria, stability, linear and nonlinear electro-magnetic waves, transport, and interaction with radiation. Rigorous kinetic theory. (SP) 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 semester to semester. See Department of Physics announcements. (F,SP) Staff

251. Introduction to Graduate Research in Physics. (1) One hour of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing, appointment as a teaching assistant, or consent of instructor. A survey of experimental and theoretical research in the Department of Physics, designed for first-year graduate students. One regular meeting each week with supplementary visits to experimental laboratories. Meetings include discussions with research staff. (F,SP) Staff

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

C285. Theoretical Astrophysics Seminar. (2) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. The study of theoretical astrophysics. Also listed as Astronomy C285. (F,SP)

C290A-290Z. Seminar. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis.

290C. Experimental Cosmology. (2) Seminar. In Seminar in Non-neural Plasmas. (2)

295. Special Study for Graduate Students. (1-4) Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. (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: For qualified graduate students. 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. Professional Preparation: Supervised Teaching of Physics. (2) Course may be repeated for credit. One hour of meeting with instructor plus fifteen to twenty hours of teaching per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing, appointment as a teaching assistant, or consent of instructor. Discussion, problem review and development, guidance of physics laboratory experiments, course development, supervised practice teaching. (F,SP) Staff
Department Office: 111 Koshland Hall, (510) 642-9999
Student Affairs Office: 111 Koshland Hall, (510) 642-5167
Computers and Information Systems: Jackson, Ph.D.
Division Chair, Plant Biology: Lewis J. Feldman, Ph.D.
Division Chair, Microbial Biology: Steven E. Lindow, Ph.D.

Professors
Bob B. Buchanan, Ph.D. Duke University. Plant microbial biochemistry.
Lewis J. Feldman, Ph.D. Harvard University. Plant physiology/development.
Robert Fischer, Ph.D. University of California, Berkeley. Plant molecular biology.
Michael Freeing, Ph.D. University of Indiana. Plant development and gene regulation.
N. Louise Glass, Ph.D. University of California, Davis. Fungal genetics.
Andrew Jackson, Ph.D. University of Manitoba, Canada. Plant virology.
Russell L. Jones, Ph.D. University of Wales. Plant biochemistry.
Donald H. Kaplan, Ph.D. University of California, Berkeley. Developmental biology of vascular plants.
Sydney Kustu, Ph.D. University of California, Davis. Regulation of cellular metabolism.
Steven E. Lindow, Ph.D. University of Wisconsin. Bacterial ecology, physiology of vascular plants.
Anastasios M.E. Protopapas, Ph.D. Dosta State University. Plant molecular responses to the environment.
Peter H. Priest, Ph.D. University of Sydney. Plant molecular biology.
Bren J. Skaeckiewicz, Ph.D. University of California, Berkeley. Molecular genetics.
Zinmay Renee Sung, Ph.D. University of California, Berkeley. Plant somatic cell genetics.

Associate Professors
John W. Taylor, Ph.D. University of California, Davis. Mycology.
Norman Terry, Ph.D. Nottingham University. Environmental plant physiology.
Lov Volkan, Ph.D. University of Washington. Insect physiology.
Patricia C. Zambrisky, Ph.D. University of Colorado. Plant molecular biology.
Watson M. Laetsch (Emeritus), Ph.D. Stanford University. Experimental morphology.
Loy Volkman, Ph.D. University of California. Plant physiology.

Adjunct Professors
Thomas D. Bruns, Ph.D. University of Michigan. Fungal molecular evolution.
N. Louise Glass, Ph.D. University of California, Davis. Fungal genetics.
Sheng Luan, Ph.D. Harvard University. Plant cell biology.

Assistant Professors
Anne Holtzheiter, Ph.D. Philips University. Microbial physiology.

Adjunct Associate Professors
Barbara Baker, Ph.D. University of California, San Francisco. Genetics and disease resistance.
Mark Ow, Ph.D. Harvard University. Plant and viral gene expression.

Adjunct Assistant Professors
Jennifer Fletcher, Ph.D. University of Utah. Plant developmental biology.

Graduate Advisors: Mr. Luan, Ms. Sung, Mr. Terry, Ms. Zambrisky.

Undergraduate Advisers: Mr. Bruns (Chair), Ms. Baker, Mr. Feldman, Mr. Jones, Ms. Zambrisky.

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 defining their own areas of interest. In addition to departmental resources that are available in Koshland Hall, students of the College of Natural Resources Biological Imaging Facility and the United States Department of Agriculture Plant Gene Expression Center are available for the programs of the department.

The Division of Plant Biology. The 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 the environment, and the impact of human activities on the plant biosphere are many of the challenges that will continue to fuel the expansion of plant biology research well into the 21st century.

The Division of Microbial Biology. The Division of Microbial Biology was established recently within the department to provide a focus for microbial biology at Berkeley. There is a growing awareness that microbes and microbial activities are essential to maintaining a high quality of life for all eukaryotes. Moreover, understanding the microbial world is necessary if we are to comprehend the global ecosystem, evolutionary history, and diversity 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 department’s 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 provide a foundation in both biological and physical sciences as preparation for advanced study at the upper division level. Two distinct tracks focus on the molecular and genetic aspects (Plant Genetics, Track I) and on the cellular and organismal aspects (Plant Biology, Track II) of plants.

Most of the departmental 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 are provided in the form of Honors Research (PB H196) or Supervised Independent Study and Research (PB 99 or PB 199).


Requirements
Humanities and Social Science (20-24 units). Reading and Composition (8); Humanities (two courses, 6-8; language recommended for pre-med); *Social Science (two courses, 6-8).
*Units may be credited toward American cultures requirement.
Lower Division Science and Mathematics (34-37 units). Chemistry 1A (4); Chemistry 3A (5) and 3B (4) [Organic]; Physics 8A (4); Math 16A (3) and 16B (3) or 1A and 1B (8); General Biology 1A and 1B (8); Statistics 20 (4), 25 (4), PH 142A (4), Stat 131A (4) or Geol C120 (3).
Upper Division Science (8 units). One course from category (a) and (b):
(a) Biochemistry and Molecular Biology: MCB 102, Biochemistry and Molecular Biology (4); MCB 110, Molecular and Cell Biology (4); MCB 111, General Biochemistry (4)
(b) General Genetics. MCB 140, General Genetics (4); MCB 142. Survey of General Genetics (4).
Microbial Core (7 units). All listed courses are required: PMB C112, General Microbiology (3); PMB C112L, General Microbiology Lab (1); PMB 118, Microbial Genomics and Genetics (3).
Upper Division Science Electives. Take 15-16 courses from the following, including a course with a lab or a lab course:
Microbial Diversity and Ecology: PMB 110, Biology of Fungi (2); PMB 110L, Fungi Lab (2); PMB 120, Biology of Algae (2); PMB 120L, Algae Lab (2); PMB C116, Microbial Diversity (3); ESPM 112, Microbial Ecology (3) (lab included); ESPM 131, Soil Microbiology (2).
Host-Microbe Interactions: PH 162A, Public Health Microbiology (3); PH 162L, Public Health Microbiology Lab (1); PMB C103, Bacterial Pathogenesis (3); PMB C114, Intro to Comparative Virology (4); MCB 115, Molecular Biology of Animal Viruses (3).
Chemistry, Biochemistry, Structure: *Chem 130A, Biophysical Chemistry (3); *MCB 100, General Biochemistry (4); MCB 111, Intro to Structural Biology (3).
*Prerequisites for MCB 110.
Applied Microbiology: Nut 113, Food Microbiology (2); ESPM 192, Molecular Approaches to Environmental Problem Solving (2); CE 114, Environmental Microbiology (3); MCB 113, Applied Microbiology and Biochemistry (2).

General Electives. Take 34-35 units of additional electives to complete 120 units.

Graduate Program in Plant Biology

The graduate program in plant biology is designed to train students in modern research areas of plant biology. Study and research are designed individually, in light of their interests and career goals. The graduate program features an introductory seminar (Faculty Research Review), a two-semester enrichment and isolation of bacteria and archaea from the environment, and effects of human industrial and agricultural activity on plant ecosystems. Knowledge of the physical sciences is neither required nor assumed. (F) Staskawicz

Biology 11. Introduction to the Science of Living Organisms. (4) Students will receive no credit for 11 after receiving credit for both Integrative Biology 15 and 30. Three hours of lecture and three hours of laboratory per week. Prerequisites: For students not majoring in biological science and for non-science majors. Principles of biological organization and function using examples from plant and animal kingdoms. Similar in scope to Biology 1, this course is motivated by the integrative sciences is neither required nor assumed. Sponsored by Plant and Microbial Biology. (SP) Staff

20. Topics in Plant Biology. (1) Two hours of discussion per week. Must be taken on a passed/not passed basis. Preferentially open to freshmen and sophomores specializing in Plant Biology faculty on current research and topics in plant biology. Plant genetics, plant development, plant pathology, agricultural biotechnology and genetic engineering will be discussed. Ideal for students who are considering a major in the Department of Plant and Microbial Biology.

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 grow, reproduce, and perform checks (e.g., to light) in ways distinct from animals. Prepares students to read and think critically in the areas of faculty specialties. The department has research expertise in the following areas: molecular, cellular, genetic, bio-chemical, physiological, developmental, and structural biology, and plant-microbe interactions. The core course emphasizes an integrated manner the following areas: plant structure, plant physiology, plant biochemistry, plant development, plant cell biology, and plant molecular biology. Prospective students for the graduate program in plant biology are expected to demonstrate academic excellence and potential for independent scientific research. Students are expected to have a basic background in biology, physics, mathematics, and basic biology, and 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 academic and professional goals, and other evidence. Applicants will be notified in writing of the decision. Scores on standardized tests, such as the Graduate Record Examination, 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 Microbial Biology

The Department of Plant and Microbial Biology administers the Graduate Group in Microbiology which awards the Ph.D. degree in Microbiology at UC Berkeley. A Graduate Group is an interdepartmental group of faculty who offer a program in an area which crosses departmental boundaries. The Graduate Group in Microbiology is composed of 41 faculty from diverse departments. The graduate program features an introductory seminar (Faculty Research Review), a one-semester core course and additional special topics courses and seminars in area of faculty specialties. The core course, Critical Thinking in Microbiology, addresses the following areas: 1) Biochemistry, Physiology and Development, 2) Genetics and Genomics, 3) Population Biology and Evolution, 4) Ecology and Pathogenesis. For more information on the Graduate Group in Microbiology, see the full description under “Microbiology,” in this General Catalog.

Lower Division Courses

10. Plants, Agriculture, and Society. (2) Two hours of lecture per week. Changes patterns of agriculture in relation to population growth, the biology and social impact of crop engineering, and the ecological consequences of a thousand years of crop improvement and modern biotechnology, interactions between plants and the environment, and effects of human industrial and agri-cultural activity on plant ecosystems. Knowledge of the physical sciences is neither required nor assumed. (F) Staskawicz

Biology 11. Introduction to the Science of Living Organisms. (4) Students will receive no credit for 11 after receiving credit for both Integrative Biology 15 and 30. Three hours of lecture and three hours of laboratory per week. Prerequisites: For students not majoring in biological science and for non-science majors. Principles of biological organization and function using examples from plant and animal kingdoms. Similar in scope to Biology 1, this course is motivated by the integrative sciences is neither required nor assumed. Sponsored by Plant and Microbial Biology. (SP) Staff

20. Topics in Plant Biology. (1) Two hours of discussion per week. Must be taken on a passed/not passed basis. Preferentially open to freshmen and sophomores specializing in Plant Biology faculty on current research and topics in plant biology. Plant genetics, plant development, plant pathology, agricultural biotechnology and genetic engineering will be discussed. Ideal for students who are considering a major in the Department of Plant and Microbial Biology.

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 grow, reproduce, and perform checks (e.g., to light) in ways distinct from animals. Prepares students to read and think critically in the areas of faculty specialties. The department has research expertise in the following areas: molecular, cellular, genetic, bio-chemical, physiological, developmental, and structural biology, and plant-microbe interactions. The core course emphasizes an integrated manner the following areas: plant structure, plant physiology, plant biochemistry, plant development, plant cell biology, and plant molecular biology. Prospective students for the graduate program in plant biology are expected to demonstrate academic excellence and potential for independent scientific research. Students are expected to have a basic background in biology, physics, mathematics, and basic biology, and 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 academic and professional goals, and other evidence. Applicants will be notified in writing of the decision. Scores on standardized tests, such as the Graduate Record Examination, 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.

C101. Bacterial Pathogenesis. (3) Two hours of lecture per week. Prerequisites: Molecular and Cell Biology 1A-1B. must be taken concurrently with 107L. Formerly 100. An analysis of the structural diversity of multi-cellular plants, especially the higher forms, with emphasis on the 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 Integrative Biology 107L. (F) Ka- plan

C107L. Laboratory for Principles of Plant Morphology. (2) Six hours of laboratory per week. Prerequisites: Biology 1A-1B; must be taken concurrently with 107L. Formerly 100L. Laboratory designed to accompany C107, Principles of Plant Morphology. Also listed as Integrative Biology C107L. (F) Kaplan

110. Biology of Fungi. (2) Two hours of lecture per week. Prerequisites: Biology 1A-1B; Integrative Biology 101 recommended. Must be taken concurrently with 110L. Laboratory designed to accompany 110, Biology of Fungi. Several field trips are offered including day trips to a mushroom farm, a winery and a cheese factory, and a weekend mushroom foray. (S) Taylor

C110L. Laboratory for Biology of Fungi. (2) Six hours of laboratory per week. Prerequisites: Biology 1A-1B; Integrative Biology 101 recommended. Must be taken concurrently with 110L. Laboratory designed to accompany 110, Biology of Fungi. Several field trips are offered including day trips to a mushroom farm, a winery and a cheese factory, and a weekend mushroom foray. (S) Taylor

C112. General Microbiology. (3) Three hours of lecture per week. Prerequisites: Molecular Cell Biology 100 or 102. Formerly 110. This course will explore 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 this diversity will be discussed. Molecular, genetic, and structure function analyses of microbial behaviors, cycles, adaptive capabilities, and macro-molecular syntheses will be emphasized. Also listed as Molecular and Cell Biology C112. (F) Holmester

C112L. General Microbiology Laboratory. (1) One hour of laboratory per week. Prerequisites: C112 (may be taken concurrently). Experimental techniques of microorganisms designed to accompany the lecture in C112. The primary emphasis in the laboratory will be on the observation, cultivation, and characterization of bacteria and archaea. Laboratory exercises will include the enrichment and isolation of bacteria and archaea from various environments. Also listed as Molecular and Cell Biology C112L. (F) Holmester

C114. Introduction to Comparative Virology. (4) Two hours of lecture per week. Prerequisites: General Microbiology 1A or 3A-3B or equivalent and introductory biology (1A or 1B or equivalent) and general microbiology (100 or equivalent)—previously completed but not required. Must be taken concurrently with C114L. Formerly considered as infectious agents of bacteria, plants, and animals (vertebrates and invertebrates). Several families of viruses will be compared with respect to biochemical, structural and morphological properties, and strategies of infection and replication. Also listed as Environ Sci. Policy, and Management C138 and Molecular and Cell Biology C114L. (SP) Volkman, Jackson

118. Microbial Genomics and Genetics. (3) Three hours of lecture per week. Prerequisites: Molecular and Cell Biology 100 or 102. Course emphasizes bacterial and archaeal genetics and comparative genomics. Genetics and genomic methods used to dissect metabolic and developmental processes in bacteria, archaea, and selected microbial eukaryotes. Genetic mecha-
nisms integrated with genomic information to address integration and diversity of microbial processes. Introduction to the use of computational tools for a comparative analysis of microbial genomes and determining bacterial, archaeal, and microbial eukaryotes. (SP) Brenner, Glass

120. Biology of Algæ. (2) Two hours of lecture per week. Prerequisites: Biology 1A-1B; Integrative Biology 101 recommended. Must be taken concurrently with 120L. General biology of freshwater and marine algae including both phytoplankton and benthos. Emphasis is on morphology, phylogeny and systematics. (SP) Staff

120L. Laboratory for Biology of Algæ. (2) Four hours of laboratory per week plus field trips. Prerequisites: Biology 1A-1B. (Integrated Biology 101 recommended. Must be taken concurrently with 120.) Laboratory designed to accompany 120, Biology of Algæ. Laboratories include study of representative types, identification of field-collected specimens, techniques for culture, simple experiments on development and reproduction, and economic uses of algae. (SP) Staff

135. Physiology and Biochemistry of Plants. (3) Three hours of lecture per week. Prerequisites: Biology 1A-1B. A study of physiological and biochemical processes in higher plants, including water relations, ion transport, and hormone physiology; photosynthesis (light utilization and carbon assimilation), nitrogen and sulfur metabolism, and plant-specific biosynthetic pathways. (F) Melis, Terry

135L. Laboratory for Physiology and Biochemistry of Plants. (1) Three hours of laboratory with discussion per week. Prerequisites: Biology 1A-1B; must be taken concurrently with 135. Laboratory designed to accompany 135. Physiology and Biochemistry of Plants. (F) Melis

150. Cellular and Developmental Plant Biology. (3) Three hours of lecture per week. Prerequisites: Biology 1A-1B. An introduction to the structural, molecular and cellular aspects of plant development. The use of genetic mutants in studying rules and principles of growth and differentiation; control of plant shape, division and development; shoot, root, leaf and floral morphogenesis from plant meristems. (F) Sung, Luan

150L. Laboratory for Cellular and Developmental Plant Biology. (1) Three hours of laboratory discussion per week. Prerequisites: Biology 1A-1B. Must be taken concurrently with 150. Laboratory designed to accompany 150, Cellular and Developmental Plant Biology. (SP) Hake

160. Plant Molecular Genetics. (3) Three hours of lecture per week. Prerequisites: Biology 1A-1B. A consideration of plant genetics and molecular biology. Principles of nuclear and organelle genome structure and function. How DNA is expressed as protein. Genes in response to environmental and developmental stimuli; clonal analysis; investigation of the molecular and genetic bases for the exceptional cellular and development strategies adopted by plants. (SP) Fischer, Hake

160L. Laboratory for Plant Molecular Genetics. (1) Three hours of lecture/discussion per week. Prerequisites: Biology 1A-1B. Must be taken concurrently with 160. Laboratory designed to accompany 160, Plant Molecular Genetics. (SP) Hake

170. Modern Applications of Plant Biotechnology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B. This course is designed to introduce students to the principles and applications of modern plant biotechnology. Basic concepts of modern agriculture will be reviewed in light of emerging biotechnology applications. Emphasis will be placed on understanding the tools and strategies involved in optimizing plant productivity. (SP) Staksowski, Jackson

180. Environmental Plant Biology. (3) Three hours of lecture 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 microenvironment that affect plant function; and molecular, cellular and developmental aspects of plant response to suboptimal/adverse conditions. Underlying biochemistry, physiology and molecular biology of plant adaptation to the changing environment. Examination of consequences of industrial activity on plant growth and productivity. (SP) Melis, Terry

H196. Honors Research. (1-4) Course may be repeated for credit. Prerequisites: Enrollment in departmental honors program; Overall GPA of 3.20 or better; consent of instructor. Individual laboratory research for honors students. Assessed by a written report and an oral presentation under the supervision of a faculty member. (F,SP) Staff

198. Directed Group Studies in Plant Biology. (1-3) Course may be repeated for credit. One hour of discussion per unit per week. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor; overall GPA of 3.0. Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalog. (F,SP) Staff

Graduate Courses

201. Faculty Research Review. (2) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Consent of instructor. Presentation and discussion of faculty research 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 stimulate a dialogue between instructor and student in the course of each presentation. (F) Staff

220. Critical Thinking in Microbiology. (3) One and one-half hours of lecture and one-and-one-half hours of discussion per week. Prerequisites: C112 or equivalent (may be taken concurrently). An overview of microbial evolution (including phylogenetics and population genetics), biochemistry, physiology and development, host parasite interactions, and ecology will be provided, emphasizing new research directions and involving students in discussions of primary literature, Conceptual issues and/or research approaches and technologies that will provide a broad perspective of microbiology will be discussed. Readings and discussions of recent primary literature will enable students to develop skills in critical analysis of literature. (SP) Lindow

C246. Topics in Genomics and Computational Biology. (2) Four hours of lecture, paper review, and discussion per week. Prerequisites: Consent of instructor. Instruction and discussion of current topics in genomics and computational biology. The course will provide background information about computational biology and genomics methodologies. This will be followed by critical discussion of recent research results in these fields. Also listed as Molecualr and Cell Biology C246. (SP) Brenner, Eisen

290. 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. Advanced study in various fields of plant biology. Offered in advance of availability of advanced seminars in each semester. Enrollment in more than one section permitted. (F,SP) Staff

297. Grant Writing and Research Presentations. (2) Two hours of lecture per week. Each student will write a grant proposal in three phases; 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 other grant proposals. The scheduled class 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 reviewers. (SP) McCormick

298. Plant Biology Group Studies. (1-6) Course may be repeated for credit. One hour of lecture/disussion per week. Sections 1-2 to be offered on a satisfactory/unsatisfactory basis. Section 3 to be offered on a letter-grade basis. Other sections will be offered at the discretion of the instructor. Prerequisites: Consent of instructor. Advanced research topics which will vary semester to semester. Enrollment in more than one section permitted. (F,SP) Staff

299. Graduate Research. (1-12) Course may be repeated for credit. Three hours of research/laboratory per week per unit. Prerequisites: Graduate standing. Graduate student research. (F,SP) Staff

602. Individual Study for Graduate Students. (1-8) Course may be repeated for credit. Does not satisfy unit or residence requirements for doctoral degree. One 1-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate student status. Designed for all graduate students. This course has two goals: discussion of questions and problems relating to the GSI’s teaching, and 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 teaching seminars, visit faculty lectures, course design, lecturing preparation, sample lecture presentation, and discussion of current literature on teaching. (SP) Staff

Program in Political Economy

300. Workshop on Teaching. (2) Course may be repeated for a maximum of 4 units. Two hours of lecture or discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate student status. Designed for all graduate students. This course has two goals: discussion of questions and problems relating to the GSI’s teaching, and 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 teaching seminars, visit faculty lectures, course design, lecture preparation, sample lecture presentation, and discussion of current literature on teaching. (SP) Staff

Political Economy of Industrial Societies

(Interior and Area Studies) 101 Stephens Hall, (510) 642-4466

Faculty Advisers
Richard M. Abrams (History)
Vinod Agarwala (Political Science)
Richard M. Buxbaum (Law)
Stephen Cohen (City and Regional Planning)
Dwight Crawford (Integrative and Area Studies)
Robert Drinan (Graduate Program in Religious Studies)
James Drescher (International and Area Studies)
Richard Flath (International and Area Studies)
Michael Gerlach (Business Administration)
Andrew Janos (Political Science)
Robert Kagan (Political Science)
Carmen Karras (International and Area Studies)
Jonathan Leonard (Business Administration)
Andrew MacIntosh (History)
Robert Reed (Geography)
Genei L. Rochlin (Energy and Resources Group)
Stephen Vogel (Political Science)
Steven Weber (Political Science)
John Zysman (Political Science)

Program in Political Economy

The Program in Political Economy of Industrial Societies introduces students to issues relevant to the political and economic institutions of modern societies, focusing on problems of both domestic and international policy. It offers a program of study for students with a broadly based liberal arts background while providing them with intellectual skills applicable to careers in either the public or private sector. Additionally, the major provides an excellent background for students planning postgraduate careers in social science disciplines and professional schools. Political economy covers the interaction between politics and economics in modern industrial societies. It is assumed that society, culture, geography, and demographics affect that interaction and are therefore critical contributors to an understanding of the subject. Therefore, any study of political economy must be both multi-and interdisciplinary in scope.

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Although the major has a strong historical component, contemporary problems form the central focus. Students in the major emphasize planning and problem solving; environmental issues; resource use and distribution; and the challenges of institutional innovation, value innovation, and changing political equilibriums.

Some of the questions which the major addresses include:
(a) the tension between rising consumer demand versus the need to minimize resource depletion and pollution;
(b) the different priorities served by traditionalist, capitalist, and socialist varieties of political economy;
(c) the different priorities served by democratic and authoritarian political systems;
(d) how international interdependence may undermine the efforts of national governments to cope with unemployment, inflation, trade and payment deficits, health, housing, and welfare problems, and other issues associated with industrialized societies;
(e) the importance of organizational structures for policy-making in both the public and private sectors.

The Group Major

Declaring a major in PEIS follows guidelines established by the College of Letters and Science. Students wishing to declare PEIS:
(1) must have completed at least 30 semester units of university work before applying to the program;
(2) must have completed at least two of the required lower division courses or their equivalents and be enrolled in a third;
(3) must have a minimum GPA of 3.2 in courses relevant to the major, including the required lower division courses;
(4) must have completed at least two semesters of college-level foreign language or the equivalent;
(5) should declare the major no later than the fourth semester in which they complete the 61st unit (junior transfer students should contact the Teaching Program Office concerning their eligibility).

Students who meet the above criteria are eligible for admission to the major. Students who do not meet the above criteria but wish to declare PEIS may submit a letter of appeal along with a completed application. Appeal cases are reviewed at the end of the sixth and twelfth weeks of each semester. Applications and instructions regarding the application and appeal processes may be obtained from the Teaching Program Office, 101 Stephens Hall.

Students are reminded that: (1) no course work for the major may be taken on a passed/not passed basis, and (2) no course may be used to satisfy more than one requirement.

Double Majors. Double majors must be approved by the dean of the College of Letters and Science and cannot use more than two upper division courses 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 course work taken at institutions outside the United States to fulfill major requirements is restricted to the equivalent of three semester-length upper division courses. However, courses taken to fulfill the foreign language requirement for the group major are not included in this restriction.

Honors Program. To graduate with honors from the group major in PEIS, students must enroll in the two-semester honors seminar, IAS 102 and PEIS H195, and must obtain grade-point averages of 3.5 in the major and in overall university course work. The honors seminar is taken in addition to a student's regular course work for fulfilling requirements for the major and culminates in the writing of a senior thesis. The thesis is read by the thesis 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 may be checked in the Teaching Program Office.

Course Plan

There is considerable flexibility within the PEIS major. It permits and encourages students to construct programs tailored to their intellectual interests and the global areas they wish to stress in their studies. There are, however, minimal core course requirements that each student must meet. These requirements are intended to provide all PEIS students with a common background of knowledge and common intellectual reference points.

The program consists of three tiers of course work and a foreign language requirement: (1) lower division courses provide necessary historical, political, quantitative, and statistical skills essential for upper division course work and for future career and educational options; (2) six upper division core courses provide detailed background for studying modern political economies; and (3) four courses provide in-depth study in the student's chosen issue or problem emphasis.

In addition to the requirements outlined above, all PEIS majors must demonstrate proficiency in a single 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 PEIS, depending on their background and ability. (1) Through course work: This could consist of any combination of high school, college, summer program, or college-level study abroad program. 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 Pass/No Pass basis; the fourth semester must be taken for a letter grade. Language courses must not be taken at Berkeley. Courses taken at a community college or any accredited school or university are acceptable. Transcripts must be submitted. 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. Ask an adviser in the IAS Office about specific departmental policies. Another option is to have a language department place you in a class according to your skill level. Anyone who can place into advanced course work, that is, beyond the fourth semester, and obtain an instructor's note to that effect will be exempted from the requirement.

(3) Being a non-native English speaker: Non-native speakers of English may use their native language to satisfy this requirement. You must demonstrate a proficiency level equivalent to four college-level semesters through proficiency testing (see paper below). Applicants must show that they can document that they were educated in their native countries in their native language at least through high school, or the equivalent of high school, will be exempted from the requirement.

Lower Division

There are four 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 a faculty adviser, satisfactorily completing an upper division equivalent. Please consult with the Teaching Program Office for current information.

Required Courses.

Economics 1, IAS 45, Political Science 2, Statistics 2 or 20 or 21.

Upper Division

There are 10 required upper division courses spread among four major divisions. These include three courses in conceptual tools; two courses in introductory sequence: political economy; and four courses focusing on a student's emphasis in the major.

Note: In fulfilling the upper division major requirements, students should keep in mind that no more than two courses outside of the College of Letters and Science may be used in their major programs and no course used to complete major requirements may be taken P/NP.

I. Conceptual Tools

Section A: two courses in intermediate economics. Choose one of the following sequences: Economics 100A-100B or Economics 101A-101B.

Section B: one course in modern theory and methodology: PEIS 101.

II. Introductory Sequence: Historical Context

Section A: one course in classical works: PEIS 100.

Section B: one course in the rise of the industrial state: Economics 115; History 159B, 160, 161.

III. Introductory Sequence: Political Economy

One course: Business Administration 170; City and Regional Planning 112A; Economics 161; Political Science 120A, 121A, 121B, 126A, 126B, 138E.

IV. Major Emphasis

Four courses.

The emphasis is the heart of the major, the topic or theme within the area of political economy that students choose and define. This part of the program is meant to give students the opportunity to deepen their understanding of the nature of the relationship between politics and economics as it relates to a particular issue. The emphasis must be a somewhat narrowly based issue in political economy. Students are encouraged to be imaginative in defining an emphasis and to discuss their ideas with a faculty or staff adviser before selecting their courses. All emphasis courses must be approved by a staff adviser.

In choosing Emphasis courses, students should be mindful of two things: (1) Students must select from a number of different disciplines. This ensures the fullest possible understanding of the Emphasis topic. (2) In addition to the interdisciplinary view, students are required to take courses that differ in approach. For this purpose, all of the courses in the PEIS booklet have been evaluated and categorized according to approach. These categories are not emphasis topics themselves. Each category is described in the booklet. At least two courses must come from one category, the remaining two may be selected from any of the remaining three categories. The lists provided are not exhaustive, special courses are often announced each semester. Students should be flexible in their scheduling in order to take advantage of last minute additions.

Both defining your Emphasis topic and deciding on the relevant course work must be done in conjunction with a PEIS faculty or staff adviser. The Emphasis is meant to give students the opportunity to deepen their understanding of the nature of the relationship between politics and economics as it relates to a particular issue. Remember that all Emphasis courses, which must relate to the Emphasis topic, must be pre-approved by a PEIS adviser.
The PEIS booklet is available at the Teaching Program Office. Although every attempt is made to publish an accurate list of acceptable course work, the lists may not be entirely comprehensive.

Note: No more than two of the four course needs to fulfill the emphasis course work requirement may be from the same department.

Recommended Courses
Listed below are a few of the many course options which PEIS majors have found particularly relevant and helpful in providing a basic introduction for methodology and other upper division courses:
History 7B, Mathematics 1A-1B.  *Demography 100.

*Note: Math 16A-16B or the self-paced equivalents to either sequence are acceptable alternatives. However, it is strongly recommended that Math 1A-1B be taken over the alternatives. If a self-paced version is chosen, students are reminded to schedule their units conservatively and clearly understand how self-paced scheduling works.

Minor in European Studies
The minor in European studies is open to all undergraduates except PEIS majors. Applications for the minor and a list of appropriate courses are available from the Teaching Program Office.

Requirements: Students must complete six upper division courses, including PEIS 100 and 101. The remaining five courses must be completed in two of three specified fields: politics, business/economics, and culture and society and 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 satisfying minor requirements must be taken for a letter grade; and (3) a minimum GPA of 2.0 must be achieved in all upper division courses work to satisfy the minor requirements.

Upper Division Courses

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, Malthus, Ricardo, and Menger. Strong emphasis is placed on providing appropriate background for understanding the evolution of the literature that has emanated from the various social sciences disciplines which form the basis of modern political economy. (F,SP)

H195. Senior Honors Thesis Seminar. (4) Two hours of seminar per week. Prerequisites: International and Area Studies 102 and consent of instructor; senior standing. Formerly H195A-H195B. Honors seniors are 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 and a second reader to be selected based on the thesis proposal. Students may apply for honors credit. (F,SP) Staff

196W. Special Field Research. (1-6) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. Four-credit courses will count as half-semester internship courses; six-credit courses will count as one-half-semester internship courses. Survey of research techniques in selected fields of political economy and industrialization. Seminars will focus on specific geographical areas or topics with appropriate comparative material included. A major research project is required as well as class presentations. Topics change each semester. (F,SP) Staff

197. Field Studies. (1-5) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. A short course designed for students to take advantage of short-term visitors coming to campus who have considerable expertise in areas of interest to political economy of industrial societies. Topics will vary from semester to semester. (F,SP) Staff

150. Advanced Study in Political Economy of Industrial Societies. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor and background in political economy of related social sciences. Advanced multi-disciplinary research seminars on topics of political economy and industrialization. Seated on political economy and industrialization. Seminars will focus on specific geographical areas or topics with appropriate comparative material included. A major research project is required as well as class presentations. Topics change each semester. (F,SP) Staff

192. Senior Thesis. (3) Individual weekly meetings. Prerequisites: Upper division standing; 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 thirty pages in length; the topic should be agreed upon in advance by both the student and faculty sponsor. (F,SP) Staff

195. Senior Honors Thesis. (3) Two hours of seminar per week. Prerequisites: International and Area Studies 102 and consent of instructor; senior standing. Formerly H195A-H195B. Honors seniors are 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 and a second reader to be selected based on the thesis proposal. Students may apply for honors credit. (F,SP) Staff

Senior Honors Thesis Seminar. (4) Two hours of seminar per week. Prerequisites: International and Area Studies 102 and consent of instructor; senior standing. Formerly H195A-H195B. Honors seniors are 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 and a second reader to be selected based on the thesis proposal. Students may apply for honors credit. (F,SP) Staff

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 who have completed 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 produce a final paper for the course consisting of no fewer than 35 pages. Other restrictions apply; see faculty adviser. (F,SP) Staff

196W. Special Field Research. (10) Course may be repeated for credit. Twenty hours of seminar per week. Prerequisites: Consent of instructor; formerly 196W. 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 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 produce a final paper for the course consisting of no fewer than 35 pages. Other restrictions apply; see faculty adviser. (F,SP) Staff

Political Science / 379
Political Science (College of Letters and Science)
Department Office: 210 Barrows Hall, (510) 642-6232 http://www.polisci.berkeley.edu

Professors
Vinod K. Aggarwala, Ph.D. Stanford University. International relations, political economy
Henry E. Brady, Ph.D. Massachusetts Institute of Technology. Quantitative methodology, American and international politics
George W. Breslauer, Ph.D. University of Michigan. Soviet and Eastern European politics
Wendy Brown, Ph.D. Princeton University. Contemporary political theory, feminist political thought
Bruce E. Cain, Ph.D. Harvard University. California politics, state and local politics, American politics
Jacobian, Ph.D. University of California, Berkeley. Political behavior, comparative government
David Collier, Ph.D. University of Chicago. Comparative politics, Latin America, methodology
Ruth B. Collier, Ph.D. University of Chicago. Comparative politics
Giuseppe DiPalma, Ph.D. University of California, Berkeley. Comparative politics
W. Lowell Dittmer, Ph.D. University of Chicago, China
BARRY Eichengreen, Ph.D. Yale University. Economic history
Andrew C. Johns, Ph.D. Princeton University. Comparative government, Eastern European politics
Christopher T. Jowitt, Ph.D. University of California, Berkeley. Social theory, comparative analysis
Robert A. Kagan, Ph.D. Yale University. J.D. Columbia University. Public law, government regulation
Tod R. LaPorte, Ph.D. Stanford University. Public administration, development, Africa
Hong Yung Lee, Ph.D. University of Chicago, China, Korea, East Asia international relations and political economy
David Leonard, Ph.D. University of California, Berkeley. Public administration, development, Africa
Kevin O’Brien, Ph.D. Yale University. Comparative politics, Chinese, social movements, public policy
Wilson Polisy, Ph.D. Yale University. American politics, comparative politics, political behavior, international organization
Shannon C. Stimson, Ph.D. Harvard University. Political theory
D. Paul Thomas, Ph.D. Harvard University. Political theory, Marxist theory
David Vogel, Ph.D. Princeton University. Government, political behavior, comparative government
Michael P. Rogin, Ph.D., University of Chicago. American politics, American and European political theory
David Collier, Ph.D. University of Chicago. Comparative government, public administration, comparative policy
Norman Jacobson (Emeritus), Ph.D. University of Wisconsin. Social theory, comparative analysis
Maurice Duverger, Ph.D. University of Paris. Comparative government, legislative behavior
Martin Landau (Emeritus), Ph.D. New York University. France, comparative government, public policy
Hans P. Kohn (Emeritus), Ph.D. University of California, Berkeley. Political theory
A. Robert Austin (Emeritus), Ph.D. University of California, Berkeley. American government, communications, electoral behavior, political parties
Robert A. Scalapino (Emeritus), Ph.D. Harvard University. Comparative politics, East Asia
Kenneth N. Waltz (Emeritus), Ph.D. Columbia University. International politics and military policy

Written proposal must be approved by a faculty adviser. Enrollment restricted by regulations of the college. (F,SP) Staff

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
 Interested students should consult the undergraduate adviser for more information and an application. Further Information. For specific information on field or area concentrations in political science, consult faculty members.

Graduate Program
Information about admission to the graduate program may be obtained from the departmental graduate office, 210B Barrows Hall.

Lower Division Courses
1. Introduction to American Politics. (4) Three hours of lecture and one or two hours of discussion per week. An introductory analysis of the structure and operations of the American political system, primarily at the national level. (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) Staff
4. Introduction to Political Theory. (4) Three hours of lecture and one or two hours of discussion per week. An approach to the understanding of politics through the perspectives and language of the political theorist. (S,SP)

Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-6 to be graded on a passed/not passed basis. Sections 7-8 to be graded on a letter-graded basis. The Berkeley 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. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester.

40. Introduction to the Pacific Rim. (4) Three hours of lecture and one hour of discussion per week. This course will provide lower division students with a general survey and analysis of geographic and cultural development in the Asian Pacific Region. Ditmier
41. Freshman Seminar. (4) Course may be repeated for credit with consent of department. Three hours of seminar per week. Topics, experimental in nature, will vary from year to year. (F,SP) Staff

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.

Group Study of Selected Topics. (1) One hour of lecture per week. Must be taken on a passed/not passed basis. Prerequisites: Completion of two Political Science courses and a 3.3 GPA. Supervised Independent Study and Research for lower division students, pursuant to the Regulations of the Berkeley Division, Section A230.

Upper Division Courses
American Politics
100. The Development of American Political Institutions. (4) Three hours of lecture and two hours of discussion per week. This advanced undergraduate course examines the development of American political institutions. Focus is on developments in the party system, Congress, and the bureaucracy. The emergence of the two-party system, the rise and fall of party government in Congress, the ascendancy of Congressional committee power and the seniority system, and the building of the modern administrative and regulatory state are among the topics explored. (F,SP)
102. The American Executive. (4) Three hours of lecture and one hour of discussion per week. An analysis of principal institutions, functions, and problems of the Presidency and the federal executive branch. Special attention will be given to topics of presidential leadership, staffing, executive-legislative relations, and policy formation. Comparative reference to executive processes in other political systems. (F,SP)
102W. The American Executive. (3) Three hours of seminar per week. Prerequisites: Admittance to UC Berkeley-Washington Program and consent of program director. Analysis of principal institutions, functions, and problems of the presidency and the federal executive branch. Special attention will be given to topics of presidential leadership, staffing, executive-legislative relations, and policy formation. (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. (S,SP)

103W. Congress. (3) Three hours of seminar per week. Prerequisites: Admittance to UC Berkeley-Washington Program and consent of program director. Nomination and election, constituent relations, the formal and informal structures of both houses, relations with the executive branch, policy formation, and lobbying. Sessions with Washington experts on Congress. Observation of congressional hearings and debates. (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. Concept and history of parties in the American context: their nature and function, origin and development. Party organization and structure, local party systems and their variations. Nominations and elections. One directed research paper will be required. (S,SP)

104W. Political Parties. (3) Three hours of seminar per week. Prerequisites: Admission to UC Berkeley-Washington Program and consent of program director. The institutional environment within which American politics takes place. Concept and history of parties in the American context: their nature and function, origin and development. Party organization and structure. (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. Sessions with local and national party workers on their vocation. Directed field research. (F,SP)

105W. The Politician. (3) Three hours of seminar per week. Prerequisites: Admittance to UC Berkeley-Washington Program and consent of program director. The nature of politics, the education of politicians, the structure of ambition, and the ethical values of social behavior in the political world. Sessions with elected officials and party workers on their vocation. (F,SP)

108A. Politics, Ethics, and Leadership. (4) Three to four hours of lecture and up to three hours 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 appro- priate exercise of power, fairness in process and pol- icy outcome, political obligations and duties, and the nature of political calculation. The materials of this course are drawn from case studies and theoretical political choices, relevant legal cases, comparative politics, guest speakers with political experience, and ethical theory. Cain, Staff

109A. Selected Topics in American Politics. (4) Course may be repeated for credit with different in- structor and content. Two hours of lecture and one hour of dis- cussion per week. Formerly 108. See departmental an- nouncements. (F,SP)

109W. Selected Topics in American Politics-UCDC. (3) Three hours of seminar per week. Prerequisites: Admission to UC Berkeley-Washington Program and consent of program director. Formerly 109W. Topics will vary. (F,SP)

Political Theory

110. Cal-in-the-Capitol. (2) Course may be repeated for credit with different instructor and department. Two hours of seminar per week. Must be taken on a passed/not passed basis. Prerequisites: Limited to summer Cal-in- the-Capitol interns. The course is designed to provide participants with the opportunity to become ac- quainted with some of the important issues facing our na- tional government and an appreciation of the way these issues are dealt with in Washington, D.C. The course of study will be led by political experts who will make demands of the students’ re- search skills.

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 UC Berkeley students with a rudi- mentary understanding of our state government. We will focus on the state legislature and executive branch, examine both the policy-making process and the pol- itics in Sacramento, which we will learn are quite closely related to one another. Cain

111A. Politics and the News Media. (3) Three hours of lecture per week. This course’s objective is to de- scribe and analyze the ways in which the news media have become a part of the political system. In order to understand the manner in which news organizations interact with officials, organized groups, and the public focus will be on media influences in areas such as war, get to make policy and the outcome of policy making. (F,SP) Staff

111B. Political Communications and National Gov- ernment. (4) Three hours of lecture per week. The term “political communications” describes the ways in which politically important individuals get their message to their intended audiences. The study of political com- munications involves those messages that are sent through intermediaries, as often in an indirect as direct manner, that influence or change the behavior of the recipients. (F,SP) Staff

112A. History of Political Theory. (4) Three hours of lecture, two hours of discussion, and one hour of con- ference per week. Major theories from the ancient Greeks to the modern period. Ancient and medieval political thought, including Plato, Aristotle, and St. Au- gustine.

112B. History of Political Theory. (4) Three hours of lecture, two hours of discussion, and one hour of con- ference per week. Early modern political thought up to the French Revolution, including Machiavelli, Hobbes, Locke, and Rousseau.

112C. History of Political Theory. (4) Three hours of lecture, two hours of discussion, and one hour of con- ference per week. Nineteenth and twentieth century political thought, including Burke, Utilitarianism, Marx, and contemporary theory.

113A-113B. American Political Theory. (4) Three hours of lecture and two hours of discussion/confer- ence per week. Basic problems of political theory as viewed within the context of American history and in- stitutions.

115C. Marxism and Culture. (4) Three hours of lecture and two hours of discussion per week. The pur- pose of this course is to trace the development of Marxism as an economic, social science, and political ideology since its inception, focusing particularly on developments in “Communist” or “State Socialist” systems, but also in- cluding a brief look at Eurocommunist thought. (F,SP)

116. Selected Topics in Political Theory. (4) Course may be repeated for credit with different instructor. Three hours of lecture and one hour of discussion per week. Prerequisites: One semester of 112 or 113. Intensive study of one topic, problem, or intellectual movement in political theory. Topic will vary with in- structor.

118AC. Three American Cultures. (4) Course may be repeated for credit with department approval. Three hours of lecture per week. The course will examine American cultural forms. The focus of the course is to be comparative; readings will center around first- person accounts, written by members of the ethnic groups most immediately involved in each of the cul- tural forms. The theme is that of identity, seen politi- cally as well as culturally: examining how the various ethnic groups involved came to forge a collective iden- tity for themselves. The three groups studied will vary by instructor. See departmental listings for more spe- cific information. Topic will satisfy the American cultures requirement. (F,SP)

International Relations

120A. International Relations. (4) Three hours of lecture and one hour of discussion per week. Com- parative foreign policy. (F,SP)

121A. International Organizations. (4) Three hours of lecture and one to three hours of discussion per week. Prerequisites: 120B. Formerly 121. United Na- tions, Organization of American States, NATO, War- saw Pact, Organization of African Unity, Arab League, Haas.

122A. Politics of the European Union. (4) Three to four hours of lecture and up to two hours of discussion per week. This course deals with the origins, devel- opment, and future of Europe, including both the policy-making process and the pol- itics in the European Union, which we will learn are quite closely related to one another.

123. Selected Topics in International Relations. (4) Maybe repeated for credit with consent of instructor. Three hours of lecture and one hour of discussion per week. Prerequisites: 120A strongly recommended. See departmental announcements. Topic will vary with in- structor.

124A. War and Politics in History. (4) Three hours of lecture and one hour of discussion per week. The nature and causes of war; the relationship of politics to war in history; historical varieties of strategic doctrine; the implementing of strategy; the endings of war.

124B. Politics and Military Strategy. (4) Three hours of lecture and one hour of discussion per week. The in- terrelations among military strategy, diplomacy, and political science, relationships between strategic doctrine, na- tional security concepts, and domestic politics.

126A-126B. International Political Economy. (4;4) Three hours of lecture and one hour of discussion per week. Economic theories in the study of international political behavior. Concepts influencing the choice of economic policies.

127A. International Law. (4) Three to four hours of lecture and up to two hours of discussion per week. This course is an introduction to public international law for students of international relations. The primary pur- pose of this course is to enable students’ under- standing of the ways in which international law orders international politics. How and to what extent has it been used in resolving conflicts between nations? How can we assess to what extent has it facilitated the achievement of common goals? What is the relationship between in- ternational law and states’ foreign policies? Emphasis throughout the course is on the substantive rules of the international legal system and their relationship to international politics, and on historical episodes that illustrate the issues. Sub- stantive areas include international human rights, in- ternational trade law, and international law and the use of force. (F,SP) Staff

128. Chinese Foreign Policy. (4) Three hours of lecture and one hour of discussion per week. This course will focus on media influences in areas such as economic transformation, and social forces. Relations with former republics of the USSR, with Euro- pe, China, and the United States. The impact of do- mestic changes on foreign relations, and the impact of the international environment on internal changes. Impact of democratization efforts in Russia and for international security.

129. Communist and Post-Communist Interna- tional Relations. (4) Three hours of lecture and one hour of discussion per week. The formation and evolu- tion of international communism. The forms and func- tions of interparty and international competition. The emer- gence of the Soviet bloc in Eastern Europe and the Sino-Soviet alliance. The collapse of that movement with the end of Soviet power in the USSR and Eastern Europe. Relations among the new states of Eastern Europe and the former Soviet Union. Breslauer

Empirical Theory and Quantitative Methods

132A. Quantitative Methods for Political Science. (4) Three hours of lecture and one hour of discussion per week. Comprehensive introduction to research methods, statistical analysis, and computer usage in the social sciences. Empirical analysis and interpretation of existing empirical research and indi- vidual student research projects. Meets basic method- ological needs of all political and social science majors.

132B. Quantitative Methods for Political Science. (4) Three hours of seminar and one hour of discussion per week. Prerequisites: 132A. Comprehensive intro- duction to research methods, statistical analysis, and computer usage in the social sciences. Emphasis on cri- terion analysis and interpretation of existing empirical research and individual student research projects. Shanks

133. Selected Topics in Quantitative Methods. (4) Course may be repeated for credit with topic varies. Three hours of lecture and one hour of discussion per week. Prerequisites: A previous course in statistics or data analysis. For more information see course description on department web site when course is offered.

C135. Game Theory in the Social Sciences. (4) Three hours of lecture and one hour of discussion per week. See 135 for course description and prerequisites. Formerly 135. A non-technical in- troduction to game theory. Basic principle, and models to what is happening in politics and political economy in

Economics 104. Three hours of lecture and one hour of discussion per week. Prerequisites: Limited to summer Cal-in- the-Capitol interns. The purpose of this course is to provide Cal-in-Sacramento interns and other interested UC Berkeley students with a rudi- mentary understanding of our state government. We will focus on the state legislature and executive branch, examine both the policy-making process and the pol- itics in Sacramento, which we will learn are quite closely related to one another. Cain

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112B. History of Political Theory. (4) Three hours of lecture, two hours of discussion, and one hour of con- ference per week. Early modern political thought up to the French Revolution, including Machiavelli, Hobbes, Locke, and Rousseau.

112C. History of Political Theory. (4) Three hours of lecture, two hours of discussion, and one hour of con- ference per week. Nineteenth and twentieth century political thought, including Burke, Utilitarianism, Marx, and contemporary theory.

113A-113B. American Political Theory. (4) Three hours of lecture and two hours of discussion/confer-
Comparative Politics

136B. Method in Comparative Analysis. (4) Three hours of lecture and one hour of discussion per week. The comparative method. Application of the comparative method in the field of comparative politics. Use of comparison in description, hypothesis-testing, and theory-building. Prerequisites: C135A. Methodical issues that arise in comparing national units and in making comparisons across different cultures.

137A. Revolutionary Change. (4) Three hours of lecture and one hour of discussion per week. Theories of revolution, terrorism, rebellion, and revolution. Strategies of revolution, terrorism, sources of revolutionary action.

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 capitalism, industrial society and the post-industrial age.

137C. Transitions to Democracy. (4) Three hours of lecture per week. This course offers intensive, comparative study of the wave of democratization that has swept major Latin American countries, Eastern Europe and the former Soviet Union during the last two decades. The course will analyze the theoretical literatures on regime change and compare the experiences of transition from bureaucratic authoritarianism, military rule, and socialism. The course will investigate the meaning of democracy, democratic transition, the roles of mass movements and the process of democratization, problems of nationalism and ethnic conflict, and the relationship between democratization and economic systems.

138A. Democracy, Democracies. (4) Course may be repeated for credit with consent of department. Three hours of lecture and one to three hours of discussion per week. The course deals with issues of political system, the role of the people versus other political systems. The second part deals with empirical theories about why some countries are democracies and others are not. The third part looks at whether institutional choices make a difference in the consolidation and performance of democracies.

138B. The Politics of Market Economies: The National Roots of the Global Economy. (4) Three hours of lecture and one to three hours of discussion per week. This course will focus on the major industrial countries of Asia, Japan, and the United States. It considers the adjustments they make in the changing international economy and highlights the role of domestic and international politics in those adjustments. The countries which most effectively manage this historical transition will establish their political and economic positions for the future. Competitive development strategies make the experiences of foreign countries of great practical importance to the United States and the global economic system.

138C. Comparison of Party Systems. (4) Three hours of lecture and one hour of discussion per week. This course provides an introduction to the study of political parties in party systems in democratic societies. It examines the historical origins of parties and party systems, the main lines of cleavage in democratic politics, the substance and importance of ideology in party systems, parliamentary arrangements, governing coalitions, and the policy consequences of political parties.

138D. Governance of the E-conomy. (4) Three hours of lecture and one to three hours of discussion per week. Prerequisites: Two lower division courses in social sciences or history or consent of instructor. This course examines the impact of digital technologies, changing market structures, and innovative business organizations 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, polity, and society. The means of making and implementing these choices is politics. The necessarily global scope of E-commerce extends political and policy challenges to the international arena. This course will explore the literature on the political economy of the Internet to determine what policy choices - and hence which policies - are likely to be most important. We also will examine our conceptual understanding of the burgeoning digital economy and its impact on politics, law, and socio-economic relations.

138E. The Varieties of Capitalism: Political Economic Systems of Europe. Three hours of lecture and one hour of discussion per week. This course examines the interaction between politics and markets, both in theory and in practice, explicitly linking classic works to contemporary political economy with 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 countries, 4) The newly industrializing economics 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.

139B. Development Politics. (4) Three hours of lecture and one hour of discussion per week. Politics of economic development in developing countries. Comparative analysis of the theories and practice of development in the light of contemporary experience. Political strategies of agrarian, industrial, developmental, and regional development and their impact on autonomy, welfare, justice, and human development.

139C. Selected Issues of Development Politics. (4) Course may be repeated for credit as topic varies. Three hours of lecture and one hour of discussion per week. This course examines the theoretical, political, and practical dimensions of development politics. Topics will vary with instructor.

140C. Politics in the Post-Communist World. (4) Three hours of lecture and one hour of discussion per week. Comparative analysis of divergent paths of development among the almost 30 new states that formerly comprised the Soviet Union and Eastern Europe. Focus on changes in politics, economics, social stratification, culture, and international relations. Implications for theories of development and modernization.

140D. Selected Topics in Comparative Politics. (4) Course may be repeated for credit with consent of department. Three hours of lecture and one hour of discussion per week. See departmental announcements. Topics will vary with instructor.


142B. Middle East Politics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 142A. The Middle East in world affairs, international relations and domestic politics of contemporary states in the Middle East; policies and strategy of major powers; supranational movements, political and military security organizations. The area comprises Turkey, Iran, Afghanistan, Israel, and the Arab countries.

143A-143B. Northeast Asian Politics. (4,4) Three hours of lecture and one hour 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.

144A. Rapid Growth in East Asia. (4) Three hours of lecture and one hour of discussion per week. An analysis of modern Korea, Taiwan, Japan, Korea, and Taiwan. This course will argue that the national strategies of the three countries represent significant, and in some ways complementary, variations on a common theme of externally-oriented development. Japan represents the triumph of flexible "lean production", Korea's strength is in mass production, while Taiwan aims at rapidly changing market niches.

144B. Politics of Divided Korea. (4) Three hours of lecture and one hour of discussion per week. An examination of modern Korea, South 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.

145B. South Asian Politics. (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.

146B. African Politics. (4) Three hours of lecture and one hour of discussion per week. In-depth analysis of selected African states, focusing on their contemporary state structures and political systems, and the nature of current political processes and problems. Cases are chosen so as to highlight contrasts among the dominant political structures and of conflict between South Africa and her neighbors. The role and significance of the United States in the process of conflict and change in southern Africa will also be discussed at some length.

147A. Western European Politics. (4) Three hours of lecture and one hour of discussion per week. Primary emphasis on the Republic of South Africa, focusing on the evolution of the system of racial rule, the politics of apartheid, and on pressures for political change. Analysis of South African politics is placed within the context of regional politics and of conflict between South Africa and her neighbors. The role and significance of the United States in the process of conflict and change in southern Africa will also be discussed at some length.

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. Modernization, commercialization of agriculture, English and French revolutions, industrialization, national unification, working class incorporation, democratic and authoritarian regime outcomes, contemporary politics and policy. Focus on Britain, France, Germany, and Italy.


147H. The Domestic Politics of Postwar 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, Italy and Sweden—have confronted the common problems in the postwar period. (F,SP) Levy.

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 develop-
omment and modernization and political change. Comparative study of political systems, institutions, groups, and political culture.

149. Selected Topics in Area Studies. (4) Course may be repeated for credit with different topic and consent of instructor. Three hours of lecture and one hour of discussion per week. See departmental announcements. Topic will vary with instructor.

Public Law and Jurisprudence

150. The American Legal System. (4) Students who have completed 150A during the 1983-84 or 1984-85 academic year will receive no credit for 150. Three hours of lecture and one hour of discussion per week. The nature of the American legal system; the relationship of judges, lawyers, police, political officials, bureaucrats, press, and general public; the political and social aspects of the legal process. (F)

151. The Jury System. (4) Students who have taken 151B during the 1983-84 or 1984-85 academic year may be repeated for credit with consent of department. Three hours of lecture and one hour of discussion or conference per week. The place of the jury in the judicial and political system. Selection and behavior of juries on the local, state, and federal levels.

157A-157B, Constitutional Law of the United States. (4;4) Three hours of lecture and one hour of discussion per week. Fundamental principles of constitutional law, leading cases, causes, and consequences of legal decisions.

A. Civil Rights
B. Civil Liberties. (F,SP)

Political 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)

C163A. Religion and Politics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Formerly 163A. The interaction of religion and politics. The primary focus is the relationship of religion to modern American politics. This core will be supplemented by historical and comparative analyses of the role of religion in politics. Also listed as Religious Studies C185A. Sperlich

C163B. Religion and Politics. (4) Three hours of seminar and one hour of discussion per week. Prerequisites: Consent of instructor. Formerly 163A. The interaction of religion and politics. The primary focus is the impact of religion on modern American politics. This core will be supplemented by historical and comparative analyses of the role of religion in politics. Also listed as Religious Studies C185B. Sperlich

164A. Political Psychology and Involvement. (4) Three hours of lecture and one hour of discussion per week. An inquiry into political behavior: psychological roots of decision-making; leadership; psychological sources of political belief; conflict theory.

169. Selected Topics in Political Behavior. (4) Course may be repeated for credit with consent of department. Three hours of lecture and one hour of discussion per week. See departmental announcements.

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.

175A. Urban and Metropolitan Government and Politics. (4) Three hours of lecture and one hour of discussion per week. The roles of various levels of government—local, regional, state, and national—in politics and policy-making in metropolitan regions. (F)

176. The Unseen America. (4) Three hours of seminar per week. Must be taken on a passed/not passed basis. Social science methods and philosophies; on-site observation of “unseen” parts of local community: war veterans, mentally ill, alcoholics, prisoners, military personnel, factory workers, et al. Frequent field trips led by undergraduate student coordinators. Classroom discussions also directed by undergraduate student coordinators under the direction of the sponsoring faculty. (F)

177B. Political Internship Program. (4) Three hours of lecture per week. The student will work for two hours each week. Must be taken on a passed/not passed basis. Prerequisites: Consent of faculty sponsor and department chairperson. Juniors and seniors only. Supervised internship in a participating government agency. Students must submit 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 no fewer than 35 double-spaced pages. For permission or further restrictions, students must contact the sponsoring faculty in advance. Also listed as History of Art C196W, Undergraduate Interdisciplinary Studies C196W, Women’s Studies C196W, Mass Communications C196W, History of Art C198W, Political Economy of Industrial Soc C198W, and Sociology C196W.

197. Field Study in Political Science. (1-3) By arrangement with faculty. Must be taken on a passed/not passed basis. Prerequisites: Consent of faculty sponsor 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.

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 passed/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. (F,SP)

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 passed/not passed basis. Prerequisites: Open only to juniors and seniors. Enrollment is restricted by departmental 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 departmental announcements.

201A-201B. Comparative Analysis of Industrial Democracies. (4,4) 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 economic development on political change. The effect of labor politics on national politics.

201C. Globalization and Liberalization: The Politics of Deregulation, Reregulation, and Mesoregulation. (4) Three hours of seminar per week. The course will examine the advance of global and economic liberalization and the relationship between these two processes. Levy, Zysman

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, polity, and society. The means of making these choices is politics. The necessarily global scope of the E-ceny extends the political and policy challenges to the international arena. This course will explore the literature on the political economy of the Internet to de
term what policy choices — hence political debates — are and will be most important. We also will examine our conceptual understanding of the burgeoning digital economy and its impact on politics, law, and socio-economic relations. (F,SP) Zysman

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.

202B. Theories of Development and Political Change. (4) Three hours of seminar per week. Issues of social organization and political change. General theoretical formulations as they relate to processes of economic, social and political change in the context of several Third World countries.

203. Comparative Analysis of Communist Societies. (4) Three hours of seminar per week. An analysis of the interrelations between Communist systems with particular reference to institutional and ideological differences, presented at an advanced level for graduate students. Discussion and papers required.

205. The Nation-Building Process. (4) Three hours of seminar per week. The nation-state is the most significant political unit in the contemporary world. This course focuses on its origins, essential characteristics as well as on different patterns of national development, the condition of national development to modernization, the role of internal and external factors in the national development process and current challenges to the national definition of political life.


208. Development Policy. (4) Three hours of seminar per week. Comparative analysis of the politics of economic development. The theories and practice of political action of the state and other organizations related to agricultural, industrial, and educational developments for national purposes. Relation of various world regions.

209A. Comparative Political Economy. (4) Emphasis on three models of modern society—post-industrial, “capitalist” and “socialist”—as they are practiced in countries labelled capitalist, socialist, pluralist and totalitarian. The aim: to evaluate convergence theory and explore divergent paths of development among advanced countries. Special attention to stratification, social mobility, and human capacity. Students from other disciplines are welcome.

209B. Comparative Political Economy. (4) Emphasis on three models of modern society—post-industrial, “capitalist” and “socialist”—as they are practiced in countries labelled capitalist, socialist, pluralist and totalitarian. The aim: to evaluate convergence theory and explore divergent paths of development among advanced countries. Special attention to stratification, social mobility, and human capacity. Students from other disciplines are welcome.

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 departmental announcements. Topic will vary with instructor.

213. American Political Theory. (4) Three hours of seminar per week. Prerequisites: 112A or consent of instructor. Basic problems of political theory will be examined within the context of American political development.

214. Themes in Western Political Theory. (4) Course may be repeated for credit. Three hours of seminar per week. Themes to be specified by instructor.

217. Politics and Culture. (4) Three hours of seminar per week. An examination of interrelationships of politics, personality, and culture, normally with specific focus on American materials. Research papers will be written and discussed during the semester.

218A-218B. Colloquium in Political Theory. (4-4) Three hours of seminar per week. An intensive examination of the nature of political theory and the enterprise of theorizing about politics, with attention to selected aspects of social science theory and contemporary philosophy.

219. Symposium in Political Theory. (4) Course may be repeated for credit with consent of instructor. Three hours of seminar per week. Forum for the presentation of original work in political theory.

International Relations

220A. Theories of International Relations. (4) Three hours of seminar per week. Prerequisites: Previous work in international relations. Origin, application and utility of major concepts examined in the study of international relations. Historical, ideological and political aspects of international relations and political theory to international relations.

220B. Theories of International Relations. (4) Three hours of seminar per week. Prerequisites: 220A. The construction of theories in the field of international relations.

221. International Organization. (4) Three hours of seminar per week. Evolution of international institutions in response to changes in knowledge and international political conditions in fields of economic relations, science and technology, health, education, welfare, and management of conflict as reflected in United Nations and specialized agencies, regional organizations, and common markets.

222. Nationalism and Imperialism. (4) Three hours of seminar per week. Prerequisites: 200 or 220. Themes in the theory of nation-building illustrated with Western and non-Western case studies.

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 departmental announcements. Topic will vary with instructor.

226A-226B. International Political Economy. (4-4) Three hours of seminar 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 activities relating to trade, money, resource use, technology, and physical environment.

228. National Security Policy. (4) Three hours of seminar per week. Evolution of military doctrine, especially since World War II; the role of Congress and the Executive Branch in the making of security policy; arms racing and arms control; the political economy of change; prospects for the future.

229. Soviet and Post-Soviet Foreign Policies. (4) Three hours of seminar per week. Soviet foreign relations from 1917 through Gorbachev. The impact of the collapse of the USSR on Russian foreign policies.

230. Theories of Development and Political Change. (4) Three hours of seminar per week. Prerequisites: Consent of instructor. See departmental announcements. Topic will vary with instructor.

231A. Quantitative Analysis in Political Research. (4) Three hours of seminar per week. Prerequisites: 132A-132B or Statistics 130A. Introductory course in the analysis of political data.

231B. Quantitative Analysis in Political Research. (4) Three hours of seminar per week. Prerequisites: 231A or equivalent. Application of regression causal modeling and introductory econometrics, with special emphasis on procedures appropriate for political data, including survey data.

232A-232B. Formal Models of Political Science. (4-4) Three hours of seminar per week. Formerly 232A. A mathematical models of politics with applications to political learning, bargaining, and democratic theory.

233. Psychometric and Econometric Methods. (4) Three hours of seminar per week. Most political science data suffers from two major problems: the measures of theoretical constructs contain substantial amounts of error and the processes generating the data involve reciprocal causation (“simultaneity”) or selection effects. In addition, political scientists often only have nominal or ordinal measures for their concepts. This course explores methods for correcting these problems through careful statistical modelling.

234. Rational Choice Theory and Democratic Politics. (4) Three hours of seminar per week. This seminar will provide students with an introduction to the main contributions of economic models to our understanding and normative evaluation of politics in democratic states. The goal of the course is that students develop a familiarity with the potential applications of economic methodologies to the study of politics, while also gaining insights into the potential limitations of economic approaches. (F,SP) Schickler

235. Introduction to Research Methods. (4) Three hours of seminar per week. Overview of methods of political research. Theories, concepts, variables, hypothesis testing. Research design and quantitative methodology. Basic data collection techniques. Approaches to data analysis. Provides an overview of different statistical techniques, but does not teach statistical analysis.

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 departmental announcements. Topic will vary with instructor.

Area Studies

240A. The Pacific Rim. (4) Three hours of seminar per week. The purpose of this course is to provide a reasonably comprehensive overview of what has become known as the “Pacific Rim.” The course will focus on economic growth, regional security, and democratization. Also listed as Asian Studies C200. (SP) Dittmer

241B. Soviet and Post-Soviet Politics. (4) Three hours of seminar per week. Selected themes in Soviet and post-Soviet politics: political strengthening; state-society relations; ethnicity and nation-building; the political economy of change; prospects for the future.

241C. Politics and Government in Eastern Europe. (4) Two hours of seminar and one hour of consultation per week. Prerequisite: 1410C or equivalent or consent of instructor. The politics of the states of Eastern Europe with an emphasis on continuity and change in the modern period. The challenge of building viable economies and states after the dissolution of the Soviet bloc.

241D. Politics in the Post-Communist World. (4) Two hours of seminar per week. Reading and discussion seminar for graduate students. Comparative analysis of divergent paths of development among the almost 30 new states that formerly comprised the Soviet Union and Eastern Europe. Focus on changes in politics, economics, social stratification, culture, and international relations. Discussions of competing explanations for the observed patterns, and of their implications for theories of development, modernization, and international relations.

242. Topics in Middle East Politics. (4) Three hours of seminar per week. Prerequisites: 142A or 142B or consent of instructor. An advanced seminar, designed to encourage synthesis of empirical research and theoretical reflection. Focused each year on a specific dimension of Middle East politics (state formation, local politics, sectarianism, Islamic political thought, etc.). A seminar paper and class presentations are required.
244A. Analysis of Contemporary China. (4) Three hours of seminar per week. This seminar will focus on dynamic interactions of four major powers—the United States, former Soviet Union, China, and Japan—which are also global powers and two minor actors—South and North Korea—from bilateral, regional, and global perspectives. Lee

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 activities in China, Taiwan, South Korea, North Korea, and Japan. The course will examine historical literature on state-society relations, market, world system, as well as empirical case studies dealing with each nation covered. Lee

243C. Japanese Politics. (4) Three hours of seminar per week. Japanese domestic politics—issues in his- tory, political institutions, political parties—the United States, former Soviet Union, Korea, and Japan. The course will examine theoretical literature on state-society relations, market, world system, as well as empirical case studies dealing with each nation covered. Lee

243A. International Relations in East Asia. (4) Three hours of seminar per week. The seminar is chronologically divided into three sections: 1. Two weeks on the problems of conceptualization and methodology; 2. Four weeks on reading and analyzing primary materials from the recent period of "Supply and Demand"; and 3. A final period of oral reports on student research topics. Lee

244B. Analysis of Contemporary China. (4) Three hours of seminar per week. This second semester semester concentrates on the acquisition of bibliographical mastery of primary sources and the application research skills. The seminar is chronologically divided into three sections: 1. Two weeks on the problems of conceptualization and methodology; 2. Four weeks on reading and analyzing primary materials from the recent period of "Supply and Demand"; and 3. A final period of oral reports on student research topics. Lee

244C. Collective Action in Modern China: 19th-Century–1949. (4) Three hours of seminar per week. This course will explore the character and impact of popular movements in modern China, covering rebellion, revolution, missionary activity, secret societies, and urban riots in imperial and republican China. It will trace political and societal changes during the imperial and republican periods. Lee

244D. Collective Action in Modern China: 1949–Present. Three hours of seminar per week. This course will focus on dissent in the People's Republic of China; covering the May Fourth Movement and development of the communist revolution; the Hundred Flowers and the Democratic Movement, Democracy Wall, and the 1989 Uprising.

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. (SP)

245B. Southeast Asian Politics. (4) Three hours of seminar per week. Evaluation of the strengths and weaknesses of current literature in an attempt to design studies advancing the substantive knowledge as well as the theoretical and methodological sophistication of Southeast Asian studies. (F)

246. African Politics. (4) Three hours of seminar per week. Polity in Sub-Saharan Africa; relations of state and society in the context of weak state; state building; societal pluralism; the political role of ethnicity; cri-sis states and proto-national states; ethnic states; oppression and retributiveness; conflict and class formation; rebellion; ethnicity in modern development; modernization and ethnicity; and interstate conflict and international order.

247A-247B. Western European Politics. (4;4) Three hours of seminar per week. Major themes of politics and international relations of Western Europe.

247C. German Politics. (4) Three hours of seminar per week. Prerequisites: Consent of Instructor. The seminar provides a general overview of modern Ger- man political development in the context of Central Eu- ropean history, and detailed analyses of selected top- ics. Sperrich

248A-248B. Latin American Politics. (4;4) Either part of the 248A-248B sequence may be taken separately for credit. Three hours of seminar per week. Prerequisites: Consent of Instructor. (SP)

251. Political Science / 385

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 re- sponses to problem of legal legitimacy, authority, parity, choice, and the organization of enforcement and deci- sion-making processes. Readings include empirical studies, judicial opinions, jurisprudential writings and other sources. Lee

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 deci- sion, judicial behavior. (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 departmental announcements. Topic will vary with instructor.

260. Political Behavior. (4) Three hours of seminar per week. A comprehensive review of the major topics in political behavior through intensive examination of the theories, findings, and proceedings of the most sig- nificant studies in the field.

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.

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 departmental announcements. Topic will vary with instructor.

271A-271B. American Government. (4;4) Three hours of seminar per week. Credit and grade to be awarded on completion of sequence. The principal topics are American national politics, including public opinion, elections, parties, interest groups, Congress, the presidency, the bureaucracy, and policy information. Wolfinger

272A-272B. National Policy Making. (4;4) Three hours of seminar per week. Credit and grade to be awarded on completion of sequence. Formally 272. National policy-making processes, concentration on congress, the presidency, and interactions among pol- icy-making interests and development of their dissertations.

273. Urban Politics. (4) Three hours of seminar per week. Politics and policy making in American cities. Historical, economic and social context of cities. Ma- jor urban political institutions, other levels of govern- ment in urban affairs.

274. American Political Development. (4) Three hours of seminar per week. This course will consider several broad themes in American political development. The objective is to extract the central conditions, processes, and controversies that scholars have found running through American political development and try to present them with possible relations among them. (F,SP) Schickler


277. Political Regulation. (4) Three hours of seminar per week. Course is cross-listed with 275. This course lies at the intersection of political science and legal studies. The seminar is cross-listed with 275. Open to qualified graduate students wishing to study the constitutional and legal foundations of public policy, as well as the application of those foundations to the design and evaluation of public policy. (SP)

278. The American System in Comparative Per- spective. (4) Three hours of seminar per week. Credit and grade to be awarded on completion of sequence. Read, discuss, and analyze a variety of studies of the American system in order to identify its main features and evaluate the principal theories about why the sys- tem has those features and what consequences they have.

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 departmental 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 or- ganization and management theory, emphasizing the major writers and distinctive contributions of various disciplines.

280B. Comparative Administration. (4) Three hours of seminar per week. A comparative analysis of the structures and processes which are used to control public bureaucracies in selected political systems and the effects of those controls on the character of ad- ministrative performance.

280C. Public Policy and Decision-Making. (4) Three hours of seminar per week. The process of pub- lic policy formulation, governmental planning and pro- grammation, and administrative decision-making.

287. Development Administration. (4) Three hours of seminar per week. The problems of administering economic development programs in poor countries. Particular emphasis is placed on rural development, the problems of relating bureaucratic structures to peasant communities, and the relevance of organi- zation 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 departmental announcements. (F,SP)

Special Studies

290. Dissertation Research. (4) Course may be re- peated 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 research, the preparation of research de- signs and proposals for outside funding, field work, and writing and presenting the results of completed re- search. Presentations by graduate students working on theses. (SP)

292. Directed Advanced Study. (2-6) Course may be repeated for credit. By arrangement with faculty. Prerequisites: Consent of instructor and graduate ad- viser. Open to qualified graduate students wishing to pursue special study and research under direction of a member of the staff. (SP)

298A. Cross-Listed Course. (4) Course may be repeated for credit. This course is cross-listed with 275. Open to qualified graduate students wishing to study the constitutional and legal foundations of public policy, as well as the application of those foundations to the design and evaluation of public policy. (SP)
Psychology
(College of Letters and Science)

Department Office: 3210 Tolman Hall, (510) 642-5292
http://ls.berkeley.edu/psyc

Chair: Karen K. DeVaux, Ph.D.

Professors
S. Marc Breedlove, Ph.D. University of California. Behavioral endocrinology, developmental neurobiology
Joseph J. Campos, Ph.D. Cornell University. Social/emotional development of infants; perceptual development
Mark V. Covington, Ph.D. University of California. Problem-solving, thinking, educational applications
Philip A. Cowan, Ph.D. University of California. Comparative behavior in mammals
Ervin R. Halberstam, Ph.D. University of Texas. Auditory perception and psychophysics; attention
John Kihlstrom, Ph.D. University of Pennsylvania. Cognition in personal and social contexts, unconscious mental processes, hypnosis
Robert Knight, M.D. Northwestern University. Attention and memory, neurophysiology and psychology, cognitive neuroscience
Jonas Langer, Ph.D. Clark University. Cognitive development in infancy and early childhood, primates
Robert W. Levenson, Ph.D. Vanderbilt University. Human psychophysiology, emotion, culture, aging, and marriage
May S. Myers, Ph.D. Johns Hopkins University. Attachment, individual differences in relationship representation in discourse, drawing, and narrative, ethnicity

Affiliated Professors
Martin Banks, Ph.D. (Optometry)
Paul Ekman, Ph.D. (University of California, San Francisco)
Robert MacCoun, Ph.D. (Public Policy)
Richard Muirhead, Professor Emeritus (University of California, San Francisco)
Kurt Organista (Social Welfare)
Michael A. Raine, Ph.D. (Education)
William McKinley Runyan, Ph.D. (Social Welfare)
Lorraine R. Snowden, Ph.D. (Social Welfare)
Elliot Turiel, Ph.D. (Education)
David Wessel, Ph.D. (Music)
Yu-Wen Ying (Social Welfare)

Associate Professors
Carolyn Pape Cowan, Ph.D. Center for Psychological Research.
Walter K. Debs, Ph.D. (Emeritus) Psychology of women; creativity
Tina Dobbins, Ph.D. (Emeritus) Development in infancy; learning, cognition, socio-emotional processes
Ravenna M. Helson, Ph.D. University of California. Personality, temperament, learning, social psychology
Chinara H. Kappas, Ph.D. (Emeritus) Culture and animal behavior; social and comparative psychology
Seth D. Roberts, Ph.D. Brown University. Depression, mood, sleep, human circadian rhythms

Assistant Professors
Karen K. DeVaux (Chair), Ph.D. Indiana University. Vision, psychophysics and physiology
Russel L. Dehaene, Ph.D. University of Michigan. Sensory physiology, color and spatial vision, visual perception
Stephanie E. Blickman, Ph.D. McGill University. Comparative behavior in mammals
Ervin R. Halberstam, Ph.D. University of Texas. Auditory perception and psychophysics; attention
John Kihlstrom, Ph.D. University of Pennsylvania. Cognition in personal and social contexts, unconscious mental processes, hypnosis
Robert Knight, M.D. Northwestern University. Attention and memory, neurophysiology and psychology, cognitive neuroscience
Jonas Langer, Ph.D. Clark University. Cognitive development in infancy and early childhood, primates
Robert W. Levenson, Ph.D. Vanderbilt University. Human psychophysiology, emotion, culture, aging, and marriage
May S. Myers, Ph.D. Johns Hopkins University. Attachment, individual differences in relationship representation in discourse, drawing, and narrative, ethnicity

Psychology
(College of Letters and Science)

Degree 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.

The major attempts to give basic and well-rounded coverage of most of the main established fields of psychology. The areas covered include social, developmental, biological, comparative, industrial, clinical, and cognitive psychology, learning (human and animal), perception, personality, and psycholinguistics.

The fact that psychology is so diverse means, however, that all of these areas of study cannot be represented within the expertise or primary interest of a single faculty or department. This is true at Berkeley, where each emphasis is useful for different major research and theoretical analysis of fundamental aspects of animal and human behavior. Since students who are interested in the major often have been exposed to introductory courses with emphases different from those present at Berkeley, prospective majors are strongly urged to examine closely our upper division course offerings to see if they are consonant with their interests in psychology. For information concerning alternative programs, contact the Student Services Office, 3305 Tolman Hall.

The major serves three purposes: (1) For the liberal arts student, the study of psychology provides an avenue for increased self-understanding and insight into the behavior of others. The objective study of behavior is only one of the major theories of the intellectual history of the last hundred years. (2) For students preparing for training in such professions as medicine, law, education, and business, psychology provides important basic knowledge and principles. (3) For students planning graduate work in psychology, the undergraduate major seeks to establish a solid foundation. It should be emphasized that while the major provides excellent preparation for further training in a variety of areas, the undergraduate program in psychology does not prepare the student for a position as a professional psychologist.

The primary goal of the major is to ensure that the student becomes aware of the diversity within the discipline and of the interrelationships among the different subareas of psychology. More specifically, the major consists of (1) a set of prerequisites; (2) a breadth sequence; (3) an upper division course in statistics and methodology; and (4) additional courses to bring the completed upper division units to 24. Most students will begin requiring approximately 30 semester course in statistics and methodology; and (4) additional courses to bring the completed upper division units to 24. Most students will begin requiring approximately 30 units to satisfying these requirements. As many of the courses that may be used to satisfy requirement (4) will be more meaningful to students who have completed requirement (3), students should plan to take 101 early in the major.

Note: Students will be admitted to the major only once a year in the fall semester. Applications will be available in the Student Services Office, 3305 Tolman Hall, in April.

The Major
Lower Division. Prerequisite courses must be taken on a letter-grade basis (except when a course is offered only on a P/NP basis) and must be completed with a C or higher in each course. Prerequisite areas and their respective courses and options are listed below.

Psychology: Psychology 1.

Biological Science: Two courses from the following:

Biology 1A-1B, 11, Molecular and Cell Biology 11, 32, 61, 64, Integrative Biology 30, 31.
Evolution: One course from Anthropology 1, Molecular and Cell Biology 41X, Integrative Biology 60.

Social Science: Two courses from the following: Anthropology 3 or 17; Linguistics 5; Sociology 3.

Quantitative: Statistics 2, 20, or 21.

Upper Division. 1. Research Design and Methods: Psychology 101 (4 units, offered fall and spring).

2. Breadth: Psychology 100A-100B (4-4 units, admission in fall only; must be taken in sequence).

3. Electives: 12 units of upper division psychology course work. Only two decade courses (course number: e.g., 130, 140, 150, 160) may be used to satisfy this requirement.

4. Total units: 24 (no more than one 198 or 199 of at least 2-unit value may count toward the major).

No courses to be counted toward the completion of the upper division requirements may be taken on a passed or not passed basis except with the explicit approval of the major adviser.

Honors Program. Admission to the honors program is limited to senior psychology majors with a 3.5 grade-point average overall and in upper division psychology courses. Students complete Psychology H194A-H194B (Honors Seminar) and Psychology H195A-H195B (Honors Project). Evaluation of the thesis is the responsibility of, first, the faculty supervisor and then of the departmental committee on undergraduate honors. It is the responsibility of the latter group to decide on the level of honors to be awarded. Additional information concerning the honors program is available in the Student Services Office, 3305 Tolman Hall.

Graduate Study

Preparation. The Department of Psychology re-

quires completion of an undergraduate major in psychology or a cognate field as the best prepa-
action for graduate study. The upper-division pro-

gram should include a course in statistical methods and a laboratory in experimental psychology. The number of fully qualified applicants always greatly exceeds the number admitted; therefore, the prospective applicant who has little or no background in psychology is advised to defer applica-

tion until appropriate undergraduate course work has been completed.

Graduate Training Programs. The graduate pro-

gram is designed for doctoral students interested in pursuing advanced study and conducting original research in psychology. New admissions are restricted to the Ph.D. Program. Students are accepted for the fall semester only. Detailed information concerning financial aid, and degree requirements are displayed on the depart-

ment web page at http://psychology.berkeley.edu/ or in the department brochure. The brochure and admission application can be obtained by writing to the Student Services Office, Department of Psychol-

ogy, University of California, Berkeley, Berke-

ley, CA 94720-1652, or the application can be filled out online using the Web site noted above.

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 pro-

grams, is the primary responsibility of faculty mem-

bers in the following areas: behavioral neuro-

science, clinical, cognitive, developmental, and social psychology. Courses of each of the five pro-

grams are a set of proseminar courses. These courses are designated as "decade" courses (i.e., 200, 210, 220, etc.) and are offered yearly or every other year. All courses are intended to provide the core content necessary for a student to become an effective scholar and researcher in the area of spe-

cialization. Students are expected to affiliate them-

selves with one of the area programs and to com-

plete the core sequence for that area. Depending upon the area, additional course requirements might consist of (1) courses on methodology, experimental design, and statistical analysis. (2) courses selected from other areas either within or outside of the Psychology Department. (3) ad-

vanced courses and seminars in the area of spe-

cialization, and (4) individual study and research (298 and 299). Many programs require a major re-

search thesis at the end of the second-

year of graduate study. All students are required to serve at least two semesters as a graduate student instructor in order to be eligible for the Ph.D. Degree. The requirement of all programs consist of the successful passing of the qualifying examination, taken usually during the third year, and the submission and approval of the dissertation.

General Psychology

Further Information. The Schedule of Classes is-

suited before the beginning of each semester and the course descriptions issued at the beginning of each semester provide more detailed and up-to-date information about courses offered by the Psychology Department. Please 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 prin-

cipal areas, problems, and concepts of psychology. This course is required for the major; students not con-

idering a psychology major are directed to 2. (F,SP)

2. Principles of Psychology. (3) Students will not re-

ceive credit for 2 after taking 1. Three hours of lecture per week. An overview of psychology for students who will not major in the field. This course satisfies the pre-

requisite for upper division courses, but not for 100A-100B or for the major. (F,SP)

14. Psychology of Gender. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 1 or consent of instructor. Examination of various factors in the development of feminine and masculine roles, including personality, social processes, biology, and culture.

24. Freshman Seminars. (1) Course may be re-

pealed for credit as topic varies. One hour of seminar per week. Preparation. The Berkeley Seminar Program has been designed to provide new students with the op-

portunity to explore an intellectual topic with a faculty member. Seminars are offered in all campus departments, and topics vary from department to department and semester to semester.

39. Freshman/Sophomore Seminar. Course may be re-

peated for credit as topic varies. Seminar format. Prerequisites: Permission of instructor and 3.4 GPA or higher. Freshman and sophomore seminars offer lower division students the opportunity to explore an intel-

lectual 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 de-

partment to department and from semester to semester.

45. Freshman Seminars. (1) Two hours of seminar per week. Must be taken on a passed/not passed ba-

sis. Prerequisites: Open to students in the Psychology Freshman Cluster Program. Weekly discussion of the nature, methods and aims of contemporary psychol-

ogy. Students are expected to read an article each week and actively participate in the discussion with the speaker. (F)

99. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: 1 or consent of instructor and 3.4 GPA or higher. Int-

tended for freshmen and sophomores who wish to un-

dertake a program of individual inquiry on a topic in psychology. (F,SP)

Upper Division Courses

Psychology 1 is prerequisite for all upper division courses. Additional requirements are also stated for certain courses.

100A-100B. Theory and Research in Psychology. (4-4) Three hours of lecture and one hour of discus-

sion per week. Prerequisites: Completion of the pre-

requisites for the psychology major. The course is re-

quired of, and limited to, psychology majors. Both semesters are required for the major and must be taken in sequence beginning with 100A in the fall when the student is admitted to the major. 100A will cover bi-

ological, cognitive, and developmental psychology. 100B, taken in the spring, will cover social, personal-

ity, and clinical psychology. (F,SP)

101. Research and Data Analysis in Psychology. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: 1 and completion of the quant-

itative prerequisites for the major. May be taken concurrently. The course will concentrate on hypoth-

esis formulation and testing, tests of significance, anal-

ysis of variance (one-way analysis), simple correlation, simple regression, and non-parametric statistics such as chi-square and Mann-Whitney U tests. Majors in-

cluding to be in the honors program must complete 101 by the end of their junior year. (F,SP)

C105. Psychology of African American People: Issues. (3) Three hours of lecture per week. Prerequisites: Africam 5B or 101A, or upper division course in psychology. Examines psychological re-

search and theory pertaining to African American peo-

ple. Emphasis is on understanding the concerns, meth-

ods and conclusions regarding African Americans offered by American psychology from its origins to the present. Also listed as African American Studies C132.

107. Buddhist Psychology. (3) Three hours of lec-

ture per week. Based on tradition of direct observation and experience of ordinary life situations. Provides contrasting perspective to present theories of cognition, perception, motivation, emotion, social in-

teraction, and neurosis.

109. History of Psychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100A-100B. Development of scientific study of human and animal behavior. Consideration of history of par-

ticular subject areas—such as biological, comparative, developmental, personal, and social psychology—as well as general trends.

Biological Psychology

110. Introduction to Biological Psychology. (3) Three hours of lecture per week. Prerequisites: 100A-100B and one hour of discussion per week. Prerequisites: 1 and biological prerequisites for the major or consent of instructor. Survey of relations between behavioral and biological processes. Topics include sensory and perceptual processes, neural mat-

uration, natural bases of motivation, and learning.

111. Sensory Processes: Vision. (3) Four hours of lecture per week. Prerequisites: 110 or consent of the instructor. Examination of various aspects of visual percep-

tion (adaptation, brightness and color vision, binoc-

ular vision, object detection). Prerequisites: all mat-

eral psychology courses.

111L. Laboratory in Vision. (2) Four hours of labor-

atory per week. Prerequisites: Concurrent enrollment in 111 and consent of instructor. Various experiments carried out in visual perception; ob-

servation of physiological studies of single cell re-

sponses.

112. Sensory Processes: Hearing. (3) Two hours of lecture and one hour of discussion per week. Prereg-

erequisites: All courses completed with a grade of "C" or better. Prerequisites: all material psychology courses.

113. Laboratory in Hearing. (2) Two hours of lecture and one hour of discussion per week. Prerequisite:

112 and one hour of discussion per week. Prereq-

erequisites: All courses completed with a grade of "C" or better. Prerequisites: all material psychology courses.

C113. Biological Clocks: Physiology and Behavior. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Completion of biological pre-
requisites for the major and one of the following: 110 or a course in animal organismal behavior (Integrative Biology 132, 140, 148, or Molecular and Cell Biology 160). A consideration of the biological clocks that operate 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 reproductive 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 experimental investigations of the biological substrates of learning, memory and forms of neural plasticity related to the growth and maturation of the nervous system.

115A. Introduction to Comparative Psychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100A or 110, Studies of animal behavior in evolutionary perspective, including analysis of behavior development, reproduction, aggression, territoriality.

115B. Animal Behavior. (4) Students will not receive credit for C115B after taking Integrative Biology 145. Three hours of lecture, one hour of discussion, and one hour of demonstration per week. Prerequisites: Biology 1A-1B or Environmental Science, Policy, and Management 20, 20L, and 40 or 142, 140 recommended. Formerly 115B. An introduction to comparative animal behavior and behavioral physiology in an evolutionary context, including not only cognitive behavior, genetics and development, learning, aggression, reproduction, adaptiveness, and physiological substrates. Two midterm exams and a library term paper. Also listed as Integrative Biology C145A. Offered every other year.

115C. Neuroethology. (3) Three hours of lecture per week. Prerequisites: C115B, Integrative Biology C141C, or consent of instructor. The course will cover a range of topics that span the gap between the properties of individual molecules and complex cognitive behavior, including: the cellular properties of single nerve cells, synapses, pattern generating circuits, sensory and motor integration, sensory processing, escape responses, animal communication, and learning. Also listed as Integrative Biology C147, (SP) Dickinson.

116. 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. Neural and endocrine mechanisms underlying behavior, especially reproduction, of non-human mammals. Process of sexual differentiation of the neuroendocrine system will be emphasized. Functions on feeding, biorythms and aggressive behavior. Also listed as Integrative Biology C143B.

117. Biological Psychology and Problems of Human Dysfunctions. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100A or 110. A survey of contemporary psychological approaches to problems of human disabilities including mental disorders, behavior changes following human brain injury and disease, and mental subnormality. Emphasis on theoretical models of these phenomena and areas of potential application of basic research development.

118. Topical Seminar in Biological Psychology. (3) Course may be repeated for credit with different topic and consent of instructor. Three hours of lecture per week. Consent of instructor. For a precise schedule of courses check with the Student Services Office each semester.

119. Drugs and Behavior. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100A or 110, Studies of animal behavior in evolutionary perspective, including analysis of behavior development, reproduction, aggression, territoriality. agents on complex mental processes such as attention, motivation, learning, and memory. (F,SP)

120. Introduction to Cognitive Psychology. (3) Students will receive no credit for 120A after taking 120B. Two hours of lecture and one hour of discussion per week. Prerequisites: 100A or consent of instructor; 101 recommended. Principl concepts and research concerning human processing of visual, auditory, and symbolic information; objective notation and classification; perception and comprehension of language; attention; theoretical models and experimental techniques in the study of imagery and other cognitive processes.

120B. Basic Issues in Cognitive Science. (4) Students will receive no credit for 100 after taking Psychology 120A. Three hours of lecture and one hour of discussion per week. Formerly 100. Theoretical foundations of current research in cognitive science, and psychology. Particular emphasis will be placed on the nature, implications, and limitations of the computational model of mind. Also listed as Cognitive Science C108, Palmer, Gopnik.

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. Specific topics include learning and memory, sensory perception, neural communication, navigation, 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 or consent of instructor. Formerly 122A. Theoretical and experimental analysis of human learning and memory; short-term and long-term memory; consolidation and transfer and interference; mechanisms of forgetting.

123. Concepts and Categories. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor; 101 recommended. Theoretical constructs and experimental methods in the study of human cognition with particular emphasis on the nature of concepts and categories. Topics will include category structure, prototypes, conceptual organization, meaning, thought, and cross-cultural comparisions.

124. 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 applicability of modern linguistic theory and social psychological aspects of language behavior. Also listed as Cognitive Science C124.

125AC. Second Language Learning and Bilingualism. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Background in linguistics and psychology recommended. Process and structure in second language acquisition, including development of "inter-languages." Processing of linguistic information by bilinguals (perception, recall, translation); factors influencing language maintenance or shift in North America. This course satisfies the American cultures requirement.

126. Perception. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. 101 recommended. An introduction to principal theoretical constructs and experimental procedures in visual and auditory perception. Topics will include psychophysics; perception of color, space, shape, and motion; pattern recognition and perceptual attention. Also listed as Cognitive Science C126.

C127. Cognitive Neuroscience. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Psych 100A or 110 or C120B or Cog Sci C100. This course will examine research investigating how the brain substrates of learning, memory, and, to a lesser extent, the neurosciences literature. included will be the study of brain-injured patients, neuropsychological research in animals, the study of normal cognitive processes in humans with noninvasive neuroimaging and physiologic techniques (e.g., PET scan, brain waves), and others. Topics to be covered include visual perception and object recognition, attention, motor control, language, and development. Also listed as Cognitive Science C127, Ivey.

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.

129. Scientific Approaches to Consciousness. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 1 or Cognitive Science C1, or 120A or C120B or Cognitive Science C100. 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: 100B or consent of instructor; 130 recommended. 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; and subsyndromic conditions such as attention-deficit hyperactivity disorder and conduct disorder; and child abuse and neglect. Psychobiological, familial, legal and societal factors will be emphasized.

131. Developmental Psychopathology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100B or consent of instructor; 130 recommended. 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.

Community Psychology

132. Community Psychology. (4) Two hours of lecture and one and one-half hours of discussion per week. Prerequisites: 100B or consent of instructor; 130 recommended. 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; and subsyndromic conditions such as attention-deficit hyperactivity disorder and conduct disorder; and child abuse and neglect. Psychobiological, familial, legal and societal factors will be emphasized.

132AC. Community Psychology: An American Cultural Perspective. (4) Two hours of lecture and one and one-half hours of discussion per week. Prerequisites: 100B or consent of instructor. Introductions to community psychology with a comparative emphasis on the application of theories of socio-cultural, environmental, and psychological factors that affect the development of mental health, and social/community intervention approaches that prevent problems or provide treatment for populations, organizations, and communities. Theoretical and empirical methods of community psychology as they apply to ethnic-cultural groups: African Americans, Asian Americans, Latinos, Native Americans, United States, and European Americans. Students participate in community-based action research projects. This course satisfies the American cultures requirement.

134AC. Psychological Perspectives on Cultural, Racial, and Ethnic Diversity. (3) Two hours of lecture
and one and one-half hours of discussion or special speaker series per week. This course will address various topics in psychology that bear upon race, ethnicity, and culture, including (1) the cultural specificity of cognitive processes, (2) cultural variation in personality development; (3) ethnic identity and biracial identity; (4) the psychological sequelae of immigration; (5) the psychology of ethnic and racial prejudice; and (6) psychological processes for promoting interventions with culturally diverse and ethnic minority populations. The course aims to increase understanding of race, culture, and ethnic identity through applying psychological perspectives, and to sensitize students to the subjective experience of minority group members. This course satisfies the American cultures requirement.

C137. Asian Americans: Cultural, Psychological, and Social Work Perspectives. (2) Two hours of lecture and one hour of discussion per week. Course provides an overview of the Asian American experience from a psychological perspective. Examines Asian American cultural values, the process of psychological adaptation to a new cultural environment, and implications for social work practice, and culturally sensitive service delivery and treatment. Also listed as Social Welfare C151.

138. Topical Seminars in Clinical Psychology. (3) Course may be repeated for credit with different topic and consent of instructor. Three hours involved per week. Prerequisites: 100B or 130 or consent of instructor. For a precise schedule of offerings check with the Student Services Office each semester.

Developmental Psychology

140. Developmental Psychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100B or 130 or consent of instructor. For a precise schedule of offerings check with the Student Services Office each semester.

141. Development During Infancy. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100A or 140. Cognitive, perceptual, and social development during the first two years of life with emphasis upon methods of observation and experimentation.

142. Cognitive Development. (3) Two hours of lecture and one hour of discussion per week. Theory and research on intellectual growth from birth through adulthood with special attention to the development of logical and physical concepts.

146. Developmental and Biological Processes in Attachment. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100A or 110 or consent of instructor. This course provides the integrating approach to the topic of human and subhuman precursors to attachment. Presentation of conceptual and empirical advances investigating the organization and development of infant-mother attachments. Recent advances in our understanding of representational (cognitive) aspects of individual differences in human attachment are stressed.

148. Topical Seminars in Developmental Psychodynamics. (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.

149. Topical Laboratories in Developmental Psychology. (3) Course may be repeated for credit with different topic and consent of instructor. Two hours of lecture and three hours of laboratory 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: 100B or consent of instructor. For a precise schedule of offerings check with Student Services Office each semester.

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151. Assessment of Personality. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 100B or 150 and consent of instructor. Theoretical and practical issues in the assessment of personality; observational procedures; the interview; problems of test interpretation and psychodiagnosis; demonstrations and exercises in the methods of personality assessment.

155. Personality Research and Assessment. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100B (maybe taken concurrently). This course focuses on the empirical study of key issues in personality psychology. We will examine the research literature in such areas as the measurement of personality traits, personality assessment and its application to personnel selection, and social problems of test interpretation and psychodiagnosis; demonstrations and exercises in the methods of personality assessment.

158. Topical Seminars in Personality. (3) Course may be repeated for credit with different topic 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 general social psychological processes, small groups, attitudes and attitude change, and social problems.

161. Interpersonal Processes. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100B or 160 or consent of instructor. Theory and research in interpersonal processes, including topics such as aggression, altruism, attribution, and conformity.

162. Attitudes, Beliefs, and Influence Processes. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 100B or 160 or consent of instructor. Theory and research in the development and dynamics of attitudes and beliefs, theories of attitude change, and experiments or field studies concerning attitudes and attitude change.

164. Social Cognition. (3) Three hours of lecture per week. Prerequisites: 120A or 120B; 100A or 150 or 160. Surveys empirical and theoretical approaches to our understanding of perception, memory, thought, and language concerning ourselves, other people, inter-personal behavior, and the situations in which social interaction takes place. Emphasis is placed on the integration of psychological and cultural processes with the concepts and principles employed in the study of nonsocial cognition.

165. Language in Social Interaction. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 120A or 120B. Course provides an overview of the psychology of language concerning ourselves, and others; how our speech is affected by linguistic, social, personal behavior, and the situations in which social interaction takes place. Emphasis is placed on the integration of psychological and cultural processes with the concepts and principles employed in the study of nonsocial cognition.

166AC. Cultural Psychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100B is recommended (may be taken concurrently). The course will review research on culture, race, and ethnicity and will consider the implications of these findings for our understanding of race, culture, and ethnicity in American society. Mounting evidence suggests that psychological processes are culture-specific, theory-driven, and context-dependent. This will be the focus of the course. We will focus on the question of what, in any context, is the result of mind, person, self, and social institutions have on human cognition, motivation, emotion, and social interactions in American society. Students will gain a better appreciation of the ways that cultural traditions and social practices regulate and transform psychological functioning. Simply, the course is about how culture affects psyche and how psyche affects culture. This course satisfies the American cultures requirement.

Industrial-Organizational Psychology

180. Industrial-Organizational Psychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100B or consent of instructor. Primarily for majors. Introduction to the field of industrial psychology, covering fundamental theory and concepts in personnel and social aspects in the field. Concerned with how psychological contributions are involved in developing and maintaining organizations.

182. Personnel Psychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100B or 180 or consent of instructor. Emphasis on psychological contributions in the development of techniques and practices in personnel selection and development.

Special Course Offerings

190. Cluster Seminar. (1) Two hours of seminar per week. Prerequisites: Psychology major and admission to the Cluster Program. Should be taken on a pass/fail basis. Prerequisites: Psychology major and admission to the Cluster Program. Should be taken on a pass/fail basis.

C191. Office of the Future. (3) Three hours of lecture per week. Prerequisites: Upper division standing. Conventional office design will undoubtedly change, primarily in response to concerns about productivity and health. How can research, especially psychological research, help us improve the design of offices? What should offices look like 10-50 years from now? How will office design change? The course will attempt to answer these questions. Course will be repeated for credit. Individual conferences. Must be taken on a pass/fail basis. Prerequisites: Open only to senior psychology majors in the honors program. H195A-H195B should be taken concurrently. In the fall semester the course will concentrate on issues of research design, ethics, and data analysis using statistical packages. The spring seminar will focus on oral and written presentations on thesis projects and feedback on thesis drafts. (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. Credit and grade to be awarded on completion of sequence. Prerequisites: Open only to senior psychology majors in the Honors Program. Independent 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. Independent study. Must be taken on a pass/not passed 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/or group meetings with faculty. Enrollment is restricted by regulations of the Berkeley Division listed elsewhere in this catalog. (F,SP)
198. Directed Group Study. (1-3) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Group study of a selected topic or topics in psychology. Enrollment is restricted by regulations of the Berkeley Division listed elsewhere in this catalog. (F,SP)

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Enrollment is restricted by regulations of the Berkeley Division listed elsewhere in this catalog. (F,SP)

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 adviser and consent of the instructor.) Courses beginning each decade are designated as Save for second-year grad- uate students in psychology.

Quantitative Psychology
201A-210B. Design and Analysis of Psychology Experiments. (3,3) Three hours of lecture per week. Design and statistical analysis of psychology experiments. Prerequisites: Graduate standing, basic course in animal behavior, and consent of instructor. (3,3) Three hours of lecture per week. Permission of instructor. (F,SP)

210A-210B. Data Analysis. (3,3) Three hours of lec- ture and two hours of discussion/laboratory per week. Students will need to work through problems (home- work). A general data analytic course that emphasizes design issues and problems, from pure experimental research through field studies. Techniques of ANOVA and multivariate analysis will be presented as analytical models for both lab and field research.

Biological Psychology
210A-210D. Graduate Survey of Biological Psy- chology. (3,3) Three hours of lecture per week. Prerequisites: Consent of instructor. A four-semester/year survey of the field of biological psychology. All four semesters are required for all graduate students in bi- ological psychology, but graduate students may take any of the semesters for credit. The areas covered by each course are (a) human cognitive neuroscience; (b) animal behavior, behavioral endocrinology, and bi- ological rhythms, and (c) learning. One course is available each semester. Graduate stu- dents in biological psychology are required to complete all four semesters in the first two years of study.

211. Hormones and Behavior. (3) Three hours of lecture per week. Prerequisites: 210A-210B. A con- sideration of the influence of hormones on reproduc- tive behaviors, including emphasis on the process of sexual differentiation. Discussions of parental behav- ior, seasonal reproduction and hormonal involvement in non-reproductive processes, including eating, social behavior, learning and memory. Emphasis on mam- mal.


C216A. Spatial Aspects of Vision. (2) Course may be repeated for credit with consent of instructor. Two hours of lec- ture per week. Prerequisites: Prerequisite: Consent of instructor. Selected topics from recent literature: Visual direction, egocentric and oculocentric localization. Par- tern vision. Feature detector and spatial frequency fil- ter models. Local and global frequency analysis, visual acuity and relation to contrast sensitivity. Spatial as- pects of color vision. Also listed as Vision Science C218.

C216B. Color Vision. (2) Course may be repeated for credit with consent of instructor. Two hours of lec- ture per week. Prerequisites: Prerequisite: Consent of instructor. Selected topics from recent literature: Visual direction, egocentric and oculocentric localization. Par- tern vision. Feature detector and spatial frequency fil- ter models. Local and global frequency analysis, visual acuity and relation to contrast sensitivity. Spatial as- pects of color vision. Also listed as Vision Science C218.

217. Drugs and Behavior. (3) Three hours of lecture per week. Prerequisites: 210A-210B. This course at- tempts to explain how drugs influence behavior. Prin- ciples of pharmacology, cytology of nerve cells, neu- rophysiological mechanisms and synaptic functions are emphasized. The anatomy, neurochemistry and phar- macology of the nervous system are reviewed. (3) Three hours of lecture per week. Prerequisites: Prerequisite: Consent of instructor. The actions of drugs on psychopathological conditions will be studied. Finally the course will focus on the ef- fects of drugs on complex behaviors such as motiva- tion, cognition, learning and memory.

218. Issues in Cognitive Neuroscience. (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. Discussion of recent papers on the comparative and physiological study of learning and cognition.

219. Biological Seminar. (1) Course may be re- peated for credit. One and one-half hours of seminar per week. Must be taken on a satisfactory/unsatis- factory basis. Prerequisites: Graduate standing or con- sent of instructor. Reports and discussions of original research in the area of biological psychology. Not all participants need report in any given semester, but all are expected to attend and to enter into the discus- sions. Required course for all students in the biological graduate program. (F,SP)

Cognitive Psychology
220A. Proseminar: Cognition. (3) Three hours of lecture per week. Prerequisites: Theoretical neuroscience and experi- mental methods in the study of human cognition with particular emphasis on the nature of concepts and cat- egories. Topics will include category structure, prototype, conceptual organization, meaning, thought, and cross-cultural comparisons.


220C. Proseminar: Human Learning and Memory. (3) Three hours of lecture per week. Theoretical and experimental analysis of human learning, transfer, and memory. Stress will be given to the learning and re- viewment of verbal materials.

C220D. Proseminar: Problem Solving and Under- standing. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Students will exam- ine problem solving in children and adults, from a cognitive science perspective, and will apply this framework with an examination of thinking involved in diverse problem types. Students will then analyze the literature concerning cognitive issues that transcend problem types—categorizing representation, “understanding,” ac- cess and availability of knowledge. Consideration of one’s own cognitive processing, categorization, the archi- tecture of knowledge, and the control of cognition. Also listed as Education C229A.

220E. Proseminar: Perception. (3) Three hours of lecture per week. Prerequisites: Permission of instructor. Course may be repeated for credit with consent of instructor. This course will consist of an introduction to cognitive science at the graduate level. Course will have a high emphasis on topics in perception, reasoning, decision-making and learning, from the perspectives of different disciplines. Also listed as Cognitive Science C220.

220G. Proseminar: Judgment and Decision Mak- ing. (3) Three hours of lecture per week. This course will explore the nature of how people make decisions, choices, decisions, and evaluations. Descriptive models will be compared to rational models of beliefs and actions. Topics will include probability, assessment, attitudes to- ward risk, multi-attribute judgment for contextual effects, and theories of prediction and choice.

220H. Proseminar: Concepts and Categories. (3) Three hours of lecture per week. This course will look at some of the basic issues in categorization that have been the focus of psychological research: the classi- cal view of categories (defining features) versus graded structure/prototype views; the idea of basic cat- egories (its proliferation of implications); catego- rization in life events; the role of studies as categories; categories viewed as theories; develop- mental issues in categorization; and the relationship between categorization and language.

229. Cognitive Seminar. (1) Course may be re- peated for credit. One and one-hour lecture per week. Must be taken on a satisfactory/unsatis- factory basis. Prerequisites: Graduate standing or con- sent of instructor. Reports and discussions of original research in the area of cognitive psychology. Not all participants need report in any given semester, but all are expected to attend and to enter into the discus- sions. Required course for all students in the cognitive graduate program. (F,SP)

Clinical Psychology
230A-230B. Proseminar: Clinical Psychology. (3,3) Three hours of lecture per week. Formerly 230. Ex- amination 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 re- search, and emerging professional roles and institu- tions. Fall semester will focus on the development of the basic theoretical domain of clinical psychology, and spring will focus on the relationship between psychopathology and normal mental health and community/prevention.

231B. Clinical Neuropsychology. (3) Three hours of lecture per week. Survey of clinical neuropsychology, including foundational issues in the field of neuropsy- chology, pertinent research, and applications to clini- cal cases. (F,SP) Staff

231D. Minority Mental Health. (3) Three hours of lec- ture per week. Overview of concepts and research in understanding and contributing to the solution of the particular mental health problems of ethnic minority communities.

Clinical Psychology
231E. Expectations and the Prevention of School Failure. (3) Three hours of lecture per week. Exam- ination of the theory and research on expectancy pro- cesses in the classroom and in schooling, with par-
tic focus on classroom and school practices which enhance the social processes of instruction and promote the development of competence in children.

232. Cognitive, Behavioral, and Emotional Assessment of Children. (3) Three hours of lecture per week. This course will feature theoretical and clinical issues pertinent to the assessment of children. Topics to be covered include the nature of intelligence and controversies in IQ testing, the use of checklists and structured interviews related to behavioral and psychological evaluation, and self-report instruments related to internalizing disorders (e.g., anxiety, depression). Graduate students in clinical psychology will receive first priority for course enrollment.

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 and 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.

234A. Contemporary Psychoanalytic Theory. (3) Three hours of lecture per week. Contrast and evaluation of various models of contemporary psychoanalytic theory and their specific basic theories of mind, motivation and behavior are understood, how change in symptoms or personality can be brought about, and the relation of theory to clinical technique. Consideration of the scientific status of clinical construct and attempts to verify the through an empirical method.

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. (F,SP) Staff

234C. Theories of Community Intervention. (3) Three hours of lecture per week. Three hours of seminar per week. Prerequisites: Limited to second and third-year students. Faculty to graduate students having an interest in their field. Each week, attention is directed to the work of a different faculty member associated with the personality faculty. Must be taken on a satisfactory/unsatisfactory basis. (F,SP) Staff

235. Clinical Research. (3) Three hours of lecture per week. Examination of the methods, findings, and empirical advancements in the diagnosis and treatment of neuropsychiatric and affective disorders. (F,SP) Staff

237. Intervention: Assessment. (1) Course may be repeated for credit. One hour of lecture per week. Prerequisites: Limited to clinical psychology students or consent of instructor. Psychological assessment of children and adults. (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. Issues in decisions about providing psychological services to individuals, families, and groups in social systems. (F,SP)

237F. Intervention: Couples Therapy. (1) Course may be repeated for credit. Two hours of seminar 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 hour of lecture per week. Prerequisites: Limited to second- and third-year clinical psychology students or consent of instructor. Psychological services to individuals, families, and small groups. (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 areas 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

C240A. Proseminar: Biological and Perceptual Development. (3) Three hours of lecture per week. Survey of the biology of the nervous system and behavior; the cellular interaction and development in animals and humans, including neurogenesis, synaptogenesis, cell death and synapse elimination; perceptual development, including development of the eye and ear, of the central visual and auditory pathways, and of visual and auditory perception; and the genetic and experiential determinants of neural and perceptual development. Also listed as Vision Science C240. (F,SP)

C240B. Proseminar: Emotional, Social and Psychological Development. (3) Three hours of lecture per week. Current theory and research on the origins and maintenance of normal and pathological socioemotional development in infancy. Exploration of biological, psychological, and social factors. (F,SP)

240C. Proseminar: Cognitive Development. (3) Three hours of lecture per week. Theory, research, and methods of the processes and structures of intellectual growth from birth to adulthood.

240D. Proseminar: Language Development. (3) Three hours of lecture per week. Child language development within the logical and methodological framework of psycholinguistics. Review of phonological, grammatical, semantic, and sociolinguistic development, considered in relation to developmental models.

249. Developmental 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 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 perspective and research design. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Limited to graduate students having an interest in the field. Each week, attention is directed to the work of a different faculty member associated with the personality faculty. (F,SP)

250B. Perspectives in Personality: Trends and Issues. (3) 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 nonsocial cognition. (F,SP)

250D. Principles and Pragmatics of Personality Measurement. (3) Three hours of lecture per week. Surveys personality measurement, with particular attention to the qualities, attributes, talents and dispositions considered in the everyday evaluations people make of self and others. (F,SP)

2520E. Perspectives in Personality: Personality Theory. (2) Two hours of seminar per week. Major approaches to personality theory, including psychoanalytic, dynamic, behavioral, psychometric, and humanistic theory, as well as work in culture and personality, the study of lives, and feminist psychology. Analysis of research regarding 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 Psychology C2520H.

251A-251B. Personality Assessment. (5,5) Three hours of lecture and three to five hours of laboratory per week. Prerequisites: Ph.D. candidate in personality psychology or consent of instructor. Lectures and laboratory work on personality assessment, including the theoretical background of assessment and the design of an assessment program, conducting an assessment, and case conferences, preparation of research reports, and methods of data analysis. (F,SP)

259. Personality 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 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

260A-260B. Proseminar Course in Social Psychology. (3,3) 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 psychology graduate program.

261. Research Methods in Social Psychology. (3) Three hours of lecture per week. Survey of various research methods and methodologies employed for studying human social behavior, including experiments, quasi-experiments, self-report methods, and content analysis. Required course for all students in the social psychology graduate program.  

*Professor of the Graduate School  
Recipient of Distinguished Teaching Award

B prefix=language course for business majors  
C prefix=cross-listed course  
G prefix=course satisfies R&requirement  
H prefix=honors course  
AC suffix=course satisfies American cultures requirement
Public Health
(Graduate School of Public Health)

Office: 19 Earl Warren Hall, (510) 642-6531
Dean: Edward Penhoet, Ph.D.
Associate Deans:
Cheri A. Pies, M.S.W., Dr.P.H.
William Satyanarayan, M.P.H., Ph.D.
Teh-Wei Hu, Ph.D.

Professors
Gladys Block, Ph.D. Johns Hopkins University. Nutrition and cancer prevention, vitamin D.
Jean R. Bloom, Ph.D. University of California, Design and evaluation of community health programs.
William Thomas, Ph.D. Environmental Health Sciences. Social and behavioral epidemiology, developmental psychobiology.
Patricia M. Butler, Ph.D. University of California, Berkeley. Cancer epidemiology.
Ralph A. Catalano, Ph.D. Syracuse University. Economic and social stresses on the health of populations.
Leonard J. Duhi, M.D. Albany Medical College. Health and healing, social policy.
Brenda Eisenkraft, Ph.D. City University of New York. Human behavioral toxicology/teratology, neuropsychology, perinatal epidemiology.
Richard G.A. Feachem, Ph.D. University of New South Wales, International health policy and public health.
Paul J. Gerster, Ph.D. University of Wisconsin. Economics and finance of health and health care markets, both domestic and international.
Jeffrey B. Gould, M.D. University of Rochester. Epidemiology of pregnancy outcome, interventions to improve pregnancy outcomes.
S. Katherine Hammond, Ph.D. Brandeis University.
Exposure assessment for occupational and environmental health studies.
Teh-Wei Hu, Ph.D. University of Wisconsin. Techniques in health economy to specific program evaluation and policy analysis.
Nicholas F. Jewell, Ph.D. University of Edinburgh. Biostatistics and applications of statistical methods.
Catherine P. Koshland, Ph.D. Stanford University. In vitro and in vivo interactions of organic species and metals; development of in situ diagnostics for detection of trace organs and inorganic materials.
Meridith A. Minckler, Dr. Ph. University of California, Berkeley. Social support and health, health policy for the aging.
Daniel Putnam, Ph.D. University of Washington. Micronutrient deficiencies, iron deficiency anemia.
Arthur L. Reingold, M.D. University of Chicago. Epidemiology of infectious diseases, control of diseases in foreign countries.
Legor L. Rowley, M.D. University of California, San Francisco. Tuberculosis, enteric infections, bacterial pathogenesis.
James C. Robinson, Ph.D. University of California, Berkeley. Occupational/environmental health policy, organization and economics.
Thomas G. Rundall, Ph.D. Stanford University. Relationship of social factors to health behavior, health status, and the use of services.
William A. Satyanarayan, Ph.D. Purdue University. Aging, social epidemiology.
Helen H. Schaffner, Ph.D. Brandeis University. Health care and medical care policy and politics.

Adjunct Professors
Richard M. Scheffler, Ph.D. New York University. Health economics, the impact of financing on healthcare delivery.
S. Selvin, Ph.D. University of California, Berkeley. Application of data analysis and graphical methods to environmental and epidemiological problems.
K. R. Smith, Ph.D. University of California, Berkeley. Application of risk assessment techniques to energy and environmental policy and public health.
Martyn E. Smith, Ph.D. St. Bartholomew's Hospital Medical College (London). Occupational health to developing countries.
Richard S. Stephens, Ph.D. University of Washington, Seattle. Molecular and epidemiology studies of Chlamydia, the role of tachyzoites in host-parasite interaction.
Ira S. Tager, M.D. University of Rochester. Pulmonary epidemiology, infectious diseases, and aging.
Mark J. van der Laan, Ph.D. University of Utrecht (The Netherlands). Statistical methods for cancer research in computer science.
Edward T. Wei, Ph.D. University of California, San Francisco. Toxicology of airborne materials.
Henrik L. Blum, M.D., M.P.H (Emeritus) Epidemiology.
Chin Long Chang, Ph.D. (Emeritus) Epidemiology.
Robert C. Cooper, Ph.D. (Emeritus) Epidemiology.
Carole N. D'Onofrio, Dr. P.H. (Emeritus) Epidemiology.
Sidney S. Elberg, Ph.D., L.H.D., h.c. (Emeritus) Epidemiology.
Frank Falkner, M.F. R.C.P. (Emeritus) Epidemiology.
Donald Heyneman, Ph.D. (Emeritus) Epidemiology.
Joyce C. Lashof, M.D. (Emeritus) Epidemiology.
Sheldon Margen, M.D. (Emeritus) Epidemiology.
Donald Minkler, M.D. (Emeritus) Epidemiology.
Mary M. Murray, M.S.P.H., M.S. (Emeritus) Epidemiology.
William J. Ciszek, Ph.D. (Emeritus) Epidemiology.
Alanna Parker, M.P.H. (Emeritus) Epidemiology.
Octavio I. Roman, Ph.D. (Emeritus) Epidemiology.
Leonora Shapiro, D.P.H. (Emeritus) Epidemiology.
David B. Starkweather, Dr. P.H. (Emeritus) Epidemiology.
Ruth Simmons, M.P.H. (Emeritus) Epidemiology.
Helen M. Wallace, M.D. (Emeritus) Epidemiology.
Lawrence Wallace, Dr.P.H., H.P.M. (Emeritus) Epidemiology.

Associate Professors
Barbara F. Abrams, Dr.P.H. University of California, Berkeley. Nutritional epidemiology, dietary methodology, maternal and child nutrition.
Gertrude Case Buehring, Ph.D. University of California, Berkeley. Epidemiology and prevention of breast cancer; viruses and human cancer.
Sylvia Gendelman, Ph.D. University of California, Berkeley. Social and cross-cultural issues in migration and health, child health, and the role of primary care, international health of mothers and children.
Dana A. Henderson, Ph.D. University of California, Berkeley. Influenza, role of bacterial factors on the health of African Americans.
Pattie A. Morgan, Ph.D. University of California, Santa Barbara. Social policy in the control and treatment of psychosomatic subsystems, policies and programmatic shifts in mental health.

Assistant Professors
Ying Qing Chen, Johns Hopkins University. Survival analysis, longitudinal data analysis, clinical trials.
John (Jack) M. Colford, Jr., Ph.D. University of California, Berkeley. Epidemiology of infectious diseases, including AIDS, cryptosporidiosis, and the public health effects of smoking, tobacco control, and emerging infectious diseases.
Jodi Halpern, Ph.D. Yale University. Ethical and philosophical foundations of health care.
Eva Harris, Ph.D. University of California, Berkeley. Pathogenesis of dengue virus and leishmaniasis: molecular epidemiology of infectious diseases and sustainable technology transfer.
Yi-Fu Lin, Ph.D. University of Chicago. Biology of human herpes viruses, nucleic acid biochemistry.

Adjunct Professors
Genevieve Ames, Ph.D. Behavioral Science.
John J. (Jack) Lifson, M.D. Epidemiology.
Thomas L. McKone, Ph.D. Environmental Health Sciences.
V. N. Neuberger, M.D. Epidemiology.
J. Schaffner, Ph.D. Epidemiology.
B. A. Parker, M.P.H. Epidemiology.
D. P. Rank, M.D. Epidemiology.
D. P. Rank, M.D. Epidemiology.
E. S. Selvin, Ph.D. Epidemiology.
J. N. Sather, M.D. Epidemiology.
J. N. Sather, M.D. Epidemiology.
J. N. Sather, M.D. Epidemiology.
J. N. Sather, M.D. Epidemiology.
Overview

The mission of the School of Public Health (SPH) is to develop and apply knowledge from multiple disciplines for the promotion and protection of the health of the human population, giving due consideration to principles of human rights and cultural perspectives that abound in our multicultural country and world. The school carries out this mission with programs of teaching, research, and service. Through integration in an understanding of the theory and mechanisms of the basic sciences, are integrated through a focus on communities that reach from the neighborhoods surrounding the campus to international settings.

Promotion and protection of the health of human populations require a scientific understanding of epidemiology, biostatistics, and the biological, physical, environmental, social, behavioral, informational, and administrative and policy sciences.

In the School of Public Health, these and other disciplines focus on health problems of particular populations, selected diseases or disabilities, and issues associated with the application of resources to public health systems. SPH faculty, support resources, and curricula focus on both the fundamental disciplines and their applications to particular situations. Within the University and wider community, faculty strive to advance the understanding of the fundamental disciplines, apply them to problems faced by human populations, and propose the integration of a context in which future public health practitioners and scholars may develop needed skills and capacities.

The program of study leading to the professional M.P.H. degree is based on a comprehensive body of knowledge in the field of public health and its related disciplines, and the investigation of significant problems in public health practice.

Programs of study leading to the following academic degrees are administered by groups of faculty within the School of Public Health and other departments:

- Biostatistics—M.A., Ph.D.
- Environmental Health Sciences—M.S., M.P.H., Ph.D.
- Epidemiology—M.S., Ph.D.
- Genetic Counseling—M.S.
- Health Services and Policy Analysis—Ph.D.
- Infectious Diseases and Immunology—Ph.D.
- Joint Medical Program—M.S.

Applications for admission to the School of Public Health are accepted for the fall semester only because of the sequenced nature of courses. Both the School of Public Health and the Graduate Division require a separate set of application materials. All applicants should return all their application documents (both School of Public Health and Graduate Division) in one packet to Student Services and Admissions, School of Public Health, The deadline is December 1. That deadline also applies to fellowships, assistantships, and internships.

For further information about the School of Public Health, visit the school’s home page at http://socrates.berkeley.edu/~sph or visit or write the Dean of Students, socrates.berkeley.edu. Appendix H lists the SPH’s current faculty, staff, and resellers.

Departmental courses are organized into the following categories:

- Lower Division Courses
- Upper Division Courses
- Special Studies
- Directed Group Study
- Directed Individual Study
- Field Study
- Internship
- Independent Study
- Independent Research
- Independent Thesis
- Laboratory
- Study Abroad
- Supervised Experience
- Work-Study

Public Health / 393
process of understanding the interconnectedness between personal health and the larger context of society and the impact to community. Classes will cover the principles of public health and social justice, health-promotion and wellness, cultural, recent public health issues, community health issues, diversity and oppression theories. Students are expected to participate in a community-oriented project of their own choosing. The goal of the course is to provide students with the skills to deliver comprehensive health care through service learning activities, which will further reinforce the connections between personal health and public health issues. (F) Rincon

114. Issues in Personal and Community Health Promotion (3) Three hours of lecture and one hour of discussion per week. Introduction to trends and issues in the educational approach to health promotion at the individual and community levels. Presentation of basic information on selected topics (i.e., stress, sexuality, fitness, alcohol and drugs, environmental health), with emphasis on the social and political factors that influence both the definition of health and actual health status. (SP) Griego

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 perspective. 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 shape and determine the health and well-being of the elderly and their access to and use of health care programs and policies. The elderly will be examined in sociohistorical perspective with attention to their salience in a multicultural society. The course will be offered under the graduate (upper division) level to meet the American Cultures requirement, but is also 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) Minkler

131AC. Race, Ethnicity, and Health in America. (3) Three hours of lecture per week. Race, Ethnicity, and Health in America 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 group, this course will allow students to fully appreciate the distinct contributions of each group. This course satisfies the American cultures culture requirement. (SP) Griego

140. Introduction to Risk and Demographic Statistics. (4) Four hours of lecture and one hour of discussion 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. Computerized systems and the analysis of mass data. (F) Tarter

142A. Introduction to Probability and Statistics in Biology and Public Health. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: Physics 7A. Formerly 142. High school algebra. Descriptive statistics, probability, probability distributions, point and interval estimation, hypothesis testing, chi-square, correlation and regression with biomedical applications. (F) Selvin

142B. Introduction to Probability and Statistics in Biology and Public Health. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 142A or equivalent. Regression, analysis of variance, bioassy, analysis of covariance, design of experiments, and nonparametric analysis with biomedical applications. (SP) Lahit

150A. Introduction to Epidemiology. (2) Two hours of lecture and one hour of discussion per week. Formerly 150. This course introduces principles of epidemiology in the context of critically interpreting studies of intervention and prevention. Emphasis on research design, addressing the design, implementation, analysis, and interpretation of epidemiological studies are covered, including observational and experimental methods, study group selection, exposure and outcome measurement, and interpretation of associations. (SP) Abrams

150B. Introduction to Environmental Health. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: Background in biological sciences and a course in biostatistics required or consent of instructor. Formerly second half of 150. The course will present the major human and natural activities that lead to release of hazardous materials into the environment as well as the causal links between chemical, physical, and biological processes, and the environment and their impact on human health. The basic principles of toxicology will be presented including dose-response relationships, absorption, distribution, metabolism, and excretion of chemical agents and the overall role of environmental risks in the pattern of human disease, both nationally and internationally, will be covered. The engineering and policy strategies, including risk assessment, used to evaluate and control these risks will be introduced. (SP) K. Smith, M. Smith

150C. Introduction to Public Health Biology. (2) Two hours of lecture per week. The biology of health and disease taught from an evolutionary perspective. Topics include the biologic basis of human heredity, aging, immunology, mental health, behavioral patterns, nutrition, and infections. The applications of biology to disease prevention will be emphasized. (F) Boyce, Buehnig, Crawford, Potts, Rile, Sensabaugh

150D. Introduction to Health Policy and Management. (2) Two hours of lecture per week. Prerequisites: Not required for HPM students. This course is intended to introduce students to health policy-making and health care organizations in the United States. Students will be introduced to concepts from public policy, economics, organizational behavior, and political science. Students will also be introduced to current issues in U.S. health policy and the present organizational structures within the health care system. This course of study is not designed to provide students with the policy analysis or management tools necessary to manage the provision of public health or medical care services. Further course work in HPM is necessary to develop these skills. (F) Catalano

150E. Introduction to Social and Behavioral Health. (2) Two hours of lecture per week. This course introduces students to the principal contributions of the social sciences to public health. These contributions include insights into behavior of individuals and institutions as well as into the processes by which we assign risks for illness and resources for prevention. The course surveys the major contributions of psychology, economics, sociology, anthropology, and political science to public health. The material is conveyed in lectures and optional discussion sections. (SP) Satariano

162A. Public Health Microbiology. (3) Three hours of lecture per week. Prerequisites: One year each 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) Buehnig, Danielson, Tempelis

162L. Public Health Microbiology Laboratory. (1) Two hours of laboratory per week. Prerequisites: One year each of college-level biology and chemistry. Laboratory to accompany 162A. Must be taken concurrently with 162A. (F) Liu

170B. Toxicology. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Introduction to toxicology covering basic principles. Topics include chemical mechanisms, metabolism, mechanisms of toxicity, carcinogenesis, interpretation of toxicological data for risk assessment, and target organ toxicity. (F) M. Smith

171. Air Pollution. (3) Three hours of lecture per week. Prerequisites: Chemistry 1A, Mathematics 1B, Physics 7A. Formerly 171. An introduction to the technology of air pollution dealing with air pollutants, effects, sources, combustion processes, control technology and abatement. (F) Staff

C171. Environmental Engineering: Air Pollution. (3) Three hours of lecture per week. Prerequisites: Chemistry 1A, Mathematics 1B, Physics 7A. Formerly 171. An introduction to the technology of air pollution dealing with air pollutants, effects, sources, combustion processes, control technology and abatement. Sponsoring departments: Civil and Environmental Engineering, (SP) M. Smith

171C. Toxicology II. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Advanced issues in modern-day toxicology including molecular aspects of chemical carcinogenesis, genetic toxicology, toxic effects on the immune, reproductive, and other organ systems. (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 action and toxicology. Brief survey of major groups of chemicals used in therapy. (SP) Wei

180. Topics in Human Sexuality. (2) Two hours of seminar per week. This course is built around an evolutionary perspective on 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, sociology, anthropology, physiology, psychology, economics, and history to explore the richness of human sexual behavior and reproduction and the interaction between our biology and our culture. (SP) Potts

182. Make War, Not Love: The Biology and History of Human Warfare. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. The course will contrast the biosocial and standard social science paradigm covering human warfare. It will outline the history of land warfare from the Civil War to Vietnam. It will outline recent observations on the behavior of the great apes that may illuminate the human predisposition to raids and warfare. The course invites student participation. (SP) Potts

198. Field Study in Public Health. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing. Supervised experience relevant to specific aspects of public health in off-campus organizations. Regular in-person meetings with faculty sponsor and written reports required. (F,SP) Staff

198E. Directed Group Study. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing. (F,SP) Staff

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. (F,SP) Staff

Graduate Courses

200. Overview of Public Health. (2) Four hours of lecture for seven and one-half weeks. Prerequisites: Graduate standing in public health. This course provides an introduction to basic issues in public health. Various sections of the course address the mission of public health, fundamental value conflicts regarding public health in American society, social and behavioral determinants of health status, various approaches to health promotion and disease prevention, and the development of healthy public policies. The course has a primary focus on the United States, with limited attention to other industrialized and non-industrialized countries. (F) Catalano

200A. Current Issues in Public Health Ethics: Research and Practice. (2) Two hours of lecture per week. Prerequisites: Graduate standing. An analysis of the on-going ethical issues in public health research and practice, e.g., informed consent, privacy and con-
200B. Conceptual Dilemmas in Public Health and Medicine. (2) Two hours of lecture per week. This course addresses a series of major conceptual dilemmas confront both public health and medicine in studying health and disease. While many of these dilemmas form a largely unseen "background" in the health sciences, each is an integral part of the theoretical foundation brought to epidemiologic studies. Readings are drawn from the epidemiologic, biostatistical, and anthropological literature. Topics include problems in assigning causation; definitions of disease and disorder; mind and body; evolutionary biology and the health sciences; historical and philosophical issues, the role of the press in communicating health information; and the nature of suffering and the goals of public health and medicine. Also listed as Health and Medical Sciences C271. (F) Bicou, Reingold

201A. Social and Cultural Perspectives in Public Health. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Using social and cultural theories for analyzing public health problems in America is the purpose of this course. The course has three objectives: to familiarize students with the use and social cultural theories for analyzing public health problems; second, to increase understanding about how social and cultural aspects of the population impact the perception, occurrence, and response to public health issues and problems; and, third, to demonstrate how each public health professional can benefit from social science knowledge development related to their practice or research interests. (SP) Morgan

201C. Health, Behavior, and the Family. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. A critical discussion of recent developments in health-relevant psychological theories as they relate to the implementation, design, and evaluation of programs designed to improve the health status of designated groups. (SP) Satariano

201E. Public Health Interventions: Theory, Practice, 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 determine the interventions that promote health. Students examine the determinants of health and the history, types, ethics, and approaches of public health interventions. Community level interventions, environmental, policy, and other approaches receive special emphasis. The course stresses a rigorous critique of the outcomes and practical ways to improve them. Students take an active role in the design and conduct of the course. (SP) Neuhauser, Syme

202A. Social Movements and Public Health. (3) Two hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. An examination of major theories of social movements and their application to public health including resource mobilization theory and new social movement theory. Case studies from public health movements such as organized health community for AIDS healthcare resources, movements related to reproductive issues, alcohol and drugs, and self-help will be explored to assess relevance of social science theory. (F) Herd

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 health behavior as a basis for public health programs. Consideration of U.S. ethnic minority groups and cultural values in third world societies. Health status and behavior examined in context of relevant social and anthropological theory (social class, acculturation, political economy). Influence of socio-cultural background on the concept of risk and the expression of behavior. Implications for planning public health programs and policies. (SP) Herd

202C. Substance Abuse Prevention. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Patterns of use and social responses to alcohol, tobacco, and other psychoactive drugs and interrelations in use and social response. Attention is given to the growth of community treatment systems and to preventive strategies and their effectiveness. (SP) Staff

202E. Violence Prevention: Community-Based Public Health. (3) Course may be repeated for credit. Two hours of lecture and one and one-half hours of discussion per week. An overview of violence as a public health problem including specific sessions on data, research, and surveillance issues; program development; policy; and various approaches to violence prevention. Educational methods include lectures, presentations by public health role models who practice violence prevention in the community, class exercises, and class discussions. (SP) Cohen, Ragin

202F. Advanced Social and Cultural Theory. (3) Three hours of seminar per week. Prerequisites: 201A, doctoral student status, and consent of instructor. The course is designed to link current advances in sociological and anthropological theories to relevant public health issues. Particular emphasis is placed on providing theoretical foundations for dissertation research. (F) Morgan

203A. Theories of Health and Social Behavior. (3) Three hours of lecture per week. Prerequisites: Backgroung in social and behavioral science. Consent of instructor. The course provides a survey of theoretical perspectives and their application in analyzing the behavioral, social, and cultural dimensions of community health problems placed in certain historical and evolutionary contexts. Exploring the strengths and weaknesses of particular theories for addressing complex health problems and mounting effective community-based intervention programs. (SP) Block

204A. Mass Communications in Public Health. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. Examines the role of mass communication in advancing public health goals. Reviews basic media theories in general, and theories of the news media in particular. 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. (SP) Staff

204B. Training as an Educational Methodology. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. 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. (SP) Staff

204C. Occupational Health Education. (2,3) Two hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Examines the role of mass communication in advancing public health goals. Reviews basic media theories in general, and theories of the news media in particular. 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. (SP) Staff

204D. Community Organization and Community Building for Health. (3,4) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Examines the health status of communities and the role of health practitioners as change agents, stressing in particular those values and ethical issues which arise within the context of diverse and multi-cultural communities. Both advancement of theoretical knowledge and the development of skills in applying such knowledge in the areas of community organization and community building will be stressed. This is a Service Learning Course, and students wishing to undertake a concurrent internship may earn an additional optional unit of credit. (F) Minker

204E. Multicultural Competence in Public Health. (3) Three hours of lecture per week. Prerequisites: Enrollment in Multi Cultural Health Specialty area or consent of instructor. This class will focus on developing a foundation in understanding public health and will initiate the student in developing culturally competent tools. Understanding the basic assumptions of the public health system, discovering one’s own cultural competence and how it relates to vulnerability as well as respect values related to approach and process. Will enable the student to be more effective as a public health practitioner. This course will achieve these goals through a combined approach of lecture, discussion, and class presentations of a case study. (F) Fraticelli

205. Program Planning, Development, and Evaluation. (3) Three hours of lecture/discussion per week. Prerequisites: Public health students. Basic elements and components of public health programs, case material will be drawn from health settings, with emphasis on multidisciplinary planning. Assessment of problems, setting goals and objectives, designing action, implementation and evaluation. (SP) Guendelman

206A. Measuring Dietary Intake and Nutritional Status. (2). Two hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. Concepts, methods, and limitations in the determination of nutritional status; application of methodological tools for determining and interpreting data; technical, social, and political implications of nutritional assessments and related community needs. (SP) Block

206B. Food and Nutrition Policies and Programs. (2) Two hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. This course focuses on the national and state policies and the various types of intervention programs aimed at improving the nutritional status of the American people. These include food assistance programs, food and nutrition education initiatives, and food quality and safety regulatory activities. Emphasis is on the legislative histories, policies and the policy aspects of their development, and in project development, design, administration, implementation, and evaluation. (F) Sabry

206C. Nutritional Epidemiology. (3) Three hours of lecture/discussion per week. Prerequisites: Previous course in advanced nutrition and 150A or equivalent consent of instructor. Develops the ability to read published nutritional epidemiology research critically. Basic research methods in nutritional epidemiology will be reviewed, and issues in design, analysis, and interpretation of epidemiologic data. Nutritional epidemiology will be addressed. This will be accomplished by readings and study questions, lecture/discussions, and problem sets, followed by student presentations of the research of a body of literature on a particular research question in nutritional epidemiology. (F) Abrams

207A. Public Health Aspects of Maternal and Child Nutrition. (2) Two hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. An overview of important health problems during pregnancy, lactation, infancy, childhood, and adolescence. Introduction to nutritional assessment of individuals and communities. Discussion of state and federal policies, and strategies to improve nutritional status for mothers and children. Course is intended for students of Maternal and Child Health, Social Welfare, and other disciplines as well as nutrition students. (F) Abrams

C207B. International Food and Nutrition Policies. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Examines the health status of communities and the role of health practitioners as change agents, stressing in particular those values and ethical issues which arise within the context of diverse and multi-cultural communities. Both advancement of theoretical knowledge and the development of skills in applying such knowledge in the areas of community organization and community building will be stressed. This is a Service Learning Course, and students wishing to undertake a concurrent internship may earn an additional optional unit of credit. (F) Minker

*Bprefix=language course for business majors
Cprefix=cross-listed course
Hprefix=honors course
Rprefix=course satisfies R&Q requirement
ACsuffix=course satisfies American cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
Data Analysis for Community Health Science. (2) One and one-half hours of lecture and two hours of laboratory per week. Prerequisites: Introductory statistics course and working knowledge of personal computer software. This course will cover complex linear regression models, hypothesis testing for linear and non-linear models, techniques for model selection, and the analysis of categorical data. Students will learn to interpret and evaluate statistical models and results. (SP) Kaskutas

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 the health and policies that affect maternal and child health. The following concepts will be explored and addressed in depth: 1) the foundation of maternal and child health, including an overview of the field, history, and foundation of MCH practice and programs, and attention to financing of these programs; 2) MCH data sources, uses of data, and related issues; and 3) policies and practices in MCH (including discussion of professional ethics and address practical problems, public policy concerns, current issues in MCH, and current research in MCH). In addition, major health problems facing women, children, and adolescents will be explored, including how and why these are distributed in these populations. (F) Gould

Problems and Programs in Maternal and Child Health: Needs Assessment. (2) Two hours of seminar/discussion per week. Prerequisites: Major in maternal and child health or consent of instructor. Research methods and issues in maternal and perinatal epidemiology with emphasis on methods of study. Specific adverse reproductive outcomes, risk factors, and prevalence will be discussed. Will include critiques of published studies and techniques of proposal writing. (SP) Ekenazi

Reproductive and Perinatal Epidemiology. (2) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: Graduate standing in epidemiology or consent of instructor. Research methods and issues in perinatal and reproductive epidemiology with emphasis on methods of study. Specific adverse reproductive outcomes, risk factors, and prevalence will be discussed. Will include critiques of published studies and techniques of proposal writing. (SP) Ekenazi

Health and Human Rights. (3) Three hours of lecture/discussion per week. This course examines the origins of health and human rights concerns and outlines a conceptual framework for human rights and health professionals. It provides an overview of the epide- miology of human rights violations worldwide and an analysis of the psychology of abuse. The course con- sidered the legal frameworks of professionals in (1) understanding the health and social consequences of human rights violations and war; (2) treating survivors of abuse; (3) addressing specific human rights concerns of women, children, and other vulnerable populations; and (4) applying the principles of human rights to health policy on human rights and (5) participating in human rights education and advocacy. The course will also examine issues of universality of human rights and cultural relativism and the role of accountability for the past abuses in prevention. (F) Jacobson, Orr, Stover, Weinstein

International Maternal and Child Health. (2) Two hours of lecture/discussion per week. Prerequi- sites: Graduate standing or consent of instructor. Assess- ment of health status of mothers, infants, and chil- dren on a worldwide basis; analysis of problems, policies, and programs affecting MCH and family planning in developing countries. (F) Hosang, Potts

Review of Maternal and Perinatal Health. (2) Two hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Beginning with the physiologic processes of pregnancy, this course will examine individual and contextual risks for poor pregnancy outcome. Strategies used to evaluate and improve perinatal outcome and institutional and insti- tutional level will be examined. (F) Gould

Health and Social Policy in Mexico and Latin America. (2-3) Two hours of lecture and one hour of discussion per week. Critical issues in health and so- cial welfare policies and structures in Latin America. Various stages of development are considered and related to health and social well being. Themes are ex- amined from a multidisciplinary perspective conveying demographic, epidemiology, family structure, envi- ronmental factors, occupational health, and migra- tion. (SP) Guendelman

International Health Specialty Area Core Course. (3) Two hours of lecture and one hour of dis- cussion per week. Prerequisites: Consent of instructor. The International Health Core Course is a survey course for students who intend to work in international health. Current issues in health and development as they apply to international development projects funded by international agencies will be discussed. The course begins with a description of health issues in a sample of representative developing countries. The structure, function, and funding arrange- ments of international agencies are examined. The role of the consultant in international health and the con- siderations for sustainable community-based programs are dis- cussed. Students are required to write a proposal for projects to be funded by funding agencies. These pro- posals are used as vehicles for demonstrating the complexities of the relationships between donors and recipients. A "student committee" is used to select pro- posals for funding based on different evaluation criteria, (SP) Potts, Walsh

Family Planning, Population Change, and Health. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. Course examines the determinants of fam- ily size, fertility control strategies, contraceptive volun- tary, sterilization, and induced abortion in the transition to small families. It looks at the factors controlling access to fertility regulation in developed and developing coun- tries and discusses the factors that have made for suc- cessful family programs as well as those that have generated controversy. The course looks at the relation- ship between family planning and the health of women and children and at the role of family size in economic development and environmental problems. It looks at advances in family planning, organization, and promotion of services and discusses ethical issues facing providers. (F) Potts

Current Issues in Women’s Health. (2) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Provides an opportunity to discuss major historical and con- temporary issues in women’s health throughout the life span, with an emphasis on the reproductive health issues into the broader study and practice of public health; to examine women’s health care controversies and proposable possible solutions. (F) Miller

Money, Management and Maternal and Child Health. (3) Three hours of lecture per week. Prerequi- sites: Consent of instructor. This course will expose students to the management of budgets, money, and resources using primarily maternal and child health issues and cases as examples. It will deal with cost analysis, cost-effectiveness anal- ysis, program budgets based on performance and outcome measures, and setting priorities when re- sources are limited and an introduction to human re- souce management. The methods will be delineated through case studies of maternal and child health programs domestically and internationally. By the end of the course, students will be familiar with the information and analysis required for decision making and the data and resources available for the an- alysis. (SP) Hosang, Walsh

Aging: Value and Social Policy Issues. (3) Three hours of lecture per week. Prerequisites: Graduate standing in public health or related discipline. Exam- ines key themes and issues central to under- standing the population, burdens, and implications of aging, including social, economic, and public health education, public policy, and aging. (F) Minkler

Aging, Health, and Functioning. (3) Three hours of lecture per week. Prerequisites: Graduate standing. An examination of conceptual and analytic is- sues associated with the assessment of physical and cognitive functioning in clinical, epidemiologic, and health services research. Special attention will be given to measures of quality of life, quality of care, and active life expectancy in studies of older populations. (F) Sa- tariano

Aging and Public Health. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. The purpose of this course is to provide an overview of research, practice, and policy in the area of aging and public health. Topics will in- clude the demography of aging, nursing home, and aging; nutrition and the elderly; current health care policy surrounding aging. Themes running throughout the course and linking a number of the topics covered will include the diversity of the elderly, the importance of co-morbidity and functional health status in this pop-ulation group; the family and broader environmental contexts in which aging takes place; and the influence of public and private sector policies on health and health-related behavior in the elderly. Weekly lectures by the faculty will be complemented by presentations by prominent Bay Area researchers in the areas of geriatrics and gerontology. Students will also take the School of Public Health specialty in aging and pub- lic health. (F) Minkler, Satariano

Research Methods: Logic and Design. (3) Three hours of lecture/discussion per week. Prerequi- sites: Graduate standing or consent of instructor. An introduction to research study of logic, theory, concepts, and methods of behavioral research as they apply to public health. (F) Staff

Evaluation of Health and Social Programs. (3) Three hours of lecture/discussion per week. The strengths, methods, rationale, and uses of evaluation research as they apply to health and social programs. (SP) Staff

Advanced Evaluation Research Methods: Evaluation Policy Research. (3) Three hours of lec- ture/discussion per week. Prerequisites: Introductory course on program evaluation such as 218B. This is an advanced course on evaluation research. It is in- tended for those who have already completed an intro- ducatory course on program evaluation (such as 218B), and it will be especially useful for doctoral stu- dents intending to pursue careers as policy analysts or teachers of evaluation. 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 devel- oped in each stage; (2) describe the evaluation theo- ries of at least eight leading evaluation theorists and describe the strengths and weaknesses of each approach; (3) identify the theoretical perspectives that have influenced the implementation of published evalu- ation studies; (4) distinguish among the following types of evaluations: impact, 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 profes- sional setting. (F) Randell

Advanced Qualitative Research. (3) Three hours of lecture/discussion per week. Pre-
requisites: Doctoral student in public health or a related discipline, or consent of instructor. An overview of the theoretical and methodological components involved in various aspects of qualitative research. (F) Morgan

219B. Advanced Methods: Interview and Questionnaire Design. (3) Three hours of lecture/discussion per week. Prerequisites: Doctoral student in public health or a related discipline, or consent of instructor. The study of interviews, questionnaires, and other methods used in health and related surveys. (SP) Weisner, Kaskutas

220A. Health Politics and Policy. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. The role of public health communities and their implications for public health are described. Students are also introduced to the opportunities available to public health professionals to participate in the planning of health care services. (SP) Schaffner

220B. The Role of Public Health in Community Planning. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. The role of public health professionals in the development of healthy cities. Key community leaders will participate. (SP) Catalano

220C. Risk Assessment, Policy, and Toxics Regulation. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Graduate standing or consent of instructor. This course introduces the basic scientific components of environmental and occupational health risk assessment and describes 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 toxic chemical exposures; toxic chemicals; groundwater; the four major components of risk assessment: hazard identification (interpreting animal toxicology or epidemiology data on toxic chemicals); dose-response assessment (estimating the relationship between toxic dose and adverse health impacts); exposure assessment (characterizing pattern of human exposure to toxic chemicals); and risk characterization (generating estimates of the health risks posed by exposure to toxic chemicals). The second half of the course provides a broad overview of occupational and environmental health policies. Current political controversies about environmental policy will be examined: the distribution of health risks by race and class, the costs and benefits of regulation, and the need to establish priorities for environmental and human health risks. (SP) Pease, Robinson

221A. The City and Health: Emphasis on Oakland. (3) Two hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. Formerly 221A-221B. A history and analysis of the relationship of urban development and the health of its populations. The problems of diversity, politics, participation, governance, economic development, poverty, housing, community infrastructures, planning, and policy will be emphasized. Healthy cities as an organizing framework for the “new public health” will be used as a model of coping with health and related issues. Looks at factors which can make Oakland a healthy city. Key community leaders will participate. Students will do active studies in local programs as part of the city’s and community’s agenda. (SP) Duhl

222. Health Planning and Policy: An International Perspective. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instruction to health care courses in any discipline, and planning throughout the world—rich and poor, centralized and decentralized. A group report will be developed for a major client dealing with international health issues. (F) Duhl

223A. Medical Care Organization. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor to health care courses in any discipline, and planning throughout the world—rich and poor, centralized and decentralized. A group report will be developed for a major client dealing with international health issues. (SP) Pease

223B. Hospitals, Hospital Systems, and Managed Health Care. (3) Three hours lecture/discussion per week. Development of the hospital as a social and economic institution; development of hospital systems and integrated delivery systems; and development of managed care. (SP) 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 general background knowledge 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 accomplished by examining systems-wide, organization-wide, group- and individual-level issues in strategy formulation, content, implementation, and performance. Emphasis is placed upon the manager’s role in simultaneous taking into account a 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 variety of health care organizations including physician group practices, health systems, hospitals, HMOs, suppliers, pharmaceutical and biotech companies. The course builds on Business Administration Behavioral Science and 223A: Medical Care Organization. (SP) Shortell

224A. Health Care Organizations and Environments. (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 services. Cases, simulation, and structured experiences will be used to tie theory to practice. (SP) Bloom

224C. Advanced Health Organizations and Environments. (3) Three hours of lecture per week. Prerequisites: 224A or 224B or consent of instructor. Study of current approaches to the theories of innovation and change as they relate to theories of complex organizations and inter-organizational relationships in health administration. (F) Bloom

224D. Organizational Analysis of the Health Care Sector. (3) Three hours of seminar/discussion per week. Prerequisites: One doctoral-level organizational behavior course. This course examines the major theories and frameworks for analyzing health care organizations. Emphasis is given to the application and testing of theories in the health care sector. Resource dependency, contingency, population ecology, institutional theory, and other theories are examined. The seminar will rely on extensive student participation. (F) Shortell

225. Legal Basis for Public Health. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor, Statutes, cases, and readings in the legal basis for public health, medical care administration, and law related to hospitals. (SP) Staff

226A. Health Economics. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. Topics include vertical integration, relational contracting and network forms of organization, principal-agent relations, the dynamic capabilities of firms, reputation as a guarantor of quality, and the implications of nonprofit, for-profit, and public ownership. Applied topics include managed integrated delivery systems, organizational chains and franchising, multispecialty medical groups, and health maintenance organizations. Offered every numbered years. (SP) Robinson

227A. Health Care Finance. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing. Overview of financial analysis and incentives in health care systems. Theoretical concepts include vertical integration, relational contracting and network forms of organization, principal-agent relations, the dynamic capabilities of firms, reputation as a guarantor of quality, and the implications of nonprofit, for-profit, and public ownership. Applied topics include managed integrated delivery systems, organizational chains and franchising, multispecialty medical groups, and health maintenance organizations. Offered every numbered years. (SP) Robinson

227B. Advanced Financial Management and Regulation of Health Care Institutions. (3) Three hours of lecture/discussion per week. Prerequisites: Business Administration 203 or consent of instructor. Financial management and regulation of health care institutions, including relationship between institutional and national politics, with regard to reimbursement, incentive systems, public regulation, and control of health care costs. Course is based on a computer game simulation. (SP) Gertler

228. Cost-Effectiveness Analysis in Health and Medicine. (3) Three hours of lecture per week. Prerequisites: Business Administration 226A or equivalent. This course introduces methods to estimate costs and effectiveness in health services. Specific topics include theory and empirical estimations of cost analysis, effectiveness analysis, and cost-effectiveness comparison. (SP) Hu

230. Advanced Health Politics. (3) Three hours of lecture per week. Prerequisites: Business Administration 224A or consent of instructor. Critical analysis of selected issues in health policy. Topics include political ideology and health policy, interest group politics in health, Marxist and materialist interpretation of health policy.
and the politics of health care technology, implementation, bureaucracy, and health professions. (F) Schaffter

231A. Research Methods for Health Services I. (3) Three hours of lecture/discussion per week. Prerequisites: 142A and 142B (may be taken concurrently). Review of general methods of biostatistics and regression analysis, empirical applications, and model building for analyzing health services. (F) Hu

231B. Research Methods for Health Services II. (3) Three hours of seminar/discussion per week. Prerequisites: 231A or consent of instructor. Methods of model building for health care delivery systems, forecasting methods, and other multivariate methods. (SP) Hu

232. Doctoral Seminar in Public Health Applications of Time Series Analysis. (3) Two hours of lecture and one hour of laboratory per week. Prerequisites: Doctoral standing or consent of instructor. An introduction to time-domain analyses of potential interest to public health researchers and practitioners. Applications in forecasting and hypothesis testing will be demonstrated. (F.SP) Catalano

233. Seminar on Place and Health. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor for MPH students. The purpose of this course is to help doctoral and advanced MPH students to explore and understand the literature that describes and attempts to explain spatial variation in illness. The implications of the literature for public health practice will also be discussed. The course is organized as a seminar in which students present a taxonomic overview of the literature and review the controversies in the field. Students will then present literature of special interest to them. The presentations will locate the piece in the taxonomy and explore the implications of the work for public health practice. (SP) Catalano

240A. Biostatistical Methods: Risk Research Methods. (3) Three hours of lecture per week. Prerequisites: 247A must be taken concurrently. Statistics 200A (may be taken concurrently). Modelling of risk processes, including design, sample size planning, bias control, and multifactor prediction and analysis. (F) Staff

240B. Biostatistical Methods: Survival Analysis. (3) Three hours of lecture per week. Prerequisites: 247B must be taken concurrently. Statistics 200A (may be taken concurrently). Analysis of survival time data using parametric and nonparametric models, hypothesis testing, and regression methods for censored data with applications to survival analysis. (SP) Staff

241. Statistical Analysis of Categorical Data. (4) Three hours of lecture and two hours of discussion/laboratory per week. Prerequisites: 142A or consent of instructor. Biostatistical concepts and modeling relevant to the health sciences. The course covers the concepts of matched and unmatched case-control studies, and intervention studies. Logistic regression and the analysis of 2x2 tables. (SP) Staff

242A. Biometrical Data Analysis—Pathological Incomplete Data and Pattern Recognition. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 142A-142B or equivalent, or consent of instructor. Survey of classical methods; mixture, clustered, grouped, incomplete, Cox model, and truncated data simulation. (SP) Tarter

242B. Biometrical Data Analysis—Model-Free Curve Estimation. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 142A-142B or equivalent, or consent of instructor. Generalized hierarchical Charlier expansion of probability mass functions including inclusion and stopping rules, multiplier and weighting techniques, nonparametric regression, variance reduction, smoothing, and equivariance properties of estimation methods and other graphical methods. (SP) Tarter

242C. Longitudinal Data Analysis. (2) Two hours of lecture per week. Prerequisites: 142A-142B or equivalent. Familiarity with linear regression and statistical software, preferably Splus or SAS. The course will cover the statistical issues surrounding estimation when repeated outcome measurements are made on the same "individual". The course will emphasize a regression model approach. Most of the course will concentrate on continuous outcome data and linear models. It is but a warm-up for the more challenging (e.g., binary and count data) and perhaps other nonlinear repeated measurement models. The primary focus of the course will be from the analysis side. Lecture time will be spent both on methodology and techniques for implementing this methodology in both Splus and SAS. The statistical mathematical material for this course includes normal linear models, maximum likelihood estimation, various types of generalized linear models and matrix algebra for statistics. Offered even-numbered years. (F) Hubbard

243A-243B. Special Topics in Biostatistics. (1-3-1) Three to one hours of lecture/discussion per week. Current issues in biostatistics research. Topics will vary from term to term depending on student demand and faculty availability. Possible topics are bioassay, meta-analysis, compartmental models, biostatistical con- cerning, covariance structure models, bootstrap and jackknife methods, artificial intelligence techniques in biostatistics. (F.SP) Staff

243C. Information Systems in Public Health. (2) Two hours of lecture/discussion per week. An introduction to new information systems, such as the Internet and interactive television, and how they may be used to further develop the Splus and SAS. The course has three objectives: first, to familiarize students with new information technologies; second, to review how these technologies will be used in health professions, consumers, health care providers, and others; and third, to study related ethical and legal issues such as privacy, access, and liability. The course is designed for people with minimal understanding of in- tegrative technologies. (SP) Van Brunt

244A. Stochastic Processes in Biology and Health. (3) Three hours of lecture per week. Prerequisites: A course in linear algebra or consent of instructor. Discrete time processes. Topics include probability generating functions; branching process, random walk and ruin problem; Markov chains; renewal processes and applications in biology and health. (F) Chiang

244B. Stochastic Processes in Biology and Health. (3) Three hours of lecture per week. Prerequisites: 244A, a course in differential equations, or consent of instructor. Continuous time processes. Topics include the Poisson processes; birth processes, death processes, migration processes, a general birth process; a stochastic model of epidemics; birth-death processes; queuing process; a stochastic model of epidemics; birth-death processes. (SP) Chiang

245. Introduction to Multivariate Statistics. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: 247A or equivalent or consent of instructor. The following topics are discussed in the context of biomedical and biological application: multiple regression, loglinear models, discriminant analysis, principal components. Instruction in statistical computing is given in the laboratory session. (F) Lahiff

246. Statistical Methods in Survival Analysis. (3) Three hours of lecture per week. Prerequisites: Calculus, matrix algebra, one year of mathematical statistics. Analysis of survival time data. Parametric and nonparametric estimation of survival functions; branching process, Cox proportional hazards model. (SP) van der Laan

247. Data Analysis Workshop. Two hours of laboratory per week. Computing techniques, numerical methods, simulation and general implementation of biostatistical analytic techniques with particular emphasis on data applications to topics as listed below. (F.SP) Staff

248. Workshop in Biostatistical/Epidemiologic Applications. (2) Two hours of lecture/discussion per week. Prerequisites: 245 and 249 or equivalent. This course focuses on advanced biostatistical methods applied to real data. Fifteen data sets are analyzed, each representing a different type of data collection design (e.g., case/control data, matched data, vital statistics data, and survival data). These data sets are taken from articles published in biomedical journals and illustrate methods, simulation and general implementation of biostatistical analytic techniques with particular emphasis on data applications to topics as listed below. (F.SP) Staff

249. Workshop in Statistical/Computer Analysis Using Splus. (3) Three hours of discussion per week. Prerequisite: Stat 200A (may be taken concurrently) or 142A-142B and 245. The material to be presented will focus on learning the programming language SPLUS, which will be taught in the context of reviewing and introducing a number of statistical meth- ods. Four topic areas will be presented with the focus on implementation; these are descriptive methods, simulation techniques, linear models, and estimation. The goal of the course is to provide a package of sta- tistical techniques along with new and advanced computer tools for implementation. (F) Selvin

250A. Epidemiological Methods. (3) Three hours of lecture and three hours of discussion per week. Prerequisites: 250A or an equivalent introductory course in epidemiology; 142A or concurrent enrollment or consent of instructor. Principles and methods of epi- demiology: study design, selection, and definition of controls; sampling techniques; epidemiologic concepts and inference. Discussion sessions provide an opportunity to apply methods to problem sets and to discus- sion issues presented in lectures. (F) Winkelstein, Smith

250B. Epidemiological Methods II. (4) Four hours of lecture and two hours of laboratory per week. Prerequisites: 250A or an equivalent introductory course in epidemiology or consent of instructor. This course is intended as an intermediate level course in the field of epidemiology. Topics include current issues in biostatistics and intervention. Four topic areas will be presented with the focus on implementation; these are descriptive methods, simulation techniques, linear models, and estimation. The goal of the course is to provide a package of sta- tistical techniques along with new and advanced computer tools for implementation. (F) Selvin

250C. Epidemiological Theory. (3) Four hours of lecture per week. Prerequisites: 142A, 250A-250B, and consent of instructor. This course is a continuation of 250B. Topics that follow from 250B include causal inference, the interrelation between measures of disease frequency, the theory that underlies case-control studies, and further exploration of the quantitative aspects of bias, confounding and measurement error. An intro- duction to the theory of ecological studies also is provided. Readings are primarily from the epidemiolog- ical methods literature, and problems are based on the evaluation of published data. (SP) Tager

251A. Practicum in Epidemiologic Methods I. (3) Three hours of lecture and two hours of laboratory per week. Prerequisites: 250A; 142A or 241B concurrently; consent of instructor. A two-semester sequence intended for students in the Epidemiology/MPH/BIOSTAT program and other qualified 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 or- der to discover the researchable questions. The course teaches use of CMS and SAS in performing univariate analyses; students also learn critically to review sci- entific literature. Students are required to complete computer assignments, an oral presentation of a lite-
erature 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) Eskenazi

251C. Causal Inference and Meta-Analysis in Epidemiology. (2) Two hours of lecture per week. Prerequisites: 241B, 245, 250A, or consent of instructor. Advanced treatment of epidemiologic techniques, discussion of bias and power, analysis of cohort data, cluster data, and contingency tables; logistic regression; analysis of time-dependent data including life tables, Kaplan-Meier estimation, and proportional hazard models. (SP) Selvin

252A. Applied Sampling and Survey Design and Analysis. (2,3) Two hours of lecture per week for 2 units; an additional computer laboratory of two hours required per week for 3 units. This course will cover the basics of survey and sampling; survey weights and variance estimation. Emphasis will be placed on examples of the use of computer software to perform statistical analyses. (F) (P) Abraham

252B. Modeling the Dynamics of Infectious Disease Processes. (2-4) Two hours of lecture and three hours of laboratory per week. Prerequisites: Calculus (e.g. Math 1A-1B), statistical programming packages (247, 249, or equivalent). This course will cover the basics of stochastic processes used to model disease transmission and to evaluate models for choosing study designs for assessing the effectiveness of interventions. Emphasis will be placed on the application of epidemic models to infectious disease prevention and control. (F) Piazza

253A. Topics in Disease Surveillance. (2) Two hours of lecture and one hour of laboratory per week. Prerequisites: Consent of instructor. Emphasize the use of surveillance for infectious and non-infectious diseases; meet various goals. The impact of various biases on surveillance for infectious and non-infectious diseases; developing and using models as research tools. (SP) Eisenberg

253B. Epidemiology and Control of Infectious Diseases. (3) Three hours of lecture per week. Prerequisites: Prior degree or courses in biomedical sciences and consent of instructor. Discussion of surveillance, laboratory investigation, diagnosis, timing of possible preventive measures. The course compares the cost of care and prevention and analyzes the social and political barriers that influence the allotment of resources. The course will use examples of government and private sector responses to the care of People with AIDS and to preventive measures from the USA and around the world. (SP) Potts

253D. Behavior and Policy Science in HIV Treatment and Prevention. (3) Three hours of lecture per week. This course will integrate various social science disciplines and will apply these perspectives to problems of HIV treatment and prevention, particularly in the developing world. Through the academic term, students will apply knowledge of behavioral science, epidemiology, quantitative and qualitative methods in the analysis of evaluating HIV-related treatment and prevention interventions, including policy interventions. Course requirements will include the preparation of a major paper recommending interventions, and the evaluation of strategies for a specific developing country. Specific requirements for this paper will be distributed during the third class session. (F) Ekstrand

254A. Environmental and Occupational Epidemiology. (3) Three hours of lecture per week. Prerequisite: Consent of instructor. Principles and methods of epidemiology with a focus on interpreting and critiquing published occupational and environmental epidemiology studies and making causal inferences from them. The course is designed for students whose primary interest is in occupational and environmental health. (F) A. Smith

254B. Advanced Occupational and Environmental Epidemiology. (3) Three hours of session per week. Prerequisites: 250A or 254A. Epidemiological methods for designing, conducting, and interpreting epidemiological studies of persons occupationally or environmentally exposed to chemical and physical agents. The course builds on material in 254A, but 250A is sufficient as a prerequisite. (SP) A. Smith

255A. Social Epidemiology. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. A critical review and discussion of social and psychological factors that affect the distribution of disease in populations. The course will cover those risk factors that have been studied most extensively with special attention to methodological and research design issues, problems in definition and assessment, and problems of confounding. Detailed attention will be paid also to the role that link psychosocial factors and physiological function. (SP) Boyce, Satarnato

255B. Perinatal Epidemiology. (2) Two hours of discussion per week. Prerequisites: 250A helpful. Doctoral-level seminar on epidemiological issues involving women's health and perinatal health. Course will incorporate student presentations and discussions of readings. (F) Abrams

256. Molecular and Genetic Epidemiology. (3) Two hours of lecture and two hours of laboratory per week. Review of genetic epidemiology with emphasis on novel methods of molecular biology and genetics, including role of genetic factors in human disease and their interaction with environmental and cultural factors, population polymorphisms, role of inbreeding, and epidemiological studies. Molecular epidemiology and the use of biological markers will be explored with the goal of illustrating both the power and limitations of biomarkers currently available for epidemiological research. Laboratory work and Internet demonstrations will provide hands-on experience with modern methods of molecular epidemiology. (F) Holland, Sensabaugh

257. Outbreak Investigation. (1,3) One hour of seminar per week in class or outside class time. Prerequisites: Consent of instructor. This course will teach students and health care workers how to conduct outbreak investigations. Methods and approaches required for such investigations will be discussed in detail, using published articles from the scientific literature to present the current state of knowledge. Students will participate in evaluation of actual outbreaks and clusters in conjunction with nearby county health departments and under the supervision of the instructor. Students may opt to take the seminar component without the field work requirement. (F,SP) Reingold

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 major cancers, considering epidemiological approaches to the study of their causation, and implementation will be discussed. (SP) Block, Buttlar, Winkelstein

259B. Practical Applications of Epidemiologic Methods in Developing Countries. (3) Three hours of lecture per week. Prerequisites: Knowledge of epidemiologic methods in the developing country settings, including surveillance, surveys, case-control studies, and intervention trials. The applications of these methods to the study of infectious and non-infectious diseases, problems common in developing countries will be presented. (F) (Reingold

260A. Principles of Infectious Disease. (3) Three hours of lecture per week. Prerequisites: Upper division course preparation in biology, molecular biology, immunology, or consent of instructor. This course presents general principles of microbial interactions with humans that result in infection and disease. Common themes are development of virulence, bacterial virulence factors, and para- and patholopathological mechanisms that elicit responses to infections. The course presents the unique attributes of pathogens that promote disease interactions with their hosts and the biological and anatomical features of the host. (F) Stephens

260B. Infectious Disease: Host-Parasite Interactions. (4) Four hours of lecture/discussion per week. Prerequisites: 260A or consent of instructor. A critical analysis of the host-parasite interactions that occur and influence the health of humans with disease agents, including representatives of nematodes, trematodes, cestodes, protozoa, fungi, bacteria, viruses, and prions. The epidemiology, pathogenesis, host immune responses, molecular diagnosis, treatment, and control will be presented for each infectious disease discussed. (SP) 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 weeks. 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; laboratory safety. Module II: Application of molecular methods to the identification and characterization of infectious agents; use of laboratory-based investigation in developing countries. Specific requirements for a specific developing country. Specific requirements will be presented for each infectious disease discussed. (SP) Swartzberg

260D. Infectious Disease Laboratory. (2,4) Course may be repeated for credit. Three hours of laboratory per week per unit. Prerequisites: 260C or consent of instructor. Practice in application of methods used in infectious diseases research. Projects vary from year to year. (SP) Staff

260E. Molecular Epidemiology of Infectious Diseases. (2) Two hours of lecture per week. Prerequisites: 150A. The course will cover general principles of molecular techniques to assess for and quantify infectious disease epidemiology problems. It is designed for students with experience in the laboratory or in epidemiology, but not both. The principles to be discussed will include the use of molecular technology for epidemiologic investigations, characterization of dynamics of disease transmission, identification, quantifying attributable risks in sporadic infections, refining data stratification to assist case-control studies, distinguishing pathogens from non-pathogenic variants of organisms, and the design of surveillance, and identifying genetic determinants of disease transmissions. (F) Riley

260F. Infectious Disease Research in Developing Countries. (2) Two hours of seminar per week. The course is designed for master's and Ph.D. candidates with students with an appreciation and understanding of the complex issues involved in conducting scientific, laboratory-based research 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, and Africa. We will also discuss related issues such as ethical considerations, emerging markets, research capability strengthening. During the second half of the course, students will give presentations on topics of their choice. Offered alternate years. (SP) Harris

261. Advanced Medical Virology. (3-4) Four hours of lecture per week. Prerequisites: Consent of instructor. Analysis of viral and host factors that play a role in viral diseases of medical importance. Four credit units of credit to doctoral 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 per week and one hour of literature review, Prerequisites: 260A or consent of instructor. This course for graduate and advanced undergraduate students will explore the molecular and cellular basis of bacterial pathogenesis. The emphasis will be on model bacterial pathogens of mammals. The course also will include some aspects of bacterial genetics and the response to Consensus of instructor. Analysis of the interaction, blood-borne pathogens, and OSHA guidelines. (SP) Robinson

263. Public Health Immunology. (3) Three hours of lecture per week. Prerequisites: Some prior knowledge of immunology is desirable. Current immunological developments in relation to hypersensitivity, tolerance, immunomodulation, auto-immune diseases, transplantation, and infectious diseases. (F) Portnoy

264. Current Issues in Infectious Diseases. (2) One hour of lecture and one hour of discussion per week. Prerequisites: Graduate standing. 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) Nisalak

265. Molecular Parasitology. (3) Course may be repeated for credit. Three hours of lecture and two hours of discussion for ten weeks. Prerequisites: Upper division courses in molecular biology, parasitology, biochemistry, microbiology, or consent of instructor. Familiarity with reading primary research is recommended. Advanced course in the molecular aspects of parasite immunology, molecular biology, genetics, biochemistry, and genetics. 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" research 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. The course will rely heavily on current literature. (F) Harris

266. Viruses and Human Cancer. (3) One hour of lecture and one hour of discussion of assigned readings per week. Prerequisites: Course in basic virology or microbiology. Topics include the molecular biology of human tumor viruses; mechanisms of viral carcinogenesis; in vitro vs. in vivo characteristics of virally transformed cells; the epidemiology, pathology, diagnosis, treatment, and prevention of virally caused cancers; problems of primary care of virally caused cancers. A term paper or grant proposal is required. (SP) Buening

267A. Engineering Control of Airborne Chemicals. (3) Three hours of lecture per week. Prerequisites: Graduate standing in environmental health sciences or consent of instructor. Principles of hazard evaluation and control of airborne chemicals in industry that have an impact upon the occupational and community environments. Particular emphasis is placed on air pollution control and industrial ventilation. Students develop a course project on case solving specific situations. (SP) Koshland

267B. Characterization of Airborne Chemicals. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing in environmental health sciences or consent of instructor. Principles underlying the use of air monitoring methods in industry and the built environment. Topics include behavior of gases, vapors, and aerosols; mechanisms of absorption and elimination of inhaled toxicants; methods for measuring of airborne chemicals. (SP) Hammond

268A. Industrial Hygiene: Physical Agents. (3) Three hours of lecture per week. Prerequisites: 267A or 267B. Noise and radiation as occupational hazards, including environmental evaluation and related damage-risk criteria. (SP) Speal, McKone

268B. Case Studies in Industrial Hygiene. (2) Two hours of lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory. Prerequisites: Consent of instructor. Provides an overview of the industrial hygiene field, including issues of worker’s compensation, indoor air quality and respiratory protection, hearing conservation, radon and radon daughters, radiation, blood-borne pathogens, and OSHA guidelines. (SP) Robinson

268C. Industrial Hygiene: Professional Practices. (3) Three hours of laboratory/laboratory or discussion per week. Prerequisites: 267A or 267B. Familiarizes students with the professional skills practiced by industrial hygienists in management, labor, and government programs. Introduces students to the occupational environments in selected industries. (SP) Plog

269A. Principles of Occupational and Environmental Diseases. (3) Three hours of lecture/discussion per week. An overview of the major occupational diseases including pulmonary, dermatologic, musculoskeletal, neoplastic, viral, bacterial, and chronic diseases. (SP) Tempelis

269B. Occupational Safety. (2) Must be taken on a letter-grade basis. Two hours of lecture per week. Presents an overview of and introduction to the occupational safety function including a discussion of the various functions and components: safety program development, policy and procedures, safety engineering, fire protection engineering, environmental health engineering, system safety engineering, risk management, accident investigation, and cost/benefit analysis. (SP) Seward

269C. Ergonomics. (3) Three hours of lecture per week. Introductory course covering pathophysiology and work-related risk factors of chronic musculoskeletal disorders, biomechanics of material handling, anthropometry applied to workstation design and seating, and structure of ergonomics programs. Students will conduct a job analysis. (SP) Rempel

269D. Ergonomics Seminar. (2) Two hours of lecture per week. Prerequisites: 269C or consent of instructor. Readings and lectures in occupational biomechanics. Topics to be covered are muscle, tendon, and joint biomechanics, material handling models, mechanisms of injury, and recognition and prevention of cumulative trauma disorder issues. Students will prepare critical reviews of recent publications and design an engineering intervention to reduce work-related risk factors. Offered alternate years. (SP) Rempel

270A. Exposure Assessment and Control. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Direct and indirect methods and procedures for the estimation and control of human exposure to chemical, physical, and biological agents of concern to health in the community and in occupational settings. Includes review of measurement technologies, exposure assessment strategies, and multi-pathway analyses used by regulatory agencies. Also covers exposure control options and strategies, including administrative procedures, personal protective equipment, and various engineering control approaches. (F) Hammond, Spear

270B. Toxicology I. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Introduction to toxicology covering basic principles, dose-response, toxicity testing, chemical metabolism, mechanisms of toxicity, carcinogenesis, interpretation of toxicological data for risk assessment, and target organ toxicity. (F) M. Smith

270C. Advanced Pharmacology and Toxicology. (2) Course may be repeated for credit. Three hours of literature review per week. Prerequisites: 172. Current topics in research on chemical effects on biological systems. (SP) Wei

270D. Mathematical and Statistical Aspects of Exposure Assessment. (3) Three hours of lecture per week. Prerequisites: Statistics 142A or consent of instructor. First year calculus. This course provides a quantitative framework for estimating exposure and dose to occupational and environmental toxicants. Statistical theory is applied to the prospective and retrospective estimation of exposure intensity. The same theory is applied to physiologically based pharmacokinetic modeling and estimation of the dose received at target tissue sites in the body. (SP) Nocia, Spear

270E. Quantitative Risk Assessment. (3) Three hours of lecture per week. Prerequisites: 250A, 270A, 270B, or equivalent courses recommended, or consent of instructor. The purpose of this course is to teach the skills necessary for quantitative risk assessment. Weekly readings and group risk assessment project. A number of scientific disciplines are involved in risk assessment, including fields such as toxicology, epidemiology, biochemistry, molecular biology, exposure analysis, environmental chemistry, pathology, medicine, public health, and statistics/biostatistics. This course provides students with the opportunity to learn how these fields are integrated within the process of quantitative risk assessment. Topics covered include the use of human and animal data to classify chemicals with regard to carcinogenicity and other toxic effects; methods for constructing mathematical dose-response relationships using epidemiological studies, animal studies, and the associated statistical, stochastic, and biologically-based models; methods for assessing population exposures, exposure pathways, and risk characterization with the formal analysis of uncertainties. (SP) McKone, A. Smith

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. (F) Eskenazi

271C. Toxicology II. (3) Three hours of lecture per week. Prerequisites: 270B or other introductory toxicology course. Advanced issues in modern day toxicology including molecular aspects of chemical carcinogenesis, reproductive toxicology, toxic effects on the immune, reproductive and other organ systems. (SP) M. Smith

271D. Global Burden of Disease. (2) Two hours of lecture/discussion/ presentation per week. Prerequisites: Graduate standing or consent of instructor. The Global Burden of Disease (GBD) database provides estimates of illness and death by disease type, age, sex, and world region in a consistent and coherent manner. For the first time, the sum of deaths and diseases from individual causes add up to the known to
283. Human Genetics: Applications to Genetic Counseling. (3,3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Multidisciplinary approach to planning for planning of health and injury control. Topics include: pre- and post-natal care; models of role, role, and environment; crime and injury causations; vehicle and occupant dynamics; accident investigation; crash and injury control measures; causes of injuries and countermeasures; policy issues; safety and injury control issues in the context of Civil and Environmental Engineering C291A, (SP) Ragland, Ossenbruggen

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 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 an historical and conceptual framework within which to consider injuries (both intentional and unintentional) as social, and public health problems. Through review of epidemiology and intervention studies, this course reviews the causes and consequences of traumatic injury within developmental, social and economic contexts. This course is designed to present lectures on several aspects of each injury category. Examples of such a database include the following:

- Global Burden of Disease
- Injury Classification
- Injury Prevention
- Injury Policy

This course may be repeated for credit. One to two hours of seminar per week. A discussion of current developments and issues in public health interest to faculty and students. The seminar may vary from semester to semester depending upon current issues and interests. (F,SP) Staff

290. Health Issues Seminars. (1-4) Course may be repeated for credit. One to four hours of seminar per week. A discussion of current developments and issues in public health interest to faculty and students. The seminar may vary from semester to semester depending upon current issues and interests. (F,SP) Staff

291. Preparation for Public Health Practice. (1-3) Course may be repeated for credit. One to three hours of lecture per week per unit. Must be taken on a satisfactory/un satisfactory basis. This seminar features current developments and issues in public health practice experience. This course complements the core curriculum by preparing students for Public Health Practice field work. Topics may include:
- Focus group facilitation, strategic planning, legislative process, leadership, and oral and written communications.
(F,SP) Staff

292. Seminars for M.P.H. Students. (1-4) Course may be repeated for credit. One to four hours of seminar per week. Current topics and special issues in the health field. (F,SP) Staff

293. Doctoral Seminar. (1-4) Course may be repeated for credit. One to four hours of seminar per week. Discussion and analysis of dissertation research projects, as well as of conceptual and methodological problems in planning and conducting health research. (F,SP) Staff

295. Seminars. (1-4) Course may be repeated for credit. One to four hours of seminar per week. Discussion and analysis of dissertation research projects, as well as of conceptual and methodological problems in planning and conducting health research. (F,SP) Staff

299. Independent Research. (1-12) Course may be repeated for credit. Independent study and research. (F,SP) Staff

Prerequisites: Acceptance into Preventive Medicine Residency Program or consent of instructor. Integration and discussion of academic concepts in relation to practical issues in public health and professional practice in preventive medicine. (F,SP) Rutherford, Seward, Stilwell

288. Preventive Medicine Residency Seminar. (1-4) Course may be repeated for credit. Two hours of seminar per week with additional credits for supervised experience in public health and/or preventive medicine settings. Prerequisites: Acceptance into Preventive Medicine Residency Program or consent of instructor. Integration and discussion of academic concepts in relation to practical issues in public health and professional practice in preventive medicine. (F,SP) Rutherford, Seward, Stilwell

Public Policy

(Richard & Rhoda Goldman School of Public Policy)

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http://gppp.berkeley.edu/

Dean: Michael Nacht, Ph.D.
Assistant Dean: Richard R. Treviño, M.Ed., J.D.

Professors
- Eugene Bardach, Ph.D., University of California, Berkeley. Policy analysis, implementation, social theory.
- Richard Scheffler, Ph.D., New York University. Health economics, urban planning, demography.
- Eugene Smolensky, Ph.D., University of Pennsylvania. Public policy, economics, health policy, nonprofit organizations.
- Michael C. Brown, Ph.D., University of Chicago. Quantitative social science.
- Sally J. Glaser, Ph.D., University of California, Berkeley. Economics, health policy, nonprofit organizations.
- Barry S. Rittel, M.A., Ph.D., University of California, Berkeley. Environmental and resource economics, philosophy, ecological economics.
- 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
- John M. O'Keefe, Ph.D., Harvard University. Management, urban studies, arts and cultural policy, environmental policy.
- John N. O'Keefe, Ph.D., Harvard University. Microeconomics, public finance.
- Richard Scheffler, Ph.D., New York University. Health economics, health policy, nonprofit organizations.
- Suzanne Scotchmer, Ph.D., University of California, Berkeley. Economics, health policy, nonprofit organizations.
- Eugene Smolensky, Ph.D., University of Pennsylvania. Public policy, economics, health policy, nonprofit organizations.
- Michael R. Treviño, Ph.D., University of Minnesota, History, higher education.

Associate Professor
- Jane Stauden, Ph.D., Princeton University. Health policy and economics, urban planning, demography

Assistant Professor
- Jack Glaser, Ph.D., Yale University. Social and political psychology, prejudice and discrimination, hate crime

Affiliated Faculty
- Martin Landau (Emeritus, Political Science), Ph.D., New York University

Contemporary society is increasingly complex. Its key characteristics include globalization of the world economy; rapid technological change derived turbulently from biological and environmental changes; and the rapid growth of the information economy. This complexity has led to a dramatic increase in the number of public policy questions that society must consider. Public Policy / 401

Upper Division Courses

IDS 114A-114B. Advancing in Aging. (2,2) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: High school biology and chemistry. This interdisciplinary course will single out specific topics in aging of great current interest and interest in recent years in each of the topics (biomedical, health, socio-economic, legal, and ethical). Each semester a different topic will be presented. Interested students with special expertise in these areas will participate. Sponsoring departments: Molecular and Cell Biology, Optometry, Public Health, and Social Welfare. (F,SP) Timiras

IDS 130. Seminar on Social, Political, and Ethical Issues in Health and Medicine. (2) One hour of lecture per week. Must be taken on a passed/not passed basis. An interdisciplinary approach to health and medicine. Guest lecturers will speak on the social, political, and ethical aspects of health and medicine; students will then discuss and present analyses of the reading materials as well as issues raised by the speakers. Sponsoring departments: Public Health and Education. (F) Duhl
Governments; reduced political support in the United States for government-funded programs for the disadvantaged in the context of a society that is increasingly racially diverse; fundamental change in the management of health care; ethnic conflict within many countries that has led to millions of fatalities; and the proliferation of weapons of mass destruction. These characteristics demand sophisticated tools, approaches, and methodologies that implement policy changes. Public-private partnerships are increasingly common responses. As a consequence, the need for well-trained policy analysts and managers remains very strong.

The Goldman School of Public Policy prepares students to contribute to public life, to public and private sectors, and to advance professional study; and to the informed public. The program provides students with the benefits of and access to the resources of the entire Berkeley campus. Second-year students can take elective courses from the full array of campus offerings.

Undergraduate Courses

The undergraduate courses in public policy deal with the substance of public policy, how it is made, how it works, 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 context, students gain a greater sensitivity to the forces which 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 these courses other than the courses unless specifically noted otherwise in the course descriptions. The training provided by the courses is useful to those interested in combining the substantive and social sciences with the immediacy of contemporary problems; to those considering professional study; and to the informed and politically aware citizen.

Minor Program. The undergraduate minor in public policy introduces students from other departments and colleges to the field and practice of policy analysis. The minimum requirements are five courses in public policy, at least three of which must be upper division. All classes must be taken at the School of Public Policy.

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 some 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, economic, social science, 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 from the professional schools and academic disciplines should find their strengthened analytical capabilities of direct use when applied to their own field of concentration.

Master’s Degree in Public Policy

The professional degree, the Master of Public Policy, is designed to provide students with the knowledge, analytical skills, and sensitivities needed to conduct public policy studies. Students from diverse disciplinary backgrounds are accepted into this program. Those completing the master’s program are qualified to take on a variety of significant policy roles in the U.S. and abroad. They work within the public sector at all government levels, in nonprofit organizations, and in private consulting firms. Examples of jobs include staff analyst in a regulatory agency or planning office, special assistant to a senior executive, legislative aide, project officer or program manager in an operating agency or staff member in a nonprofit management consulting or policy research firm.

The two-year master’s degree program consists of a required first-year core curriculum, a summer internship, and a second year devoted primarily to elective courses and a policy study of the student’s choice. The core curriculum includes courses in political and organizational analysis, economic analysis, equity techniques, legal analysis, and a workshop where students perform policy studies on selected issues.

Coordinated Degree Programs with Other Berkeley Colleges and Schools

The M.P.P. may be earned in combination with an advanced degree from the following Berkeley schools and colleges under a coordinated program:

- M.P.P./J.D. with the Boalt 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
- M.P.P./M.S. with the College of Engineering

Ph.D. in Public Policy

The Ph.D. program prepares students for careers in advanced policy research in academic institutions, research institutes, and government agencies. The Ph.D. program is oriented toward the generation of new knowledge, theories, and methodologies in public policy analysis. The program is small and admission is highly selective.

Further Information

Brochures and information on admissions procedures and student financial assistance are available from the Richard & Rhoda Goldman School of Public Policy, University of California, Berkeley, 2507 Hearst Avenue #7320, Berkeley, CA 94720-7320.

Lower Division Courses

1. Public Policy in California. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Course open to freshmen and sophomores only. An introductory introduction to some of the major policy issues facing the American voter. Emphasis is on how difficult it is to arrive at an informed decision—not on determining what that decision ought to be. The roles of politics, economics, law, technical issues of administration and implementation, and ethics will be illustrated. Special attention will be given to the fiscal choices of states. This course includes formal lectures and in-class policy exercises. Further reading will be assigned. (SP) Staff

2. Perspectives in Policy. Preparatory to or concurrent with upper-division policy courses. Topics change from semester to semester. Section 1 to be graded on a pass/no pass basis. Section 2 to be graded on a pass/not pass basis. (SP) Staff

3. Freshman/Sophomore Seminar. (2) Two hours of seminar per week for 10 weeks. Sections 1-2 to be graded on a letter-grade basis. Sections 3-10 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. Enrollment limits are limited to fifteen students, but the suggested limit is 25. (F.S.P) Staff

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.S.P) 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 proposing public policy, with an emphasis on policy analysis and application to particular cases and problems. Diverse policy topics, including environmental, health, education, communications, safety, and arts policy issues, among others. (F.S.P) Staff

117A. 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 by and 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 examine the variety of ways of responding to these issues with different racial and ethnic groups. This course satisfies the American cultures requirement. (SP) Kirp

156. Program and Policy Design. (3) Three hours of seminar per week. Studio/laboratory in the design of nonphysical environments. Complements courses 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 involving 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. (3) 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. (SP) O’Hare

158. Risk and Uncertainty in Public Policy. (3) Three hours of lecture per week. Risk and uncertainty are at the core of many of our major social problems, including sexually transmitted diseases, medical technology, food safety, street crime, hazardous wastes, alcohol and drug use, nuclear energy, earthquakes, and terrorism. This course examines how individuals manage risk and uncertainty in their private lives, and how societies manage risk and uncertainty through public policy. The course evaluates how policies affect under risk and uncertainty and contrast these approaches with more formal methods recommended by experts. We will then examine the implications of these lay and expert perspectives for public policies involving...
ing health, nutrition, employment, transportation, crime, and health. This course is recommended by the Psychology department for its major and minors. (SP) MacCoun

159. Applied Policy Analysis: Criminal Justice Issues, (3) Three hours of lecture per week. Prerequisites: 101 or equivalent or consent of instructor. Together, the use of illicit drugs, alcohol, and tobacco cost us over $200 billion a year in losses due to medical treatment, accidents, and crime. Despite many pharmacological, behavioral, and legal parallels, policies regarding these three classes of substances have evolved independently. Critics of the current drug regime call for prohibition. The purpose of this course will be to evaluate these debates from a policy analytic perspective, drawing on theory and research from the behavioral sciences, epidemiology, and economics. (F) MacCoun

160A. AIDS and the American Culture, (4) Three hours of lecture per week. Prerequisites: Economics 100A or 101A or equivalent. Lectures will cover extensions and applications of the economic theory and methodology presented in the course. Case studies of the techniques will be drawn from diverse policy applications: welfare reform, national health insurance, public employment, public sector shortage; public regulation and others. (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 poor children and families. Introduction to child and family policy, and study of specific issue areas, such as income transfer programs, housing, health care, and child abuse. Also listed as Demography C164. (F) Mauldon

170. Ethics in Public Policy, (4) Three hours of lecture per week. Those who seek to serve the public’s multiple and often contradictory interests are constantly confronted with questions of values and moral reasoning. In posing and sharpening those questions, this course provokes reflection on the challenges and responsibilities of policy making in a democracy. Using case studies ranging from abortion to AIDS and nuclear power to Iran-Contra, the course emphasizes the importance of clear reasoning about the values involved in public policy problems, and invites and helps frame the right questions about the responsibilities of a career in public service. (F) Kirp

172. Health Care Policy, (4) Three hours of lecture and one hour of discussion per week. Examines the structure, conduct, and performance of the U.S. health care industry. Course is a vehicle for considering problems that arise in the design and implementation of health care policy specifically, and public policy analysis generally. The course uses the methods of many disciplines, but particularly those of economics and ethics, to analyze various contemporary health care issues and to weigh the associated cost-benefit proposals. The focus is on the U.S. system, but international comparisons will also be explored. (SP) Staff

175. Science and Technology Policy. (4) Three hours of lecture and one hour of discussion per week. This course will consider the implications of scientific and technological advance, particularly the challenges for democratic policymaking. The course will explore issues ranging from the role of science in society to questions of innovation (e.g., public/private funding, intellectual property protection), the medley of science/technology oversight mechanisms that are the foundation of “good” science policy, and the question of the correct governmental role in the field. (F) Kirp

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 understanding of the effects and consequences of public sector budgeting, its processes and participants, and the potential impacts of various reforms. Students must have completed 289. This course can be applied to the political science major. (SP) Ellwood

180AC. and the American Culture, (4) Three hours of lecture per week. Prerequisites: Economics 100A or 101A or equivalent. Lectures will cover extensions and applications of the economic theory and methodology presented in the course. Case studies of the techniques will be drawn from diverse policy applications: welfare reform, national health insurance, public employment, public sector shortage; public regulation and others. (F) Friedman

184. The Economics of Public Problem-Solving, (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 100A or 101A or equivalent. Lectures will cover extensions and applications of the economic theory and methodology presented in the course. Case studies of the techniques will be drawn from diverse policy applications: welfare reform, national health insurance, public employment, public sector shortage; public regulation and others. (F) Friedman

188. Policy Issues in Urban and Industrial America, (3) Three hours of lecture per week. Prerequisites: Math 1A-B and Economics 100A or consent of instructor. This course will cover (1) Biotechnology: History and description of the industry, patent law, and patent races (the Economics literature), regulation, ethical issues; (2) Consumer Product Safety: We will discuss the economics literature on market forces can be trusted to ensure efficient quality and safety, American regulation of product safety, and relevant liability law; (3) Siting Hazardous Wastes: recent proposals to solve this problem, as well as the extent of the problem.

190. 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. Course examines current problems and issues 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) Staff

198. Group Study, (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Group study of special 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 passed/not passed 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) Staff

Graduate Core Curriculum

Note: Core curriculum courses are open only to students in the School of Public Policy.

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 will integrate various social science disciplines and policy analysis. Among the academic terms, students will apply knowledge of politics, economics, sociology, and quantitative methods in the analysis of public policy. Throughout the academic term, students will apply the techniques of formal analysis to evaluate projects and programs. Course will include the preparation of a major paper for a client. (SP) Kirp

205. Advanced Policy Analysis, (3) 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. Research projects will apply the interdisciplinary methods, approaches, and perspectives studied in the core curriculum. (SP)

210. The Economics of Public Policy Analysis, (3,4) Four hours of lecture/discussion and one hour of session per week. Prerequisites: Open only to students in the Graduate School of Public Policy. Theories of microeconomic behavior of consumers, producers, and bureaucrats are developed and applied to specific policy areas. Ability to analyze the effects of alternative actions in terms of 1) the efficiency of 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) Friedman

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. Focuses on legal aspects of policy by exposing students to primary legal materials, including court decisions and legislative and administrative regulations. Skills of interpretation and legal draftsmanship are developed. Relationships among law-making agencies and between law and policy are explored through case-based and other studies. (SP)

230A-230B. Political and Agency Management Aspects of Public Policy, (4,4) Four hours of lecture/discussion per week. Prerequisites: Open only to students in the Graduate School of Public Policy. This course examines the political and organizational factors involved in decision making and choosing among alternatives, gaining acceptance, assuring implementation, and coping with unanticipated consequences. Materials will include case studies, theoretical, empirical, and interpretive works from several disciplines. (F,SP)

239A-239B. Decision Analysis, Modeling, and Quantitative Methods, (4,4) Four hours of lecture per week. Prerequisites: Open only to students in the Graduate School of Public Policy. These courses in the use of quantitative techniques in public policy analysis: computer modeling and simulation, linear programming and optimization, decision theory, and statistical and econometric analysis of policy-relevant data. The student develops a facility in distilling the policy relevance of numbers through an analysis of case studies and statistical data sets. (F,SP)

250. Introduction to Public and Nonprofit Management, (3) Three hours of seminar per week. For upper division students interested in a career as a higher-level manager: motivating individual performance; channeling the work of formal and informal groups; designing effective organizational structures. Concepts and thinking methods are introduced in written exercises and selected social science reading. Policy content varied, e.g., health, environmental management, transportation, criminal justice, urban planning, race relations, and the arts. Application of special topics according to student interest. (SP) Staff

Graduate Courses

251. Microeconomic Organization and Policy Analysis, (3) Two hours of seminar and one hour of concentration per week. Prerequisites: Administration 101B or Economics 200A or equivalent, and consent of instructor. Research seminar to develop public policy analyses based on microeconomic theories of organization and institutional design. Applications of demand theory, behavioral theory of regulatory agencies and bureaucracies, and productivity in the public sector. (F) Friedman

252. The Politics of Policy Advising, (3) Three hours of seminar and one hour of conference per week. An introduction to the political environment surrounding policy advising and the application of analytical information to policy-making. By exploring the interactions of clients and advisors, engineers, planners, policy analysts, and other professionals, we will be in
a better position to assess the likely effectiveness of their advising. (SP) Ellwood

256. Program and Policy Design. (4) Three hours of seminar per week. Formerly 206. Studio/laboratory in the design of nonphysical environments. Complements courses 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. (3) Three hours of lecture per week. Formerly 208. Survey of government policy toward art, commerce in the arts, and the role of the arts in contemporary society. 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 at least one session before the end of the quarter. (SP) O'Hare

259. Cost-Benefit Analysis. (3) Three hours of seminar per week. Prerequisites: Calculus and Intermediate Microeconomics or consent of instructor. This course introduces the concepts and applications of cost-benefit analysis, and analyzes in depth some important applied aspects such as endogenous discount. (F)

260. Applied Policy Analysis: Criminal Justice Issues. (3) Three hours of lecture per week. Prerequisites: No criminal justice course work required or assumed; introductory statistics recommended. Formerly 219. Course organized around current controversies in criminal justice policy, such as gun control, drug legalization, and "three-strikes-and-you-are-out" sentencing laws. Includes introductory presentations by the instructors on major criminological theories, trends in crime and punishment, and a historical survey of criminal justice policy. Emphasis on in-depth examination and discussion of current controversies studied by students during the quarter. Graduate level of 153. (SP) Coelho

261. Reforming Education for the Next Generation. (4) Three hours of seminar per week. Prerequisites: Consent of instructor. While education policy has been repeatedly reshaped in the past generation, certain themes persist: the value of choice (for families and cultures), promoting excellence. This seminar explores these central themes, then analyzes current reform strategies—including voucher programs and magnet schools, outcome equalization, and systemic reform of instruction—to implement them. (F) Kirp

262. Drug, Tobacco, and Alcohol Policy. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Together, the use of illicit drugs, alcohol, and tobacco are the leading causes of death and disability. Policy makers and the public are concerned with the problems that arise due to medical treatment, accidents, and crime. Despite many pharmacological, behavioral, and economic parallels, policies regarding these three classes of substances have evolved independently. Critics of the current drug regime call for legalization; critics of the current tobacco regime call for prohibition. The purpose of this course will be to evaluate these debates from a policy analytic perspective, drawing on theories and research from the behavioral sciences, epidemiology, and economics. Graduate level of 162. (F) MacCoun

264. Striving for Excellence in Public Management. (3) Three hours of seminar per week. Using case materials, students assume the roles of managers trying to improve the performance of various public agencies. Cases are drawn from a variety of policy areas, but emphasize public health, education, social services, and land use. Middle and top management roles are emphasized. (F) Bardach

265. Policies for Youth. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. This seminar deals with the transition between youth and adulthood in advanced industrial societies. The seminar will consider some of the major issues around this transition and efforts that are being made or might be made by public and private agencies to deal with these problems in the US and abroad. (SP) Mauldin

266. Health Policy in the Public and Private Sectors. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. This seminar will cover health care policy topics related to health economics. An examination of the government policy in health and the role of the private market. Topics include health care finance and insurance, profit and nonprofit health care delivery, adequacy of the supply of health care professionals. (SP) Banks

267. Evaluating Welfare, Health, and Education Programs. (3) Three hours of seminar per week. Prerequisites: Course in inferential statistics or consent of instructor. This course is for students who want to study the broad principles and the practical problems of program evaluation. Topics will include the use of different types of evaluations; "process" evaluations; data sources and diverse data collection methods; the design and execution of data in evaluation; sampling, sample sizes, power analysis; common statistical tests used in evaluations; assessing the strengths and weaknesses of published evaluations; methods of measuring program costs; ethical issues in evaluation. (SP) Mauldin

269. Public Budgeting. (4) Three hours of lecture/discussion per week. Formerly 209. Public sector budgeting is an activity that 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 an understanding of the effects and consequences of public sector budgeting. Processes and participants, and the potential impacts of various reforms. Graduate level of Public Policy 179. (F) Ellwood

272. Health Care Policy. (3) Three hours of lecture and one hour of discussion per week. Examines the structure, conduct, and performance of the U.S. health care system. Course is a vehicle for considering problems that arise in the design and implementation of health care policy specifically, and public policy generally. It is designed for students interested in health and the role of the private market. Topics in health and the role of the private market. Topics included 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. (SP) Staff

277. Knowing and Valuing in Public Policy. (4) Three hours of seminar per week. Prerequisites: Consent of instructor. This seminar confronts a series of fundamental policy problems. How does one position oneself in relation to the problem being analyzed? How does one choose among competing kinds of data and competing models of individual and collective behavior? What role do normative judgments play? Discussions and papers will link seminal readings to concrete policy issues. (F) Krip

278. Psychology and Public Policy. (3) Three hours of lecture per week. This course surveys contributions to policy analysis provided by the behavioral sciences (especially social and cognitive psychology). The objectives of the course are (a) to make you an informed consumer of behavioral science research—enthusiastic yet critical, (b) to understand how and when socially behavior can be predicted, understood, and/or influenced, and (c) to understand the psychological processes that influence judgment by policymakers and policy analysts. (F) MacCoun

279. Research Design and Data Collection for Public Policy Analysis. (3) Three hours of seminar per week. Prerequisites: At least one year of statistics. Public policy analysis requires a sophisticated understanding of a variety of data types. Empirical arguments and counterarguments play a central role in policy debates. Quantitative analysis courses teach 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) MacCoun

280. The Uses and Abuses of Social Science in Public Policy Making. (3) Two hours of seminar per week. Examines applications of social science research in public policy making by government through case materials in the field of human resources as policy area. Links between research and the dissemination and application of research findings will be emphasized. (SP) Friedman

298. Special Topics in Public Policy. (1-4) Course may be repeated for credit with consent of instructor. Six hours of lecture per week depending on topic. Course examines current policy problems and issues 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) Staff

299. Supervised Research Colloquium. (1-9) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Open to qualified graduate students wishing to pursue special study and research under direction of a member of the staff. (SP, F,SP)

300. Independent Study in Preparation for the Master's Essay. (3) Credit to be awarded on completion of the Master's essay. Prerequisites: Consent of faculty. By arrangement with faculty. Open only to qualified second-year graduate students working toward the M.P.P. degree. (SP)

602. Individual Study for Doctoral Students. (1-10) 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 op-
Range Management
(College of Natural Resources, Interdepartmental Graduate Groups)

Office: 133 Mulford Hall, (510) 642-6410
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. Barsoti, Ph.D. Rangeland ecology and management (Environmental Science, Policy, and Management)
Donald L. Dahlsen, Ph.D. Forestry entomology, biological control (Environmental Science, Policy, and Management)
William E. Dietrich, Ph.D. Hillslope and fluvial geomorphology (Earth and Planetary Science)
Sally G. Firestone, Ph.D. Conservation policy, public land administration (Environmental Science, Policy, and Management)
Mary K. Firestone, Ph.D. Soil microbiology, nutrient cycling (Environmental Science, Policy, and Management)
Louise P. Fortmann, Ph.D. Natural resource sociology (Environmental Science, Policy, and Management)
†Joe R. McBride, Ph.D. Forest ecology (Environmental Science, Policy, and Management)
†Date R. McCollough, Ph.D. Wildlife biology and management (Environmental Science, Policy, and Management)
John M. Radel, Ph.D. Natural resource and environmental policy (Environmental Science, Policy, and Management)
†William H. Garden (Emeritus), Ph.D. Soil physiology, soil biophysics (Environmental Science, Policy, and Management)
Harold F. Heady (Emeritus). Ph.D. Range ecology and management (Environmental Science, Policy, and Management)
John A. Helms (Emeritus). Ph.D. Silviculture (Environmental Science, Policy, and Management)
†William Z. Linder (Emeritus). Ph.D. Mammalogy and ecology (Integrative Biology)
†Robert E. Martin (Emeritus), Ph.D. Wildlife fire control and management (Environmental Science, Policy, and Management)
†Thelma E. Rowell (Emeritus), Ph.D. Primate behavior and reproductive cycles (Integrative Biology)

Associate Professors
John Battié, Ph.D. Forest community ecology (Environmental Science, Policy, and Management)
Carla D’Antonio, Ph.D. Plant population biology (Integrative Biology)
Lyne Hunsberger, Ph.D. Rangeland ecology and conservation (Environmental Science, Policy, and Management)
†John D. Rakde, Ph.D. Geography, geographical information systems in landscape analysis and environmental planning (Landscape Architecture and Environmental Planning)

Assistant Professor
Tracy L. Benning, Ph.D. University of Colorado, Landscape ecology

Associate Adjunct Professor
Adina M. Mererelender, Ph.D. Ecology, conservation biology, landscape ecology (Earth and Planetary Science, Policy, and Management)

Specialist
Richard B. Standford, Ph.D. Wildland economics and management (Environmental Science, Policy, and Management)

Graduate Adviser: Ms. Allen-Diaz.

Program Overview
The graduate program in range management is administered by an interdepartmental group of faculty members from the Department of Environmental Science, Policy, and Management and related departments at UC Berkeley. The program prepares students 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 rehabilitation, wetland ecology, and rangeland policy.

Excellent laboratory and field facilities are available for student research. These include several experimental range properties and large wildland ranges easily accessible from Berkeley. The faculty are 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, (510) 642-2363
http://ls.berkeley.edu/ug/sreligious

Student Affairs Faculty (Undergraduate and Interdisciplinary Studies, 301 Campbell Hall, 642-2363

Advisory Committee
Thomas Brady (History)
Gerard Caspary (History)
Vassula De Silva (South and Southeast Asian Studies)
Alun Dunides (Anthropology)
Susanna Elm, Director (History)
Marianne Ferme (Anthropology)
Robert Goldman (South and Southeast Asian Studies)
Erich Geiger (History)
Ronald Hendel (Near Eastern Studies)
Steven Jacobs (Near Eastern Studies)
Robert Reed (Geography)
Nancy Rutledge (Comparative Literature and English)
Randolph Starn (History)
David Sirotna (Near Eastern Studies)
Reginald Zerbe (Near Eastern Studies)
William Brown (Comparative Literature and English)
Hubert Dreyfus (Philosophy, Emeritus)
Lewis Lancaster (East Asian Languages and Cultures, Emeritus)

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 or religious tradition of personal interest. 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 symbolic and mythic dimensions of world cultures, the religious aspects of human societies, and existential issues. It is not restricted to those who have a religious background or are pursuing a religious vocation. Members of the major will be challenged to view religion multiculturalism 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 and courses that examine thematic issues and cross-cultural phenomena such as myth, ritual, transformative experience, and comparative ethics. The religious traditions that may be emphasized include the following:

- Buddhism: East Asian Languages (Chinese) 120, 122, 130. Additional courses: East Asian Languages (Chinese) 140, 142, 160. Recommended: Students intending to do graduate work in Buddhism should study Tibetan, Chinese, Sanskrit, Tamil, or Hindi.

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. Students wishing to receive a minor in religious studies should register in the group major office and work out a plan of study with an advisor. Students must take Religious Studies 90A and 90B and five upper division courses chosen from an approved list on file in the group major office. All courses must be completed on a letter-grade basis. A minimum of three of the five upper division courses must be completed with a grade of C. 

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
must be completed at Berkeley, and a minimum overall grade-point average of 2.0 is required.

Honors Program. Students may elect to attempt graduation with honors if they have done well in both general university work and the major courses at the beginning of their senior year. Required are upper division work in the language relevant to the student’s academic program (with consent of adviser) and the submission of a bachelor’s thesis as a culmination of one or two semesters of the sequence, Religious Studies H155A-H155B. 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 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 limited to fifteen freshmen. (F,S,P) Staff.

90A-90B. Introduction to Religious Studies. (4/4) Three hours of lecture per week. Two-semester sequence designed as a survey of major religious traditions and an introduction to major themes in the comparative study of religions. Methodology and methodological issues in the history and study of religion will be intertwined with the exploration of intercultural religious phenomena such as ritual, myth, the concept of the sacred, religious community, and ethical guidance. Staff.

90B. Introduction to Religious Studies. (4) Three hours of lecture per week. Selected introductory topical subjects in the study of religion. Also listed as South and Southeast Asian Studies C51. (SP)

**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 inscribed texts and documents. Also listed as Near Eastern Studies C104.

C108. Scandinavian Myth and Religion. (4) Three hours of lecture per week. Religious beliefs and practices during the Viking Age in Scandinavia and their manifestations in later recordings. Readings and discussion in English. Also listed as Scandinavian C160. 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, to the historical narratives in which such beliefs are embedded, and to the methodology of investigating ancient and medieval belief systems. Also listed as Celtic Studies C168. Staff.

C111. Rhetoric of Religious Discourse. (4) Three hours of lecture per week. Consideration of the rhetoric of hermeneutics or biblical interpretation with special emphasis on the mythological, symbolic, and allegorical language as the bearer of persuasive intention. Also listed as Rhetoric C131. Staff.

C112. Ethical Theories. (4) Three hours of lecture and one hour of discussion per week. The fundamental concepts and problems of morality examined through the study of classical and contemporary philosophical theories of ethics. (F)

115. Mysticism. (4) Three hours of lecture and one hour of discussion per week. Studies in the literature and piety of various mystical traditions, including readings of scripture, lyrical poetry, spiritual discourse, autobiography, etc. The relationship of several forms of mysticism to their religious traditions will be treated. Staff.

C116. The Mystical Tradition in Literature. (4) Three hours of lecture per week. Formerly 116. A survey of the major concepts in the philosophy of mysticism and their expression in literary form. Examples of the mystical tradition in the Eastern and one Western tradition; emphasis on problems such as love and sex, social justice and individual fulfillment.

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; political and religious eschatology; Paul and his interpreters. Elm.

120B. Origins of Christianity. (4) Two hours of lecture and two hours of seminar per week. Prerequisites: 90A or 90B, History 4 or consent of instructor. Varieties of early Christianity. Conflicts of interpretation of both Old Testament and Christian message; Macion; the Gnostics; virginity; martyrdom; radical prophecy; the idea of heresy. Elm.

123. Europe in the Middle Ages. (4) Three hours of lecture and one hour of discussion per week. Formerly 123. Late Empire to the Investiture Conflict. Formulation of a West European civilization; stress on tribal settlements, the Carolingian Empire, and Christian foundations. Staff.

C124. The Renaissance and the Reformation. (4) Three hours of lecture and one hour of discussion per week. Formerly 124. European history from the fourteenth to the middle of the seventeenth century. Political, social, and economic developments during this transitional period will be examined, together with the rise of Renaissance culture, and the religious upheavals of the sixteenth century. Also listed as History C157.

125. The Reformation. (4) Three hours of lecture and one hour of discussion per week. This course is about the Reformation, the upheaval in Christendom during the 16th century. It aims to uncover the causes, processes, and outcomes that transformed the western Christian civilization, from the late Late Empire and early Middle Ages. Staff.

130. Introduction to Judaism. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 90A or 90B or consent of instructor. The nature and development 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 development of the Jewish people from the legacy of ancient Near Eastern myth and religion, the history of Israelite religion, the literary features of biblical narrative, and the Dead Sea Scrolls. Also listed as Near Eastern Studies C135 as a seminar. Staff.

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 Greco-Roman Jewish identity and thought, and literature. Also listed as Near Eastern Studies C133 and Undergrad Interdisciplinary Studies C153. Staff.

C134. 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 culture and civilization. It covers the middle ages and the early modern period, including Kabbalah, medieval poetry, halakhic, ethical literature, Jewish philosophy, and the Italian Jewish renaissance. Also listed as History C175A and Undergrad Interdisciplinary Studies C154. Staff.

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 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, 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 through a course through the perspectives of Eastern European Jewish narratives alongside the more familiar Ashkenazi perspective. Also listed as History C175B and Undergrad Interdisciplinary Studies C155. Staff.

C156. Early Chinese Thought. (4) Three hours of lecture per week. An examination of early Chinese thought via a study of representative thinkers and texts. Topics include pre-Ch’ing Confucianism and Taoism, development of Confucian thought in the Han dynasty, and of Taoist thought in the Wei-Ch’in dynasties, development of Buddhist thought.

C157. Later Chinese Thought. (4) Three hours of lecture per week. This course begins with an introduction to early Chinese thought, including the development of Confucian, Taoist, and Buddhist thought up to the nineteenth century. It then continues with an in-depth examination of the evolution of Confucian thought in response to and under the influence of Taoism and Buddhism, via a study of representative thinkers from the Sung, Ming, and Ch’ing dynasties. Shun.

C161. 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 teaching it by separate religious traditions facilitates comparisons and promotes an understanding not only of the differences among these religions but also the similarities. It is taught in small seminar setting. Staff. Also listed as South Asian C127. 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 the Tamil-speaking south—its knowledge of languages, traditions, and practices. Also listed as South Asian C141. Staff.

C163. Religious Identities in South Asia. (4) Three hours of lecture per week. Formerly 163. The aim of this course is to explore the making of religious identities in India after the coming of Islam to the subcontinent. Topics covered include the formation of Sufi siyasi, the mystic kingship of Akbar, Krishna bhakti, Kabir, Nanak, Tulsiidas’ Ramcharitmanhas and the Ramila performance tradition, women’s religion, Islamic and Hindu reform movements in colonial India, and the intersection of modern nationalisms and religious identity. Also listed as South Asian C128. Staff.

C165. Hindu Mythology. (4) Three hours of lecture per week. Formerly 140. Literary and religious aspects of Hindu myths. Reading of selected mythological texts and their translation. Also listed as South Asian C140. Goldina.

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 Ma...
habarata and the Ramayana in translation, selected readings from the corpus 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 issues relevant to the study of the poems and their extraordinary influence on 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

171AC. 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 create within religious communities and the mechanisms they use to ease such tensions. Special attention will be given to the ways these communities sought to preserve traditional beliefs and practices in the face of trends toward cultural accommodation as well as to how these communities resisted assimilation and transformed their communities and their circumstances. Theoretically, the concept of the cultural Resistance/Adaptation model— Isolation/ accommodation/conflict/transformation—will frame the course lecture and discussion materials. This course satisfies the American cultures requirement. Staff

172AC. World Religions 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 experiences of Arab, African, and Asian immigrant communities. Since ethnicity and issues of race play a defining role in the development of these communities, the theoretical focus of this course will center on the tensions such issues of racial and cultural difference create, the ways these communities addressed their cultural alienation, and the means they used to ease such tensions. Special attention will be given to the ways these communities sought to preserve traditional beliefs and practices in the face of trends toward cultural accommodation as well as to how these communities resisted assimilation. This course satisfies the American cultures requirement. Staff

175. Intellectual History of the United States Since 1865. (4) Three hours of lecture and one hour of discussion per week. This course surveys the development of American thought and culture from the end of the Civil War to the present. Among the episodes to be addressed are the decline of Protestant cultural hegemony in relation to science and to the coming of Jewish intellectuals. Staff

175T. Political Philosophy of Martin Luther King, Jr. (4) Three hours of lecture per week. Using the thought and actions of Martin Luther King, this course examines the major events of the Civil Rights Movement. Readings include original works by King as well as secondary sources, with a special emphasis on African American religion, nonviolence, and integration. Also listed as Sociology C124. (F,SP) Sperlich

C185B. Religion and Politics. (4) Three hours of seminar and one hour of discussion per week. Prerequisites: Political Science 163A and consent of instructor. Formerly 185B. The interaction of religion and politics. The primary focus is the impact of religion on modern American politics. This core will be supplemented by historical and comparative analyses of the role of religion in politics. Also listed as Political Science C163B. Sperlich

190. Topics in the Study of Religion. (3) Course may be repeated for credit. Topics 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. Successful completion of the 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 http://rhetoric.berkeley.edu/ Chair: Judith Butler, Ph.D.

Professors

Daniel Boyarin, Ph.D. Jewish Theological Seminary of America. Talmud, Jewish Mysticism, and Modern Jewish Thought

Judith Butler, Ph.D. Yale University. Philosophy, literature, social and political thought, feminist theory

Anthony J. Cascardi, Ph.D. Harvard University. Philosophy, literature

Carol J. Clover, Ph.D. University of California, Berkeley. Oral literature, orality and literacy, medieval literature, film and popular culture, feminist theory

David Cohen, Ph.D. Cambridge University. J.D. University of California. Comparative law and rhetoric

William Fitzgerald, Ph.D. Princeton University. Latin literature and society, lyric poetry, classical tradition, music and literature

Vicka Kohn, Ph.D. Yale University. Renaissance literature, rhetoric and poetic theory, history of rhetoric

Trinh T. Minh-ha, Ph.D. University of Illinois, Film aesthetics. Film criticism and theory, Third World cinema, women in film, ideology and film

Kaja Silverman, Ph.D. Cambridge University. Law and society, humanism, feminist theory

Linda Williams, Ph.D. University of Colorado. Film history and genre, melodrama and pornography, feminist theory, visual culture

Robert L. Beloof (Emeritus), Ph.D. Northwestern University. Prosody, modern poetry

Seumour B. Chatman (Emeritus), Ph.D. University of Michigan. Narrative semiotics

Leonard Nathan (Emeritus), Ph.D. University of California. Poetry, translation

Barbara Shapiro (Emeritus), Ph.D. Harvard University. Early modern literature, humanism

Thomas D. Sipan (Emeritus), Ph.D. Northwestern University. Renaissance literature, humanist rhetoric

Todd G. Wolly (Emeritus), Ph.D. University of Iowa. The novel, Conrad, imperialism

Associate Professors

Marianne Carosso, Ph.D. University of California. Law, philosophy, social thought

Frederick Delanty, Ph.D. Princeton University. Political theory, philosophy, theories of interpretation

Shannon Jackson, Ph.D. Northwestern University. Performance theory, oral performance, 20th-century theatre and performance art

Michael Mascuch, Ph.D. Cambridge University. Literature and society

Daniel F. Meila, Ph.D. Harvard University. Oral literature, Celtic, folklore

Assistant Professors

David Bates, Ph.D. Bates College, Chicago. European intellectual history, 18th-19th century Enlightenment thought, political and revolutionary discourse, philosophy of history

Pheng Cheah, Ph.D. Cornell University. 20th century continental philosophy and critical theory, postcolonial theory and anthropo- philology postcolonial literatures theory of globalization philosophy and literature, legal philosophy, social and political thought, feminist theory

Carolinn Munthe, Ph.D. Harvard University. Law and legal rhetoric (classical and late antique), history of political thought, Roman intellectual history, development of canon law and Christian orthodoxy, philosophy of law

Ramona Nadaf, Ph.D. Boston University. Ancient Greek philosophy and literature, politics and the novel, 20th-century French thought, history of philosophy

Affiliated Faculty

Hubert Dreyfus, Ph.D. Harvard University. Continental philosophy, cognitive science, technology, philosophy of technology

Michael J. Gorman, Ph.D. University of London. European intellectual history, Marxist theory, visual discourse and culture

Anthony Long (Irving Stone Professor of Literature). Ph.D. University of London, American literature

Hans Sluga, B.Phil. Oxford University. Twentieth-century European philosophy, analytic and continental Wittgenstein, Foucault political philosophy

Lecturers

Felipe Gutierrez, J.D., Ph.D. University of California, Berkeley. Contemporary rhetorical theory, social theory, legal rhetoric

Major Adviser: Ms. Nadaff.
Graduate Adviser: Ms. Kohn.

Department Overview

Rhetoric majors are trained in the history of rhetorical theory and practice, grounded in argumentation and in the analysis of the symbolic and institutional dimensions of discourse. This department offers both a pragmatic understanding of the elements of rhetorical analysis—with special attention to logical style, tropes, figures, images—and a thorough grounding in the historical development of these elements in rhetorical theory. The combination allows students to take a disciplined grasp of the contemporary character of rhetoric and language. This emphasis on rhetoric's historical and theoretical past is central to this major. This department offers an understanding of the form 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: A) history and theory of rhetoric, B) public discourse, and C) narrative and image. Majors must complete the following course requirements: 1) all courses in the lower division, 2) Rhetoric 103A and 103B in the upper division plus five additional upper division courses in Rhetoric—three in the specified area of concentration and two others outside that area. Additional courses are required to take one course outside the department related to the specified area of concentration in the major.

Students must complete Rhetoric 10 and 20 with letters A or B in order to be considered for the major. These courses are prerequisite to all upper division courses unless otherwise specified. Lower division requirements should be completed by the start of the junior year; senior year is recommended for coursework in the specified area of concentration. However, concurrent enrollment in 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 to finish the major program successfully. No course taken for a Passed/Not Passed grade will be allowed toward credit for the major.

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
A. 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 rhetorical influence and production, both in history and in practice, in specific contexts throughout its history. Courses in this area include 105, 110, 110M, 132, 137, 138, 140, 174, 175, 177, 181, 196.

B. Public Discourse. This area focuses upon understanding rhetoric as a symbol and institutional dimensions, with special emphasis on legal and political forums. Students consider the discourse of law, politics, and society both in theory and in 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 131, 141AC, 150, 152, 152AC, 153, 155, 157A-157B, 158, 159A-159B, 168, 169AC, 164, 165, 166, 167, 168, 170, 171, 172, 179, 196.*

C. Narrative and the Image. This area focuses upon understanding the function of rhetoric in literary, cinematic, and visual texts, with emphasis on the role of figure and image in the representation of reality. Students consider the production and reception of narrative “literature”—oral, epic, folktale, lyric poem, novel, etc.—and film, in an attempt to understand the boundaries of the aesthetic text as a rhetorical construction. Analyzing particular literary and visual genres arising in a variety of cultures and historical epochs. Courses in this area include 119, 121A-121B, 122, 123, 124, 125, 126, 127, 128, 129, 133, 134, 135, 139, 139AC, 156, 176, 178, 180AC, 196.*

If course topic is appropriate
Declaring the Major. Declare rhetoric after completing Rhetoric 10 and 20, with letter grades of C or better. Obtain a Petition to Declare the Major and the rhetoric major application from the undergraduate assistant in 7404 Dwinelle Hall. The petition also is available from the College of Letters and Science, 113 Campbell Hall. Present a copy of your transcript along with your petition and application to the undergraduate assistant for an approval signature and a brief orientation.

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.

Honor 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 the two-semester honors thesis sequence. Students will be selected by the supervision of a selected rhetoric faculty member. Four units of credit (2 units each semester) for the H190A-H190B sequence may be applied toward graduation as upper division units and fulfill a broad upper division elective. Honors candidates who complete the 4-unit course with a letter-grade of A or better and maintain the required GPAs will receive a BA with honors in the major.

Seniors eligible to enroll in the honors program must begin the program with the faculty mentor who is assigned to direct their honors thesis in the semester they enroll in H190A. See the undergraduate assistant for honors information and an application. Warning: Graduating honors candidates must complete major requirements by taking an incomplete in the H190A-H190B series must drop themselves from the degree list or honors will not appear on their official transcripts or diplomas.

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 the interaction of the speaker and the public, and poses such questions as: how is philosophy (or law, or politics, etc.) constituted as a field? What kinds of discourses are considered legitimate within this field? And what kinds of argument are introduced and institutionalized as a result? To this end, minors are required to take Rhetoric 10, 20, 103A, and 103B. This combination provides an overview of philosophical, literary and cultural discourse; theoretical inquiry into law, politics, and society; rhetoric and theory of film, as well as experience in a diachronic overview of the evolution of these fields. Three further elective courses from numbers between 105-179 and 196 are left to the discretion of the minor student.

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 and theoretical concerns of other disciplines. Rhetoric also offers a special track for graduate students interested in pursuing a Ph.D. in the area of film theory. The department's approach to the study of rhetorical theory is an interpretive approach to the interpretation of the arguments of such fields as law, politics, literature, film, and philosophy. The interests of faculty and graduate students range from 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 qualifying examinations and dissertation research. 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 research, 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
Note: Check with department for exact course offerings during the year.

R1A. The Craft of Writing. (4) Three hours of lecture per week. Prerequisites: Subject A or examination. Formerly 1A. Rhetorical approach to reading and writing argumentative discourse. 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,SP) Staff

R1B. The Craft of Writing. (4) Three hours of lecture per week. Prerequisites: 1A or equivalent. Formerly 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 of lecture per week. An introduction to practical reasoning and the critical analysis of argument. Topics treated will include: definitions, the logical fallacies, enthymemes, fallacies, as well as various non-logical appeals. Also, the course will treat in introductory fashion some ancient and modern attempts to relate rhetoric and logic. (F,SP) Staff

20. Rhetorical Interpretation. (4) Three hours of lecture and one hour of discussion per week. Introduction 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, to visual and material culture generally. (F,SP) Staff

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. 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 Berkeley 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. Berkeley Seminars are offered in all campus departments, and topics vary from semester to department to department to semester. Staff

30. Rhetorical Theory and Oral Argument. (4) Three hours of lecture/discussion per week. Prerequisites: 10 or permission 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. Sections 1-3 to be graded on a letter-grade basis. Sections 4-6 to be graded on a passed/not passed basis. Prerequisites: Prior to freshmen and sophomores. These seminars oriented to all campus departments; topics vary from department to department and from semester to semester. Staff

40AC. Rhetoric of Film in American Cultures. (4) Course may be repeated for credit. Three hours of lecture plus film screening per week. Prerequisites: 1A-1B or equivalent. Study of the rhetoric of film in American culture, with emphasis on topics such as the ideology of race and gender, miscegenation, “passing,” and other cultural fantasies and anxieties. This course satisfies the American cultures requirement. (SP) 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, Asian American, Latino, and European American oral and written traditions, 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 revolutionize 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. Three hours of work per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of adviser. Instruction for a small group of students on a topic initiated by those students. (F,SP) Staff

Upper Division Courses

Note: Because there have been changes to major and minor requirements, please 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 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 II. (4) Three hours of lecture per week. Prerequisites: 10 or consent of instructor. Formerly 100B; a broad consideration of the historical relationship between philosophy, literature, and rhetoric with special emphasis on selected themes within the early modern and modern periods. (SP) Staff

105. Rhetorical Theory and Practice in Historical Eras. (4) Course may be repeated for credit with different instructor. Three hours of lecture per week. Ex-
amination of how rhetorical principles and patterns operate in an author’s or speaker’s presentation of self in relation to the character of an intended audience. Staff

110. Advanced Argumentative Writing. (4) This course is equivalent to 110M. Three hours of lecture per week plus individual conferences. 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

110M. Advanced Argumentative Writing. This course is equivalent to 110. Three hours of lecture per week plus individual conferences. Prerequisites: Any 1A-1B sequence or upper division standing. Majors only. 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

119. Genre in Film and Literature. (4) Course may be repeated for credit. Three hours per week plus film screenings. Prerequisites: Consent of instructor. Study of a particular genre (e.g., detective/mystery, horror, melodrama) with attention to theories of genre in popular culture. Staff

121A-121B. Rhetoric of Fiction. (4,4) Three hours of lecture per week. Prerequisites: A is prerequisite to B. A. Form: Definition and techniques of narrative, including voice, point of view, time orders, and related matters. B. Content and Context: Interpretation of authorial intentionality in selected works of modern fiction, in terms of their cultural and historical contexts. Staff

122. Rhetoric of Drama. (4) Three hours of lecture per week. Examination of the way character is created in drama by repetitive rhetorical patterns and the ways themes are defined by manipulation of such patterns. (SP) Staff

123. Poetry and Performance. (4) Three hours of lecture per week. Prerequisites: 10 or consent of instructor. The class studies poetry from diverse cultures as performance art. It examines the creative processes of poetry through oral interpretive techniques. Students will engage in ethnographic explorations into the "field" of poetry in the large community of poets who perform poetry in readings around the Bay Area. (F,SP) Staff

124. Rhetoric of Poetry. (4) Three hours of lecture per week. Prerequisites: 10. Consideration of the relationship between poetic text and oral/aural performance of the work. Performance and interpretation of various poets. (F,SP) Staff

125. Poetics and Poetry. (4) Three hours of lecture per week. Prerequisites: Upper division standing. Studies in the relationships between poetic theory and poetic practice from Aristotle’s Poetics to the present day. Staff

126. Rhetoric of the Realist Novel. (4) Three hours of lecture per week. Prerequisites: Upper division standing. Rhetorical analysis of the realist novel in the context of intellectual and social history. The course will explore the development of literary realism in relation to the social problems of industrialization and urbanization in nineteenth-century Europe. Staff

127. Novel and Society. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. The adaptation of written fiction to the cinema. Focus on the problems arising from the transformation of five novels, which will be read, into their filmed versions. (F,SP) Staff

131. Rhetoric of Religious Discourse. (4) Three hours of lecture per week. Consideration of the rhetoric of hermeneutics or biblical interpretation with special emphasis on the mythical, symbolic, and allegorical language as the bearer of persuasive intention. Also listed as Religious Studies C111. Staff

132. Rhetoric, Culture and Society. (4) Three hours of lecture per week. Prerequisites: 103A; Upper division standing. Analysis of rhetorical practice in the context of society and culture. Reference to the historical transition from pre-industrial to industrial society in the west. (F,SP) Staff

133. 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. A seminar not covered by the other film categories. This course might focus on the work of a single filmmaker, a particular cinematic "theme," or a nonhistorical and nongenre category. Examples: Feminist Film Practice, Gay and Lesbian Cinema, Race and Cinematic Representation, Alfred Hitchcock. Staff

134. National Cinema. (4) Course may be repeated for credit as topic varies. Three hours of class per week plus film viewings. Prerequisites: Upper division standing. An introduction to a major national cinema, and to the relationship between cinema and national identity. Examples: Italian Cinema after Neorealism, German Cinema, post-war American Cinema, and French Cinema. Staff

135. Rhetoric of Narrative Genres in Nonliterary Societies. (4) Course may be repeated for credit with different instructor. Three hours of lecture per week. Investigation of the rhetorical and cultural principles common to various genres of narrative, both prose and poetic, in nonliterary societies. Mythic, epic and folk narratives considered as well as written works from cultures in transition. Staff

136. Rhetorical Approaches of Folklore. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture, performance, persuasion and play in rhetorical perspective. The course will explore performance genres on the margins of orality/literacy in diverse cultures, including particularly contemporary fab folks, medieval European vernacular traditions, and contemporary American popular cultures. Staff

139. Rhetoric of Autobiography. (4) Three hours of lecture per week. Prerequisites: Upper division standing. Rhetorical analysis of autobiographical discourse, with special attention to the evolution of the genre in relation to changing modes of human subjectivity. Staff

139AC. Autobiography and American Individualism. (4) Three hours of lecture per week. Prerequisites: Upper division standing. Rhetorical analysis of autobiographical discourse in American cultures, with special attention to the ideology of individualism. This course satisfies the American cultures requirement. (F,SP) Staff

140. The Discourse of Qualities. (4) Three hours of lecture/discussion per week. Prerequisites: Any 1A-1B sequence or upper division standing. Study of the discourse of qualities, with focus on how we speak about the "howness" of things as opposed to the "whatness" of things. Topics to include questions of taste, aesthetic judgment, expression, and representation. Staff

141AC. American Cultures as a Problem of Postmodernity. (4) Three hours of lecture per week. Drawing on fiction and philosophy, this course explores the nature of political, ethical, and aesthetic judgment in the absence of an agreed-upon decision-making procedure, testing the relevance of postmodern theory to American cultures. This course satisfies the American cultures requirement. (F,SP) Staff

150. Rhetoric of Contemporary Politics. (4) Three hours of lecture per week. Examination of the character of rhetorical activity in modern and contemporary politics. Emphasis on building a theoretical foundation for critically observing and participating in the contemporary political process. Staff

152. Rhetoric of Constitutional Discourse. (4) Three hours of lecture per week. The rhetorical context of The Federalist. Examines the tradition of Anglo-American constitutional argumentation in the eighteenth 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) Three hours of lecture per week. Staff

153. American Political Rhetoric. (4) Three hours of lecture per week. Staff

155. Rhetoric of the Political Novel. (4) Three hours of lecture per week. Staff

156. Rhetoric of the Political Novel. (4) Three hours of lecture per week. Staff

157A. Rhetoric of Modern Political Theory. (4) Three hours of lecture per week. Formerly 157. Study of actual strategies of modern political and legal theory. Staff

158. Advanced Problems in the Rhetoric of Political Theory. (4) Three hours of lecture per week. Close study of selected 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 two or three theorists or an important theme or issue, with close readings of major texts as well as attention to important commentators. Staff

160. Introduction to the Rhetoric of Legal Discourse. (4) Three hours of lecture per week. 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 and 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

163AC. Law, Ethnicity, and the Rhetoric of National Security. (4) Three hours of lecture per week. This course examines the way in which the category of "national Security" has emerged in political and legal discourse as an interest which is balanced against, and usually overrides, the rights of individual citizens. The course will pay particular attention to the role which ethnicity and "otherness" have played in this development. The course will cover topics such as the eu- geneic movement and its impact on immigration policies and legalized sterilization, the internment of Japanese-Americans and other groups during World War II, and the role of racial ideologies in national and international politics in World War II and the post-war
Scandinavian
(College of Letters and Science)

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 materials are also offered. Lower and upper division lecture courses, all based on reading in English and open to those without a knowledge of Nordic languages, cover a wide variety of topics. The undergraduate major involves a program integrating the study of Danish, Norwegian, or Swedish language with emphasis upon the literature in the major language. The Ph.D. in Scandinavian. 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. Students will present a major and a minor field, the major field to be studied comprehensively. Students presenting a Scandinavian literature as a major field, for example, must work in three periods: Middle Ages, Reformaion to Romanticism, and Realism to the present. 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.

Graduate Program
Aims of the Program. The graduate program in Scandinavian is designed for future scholars and teachers in the field of Scandinavian languages and literatures. The program leads to the Master of Arts and Doctor of Philosophy in Scandinavian. The department welcomes proposals for alternative or intersubdepartmental programs from students with special interests in areas such as art, film, folklore, history, and linguistics. Interested students should submit detailed proposals for such programs with their application for admission.

Preparation. The A.B. in Scandinavian, or its equivalent, is ordinarily prerequisite to admission. Preparation should include a comprehensive knowledge of one Scandinavian language and good reading ability in at least one other, as well as knowledge of the broad outlines of Scandinavian culture and history. Without preparation, a student may be admitted under the stipulation that deficiencies be corrected.

Master of Arts. 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. Students will present a major and a minor field, the major field to be studied comprehensively. Students presenting a Scandinavian literature as a major field, for example, must work in three periods: Middle Ages, Reformaion to Romanticism, and Realism to the present. 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.

Courses from other departments may be accepted with the consent of the graduate adviser.

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,SP)

1B. Intermediate Swedish. (4) Three hours of language instruction and one hour of laboratory per week. Prerequisites: 1A or consent of instructor. Students will develop the basic elements of communicative competence in both the spoken and written language within a cultural context. (F,SP)

2A. Beginning Finnish. (4) Three hours of language instruction and one hour of computer laboratory per week. Prerequisites: 1A 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,ST)

2B. Intermediate Finnish. (4) Three hours of language instruction and one hour of laboratory per week. Prerequisites: 2A 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,ST)

3A. Beginning Norwegian. (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,SP)

3B. Intermediate Norwegian. (4) Three hours of language instruction and one hour of laboratory per week. Prerequisites: 3A 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,ST)

4A. Beginning Danish. (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,SP)

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. (SP,ST)

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,SP)

1B. Intermediate Swedish. (4) Three hours of language instruction and one hour of laboratory per week. Prerequisites: 1A or consent of instructor. Students will develop the basic elements of communicative competence in both the spoken and written language within a cultural context. (F,SP)

2A. Beginning Finnish. (4) Three hours of language instruction and one hour of computer laboratory per week. Prerequisites: 1A 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,ST)

2B. Intermediate Finnish. (4) Three hours of language instruction and one hour of laboratory per week. Prerequisites: 2A 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,ST)

3A. Beginning Norwegian. (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,SP)

3B. Intermediate Norwegian. (4) Three hours of language instruction and one hour of laboratory per week. Prerequisites: 3A 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,ST)

4A. Beginning Danish. (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,SP)

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. (SP,ST)

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: 4A or 4B (or consent of instructor). In the context of inter-Scandinavian communica-
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 comparative component, students will acquire the oral competence necessary to function in authentic situations of language use with respect to grammatical, functional, and sociolinguistic skills in their own target language (Danish, Norwegian, or Swedish) and non-Scandinavian languages. Course normally focuses on one of two areas: Eddic and skaldic poetry; or sagas (royal family, legendary, courtly, episodal). (SP) Clover, Lindow

127. Scandinavia 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. Møller-Irving

128. Scandinavia from 1800-the Present. (4) Three hours of lecture 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 language and literature; history of the Napoleonic Era to the present. (SP) Møller-Irving

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) Sanders

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) Staff

156. Scandinavian Folklore. (4) Three hours of lecture per week. Scandinavian folklore, emphasizing oral narrative traditions (legends and folk belief, folktales, ballads) and their contexts. Such minor verbal forms as proverbs, riddles, and formulas will also be considered. Readings and discussion in English. (F,SP) Lindow

160. Seminar in Viking and Medieval Scandinavia. (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. (F) Clover, Lindow

165. Scandinavian Folklore. (4) Three hours of lecture per week. Scandinavian folklore, emphasizing oral narrative traditions (legends and folk belief, folktales, ballads) and their contexts. Such minor verbal forms as proverbs, riddles, and formulas will also be considered. Readings and discussion in English. (F,SP) Sanders

170. Arctic Folklore and Mythology in Nordic Lands. (4) Three hours of lecture per week. Survey of the folklore and mythology of the principal non-Scandinavian peoples of the Nordic lands: Finns, Saami, Greenland. Readings and discussion in English. (SP) Lindow

180. Special Topics in Scandinavian. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Knowledge of a Scandinavian language. Additional readings and interpretation of Scandinavian texts. (F,SP) Lindow

198. Group Study for Advanced Undergraduates. (2-4) Course may be repeated for credit. Directed study. Must be taken on a pass/failed basis. Prerequisites: Two years study of one Scandinavian language. Advanced readings and interpretation of Scandinavian texts. (F,SP) Lindow

199. Independent Study and Research. (2-4) Course may be repeated for credit. Directed study. Must be taken on a pass/failed basis. Prerequisites: Two years study of one Scandinavian language. Courses in Scandinavian literature, culture, or history. Supervised study; restricted enrollment. (F,SP) Lindow

200. Introduction to Graduate Study in Scandinavian. (4) Three hours of sessions per week. A problem-oriented course concerned with major areas of graduate study in Scandinavian: linguistics and philology, folklore, history, literary criticism. (F) Staff

201A. Old Norse. (4) Three hours of lecture per week. An introduction to the language of medieval Iceland and Norway. Grammar, historical phonology, and texts. (F) Clover, Lindow

201B. Norse Literature. (4) Three hours of lecture per week. Prerequisites: 201A or equivalent. Literacy production of early Iceland and Norway. Reading of representative texts in the original. (SP) Clover, Lindow


206. Studies in Philology and Linguistics. (4) Course may be repeated for credit. Three hours of lecture per week. Variable subject matter; see departmental announcement for description. Sample topics: runology; history of the Scandinavian languages; diachology. (F,SP) Lindow

220. Early Scandinavian Literature. (4) Three hours of lecture per week. Prerequisites: 201A or equivalent. Variable subject matter; see departmental announcement for description. Sample topics: runology; history of the Viking Age to the Reformation; emphasis is on extraliterary sources. (F,SP) Clover, Lindow

221. Early Scandinavian History and Culture. (4) Course may be repeated for credit. Three hours of lecture per week. Historical topics from the Viking Age to the Reformation; emphasis is on extraliterary sources. (F,SP) Clover, Lindow

230. Reformation Through the 18th Century. (4) Three hours of lecture/discussion per week. Reading and analysis of representative works. Topics vary from semester to semester; see departmental announcement for description. (F) Staff

235. Studies in Romanticism and Realism. (4) Course may be repeated for credit. Three hours of lecture/discussion per week. Reading and analysis of representative works. Topics vary from semester to semester; see departmental announcement for description. (F) Staff

240. Modern and Contemporary Scandinavian Literature. (4) Course may be repeated for credit. Three hours of lecture/discussion per week. Reading and analysis of representative works. Topics vary from semester to semester; see departmental announcement for description. (F) Staff

249. Graduate Studies. (1) Course may be repeated for credit. One hour of discussion per week. Prerequisites: Graduate standing in Scandinavian. Additional work in connection with one of the following courses: Scandinavian language and literature; history of 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 departmental 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 available seminars. (F,SP)

299. Dissertation Writing. (2-12) Course may be repeated for credit. Supervised study. Must be taken on a satisfactory/unsatisfactory basis. (F,SP)

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)

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 examinations required of candidates for the Ph.D. May not be used to meet unit or residence requirements for the doctoral degree. (F,SP)
Science and Mathematics Education
(Con[ College of Letters and Science)

Group Office: 4553 Tolman Hall, (510) 642-4207
Faculty
Alice M. Agogino, Ph.D. Stanford University. Artificial intelligence, robotics, automated systems, design theory and methods, engineering education, qualitative reasoning policies, micro-implementation, fiscal stress management, technology and education (Chancellor’s Professor)

Martin V. Covington, Ph.D. University of California, Berkeley. Classroom management, student motivation and creative thinking (Psychology)

Bernard R. Gifford, Ph.D. University of Rochester. Organizational theory, policy analysis, resource allocation policies, micro-implementation, fiscal stress management, technology and education (Chancellor’s Professor)

Roger P. Hall, Ph.D. University of California, Irvine. Mathematics education research; critical evaluation of the literature; design and implementation of instructional computing systems. (SP)

Michael Ranney, Ph.D. University of Pittsburgh. Problem solving, knowledge representation and reorganization, computational models of cognition, naive physics, intelligent tutoring systems (Education)

Marcia G. 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, cognitive and philosophical perspectives (Emeritus)

Joseph N. Goodnow, Ph.D. University of California, Berkeley. Psychology of mathematics education, metacognition, belief systems (Education and Mathematics)

Johanna Nichols, Ph.D. University of California, Berkeley. Russian literature and film (Emeritus)

Rachel Strickland, Ph.D. University of California, Berkeley. Russian literature and culture (Emeritus)

Lecturers

Eric Naiman, Ph.D. University of California, Berkeley. Technical English (Emeritus)

Associate Professors

Arkady Alexeev, Ph.D. University of California, Berkeley. Russian literature and film (Emeritus)

Robert P. Hughes, Ph.D. (Emeritus)

Annemarie Kohn, Ph.D. (Emeritus)

Hugh McLean, Ph.D. (Emeritus)

Czeslaw Milosz, Mag. Jur., D. Litt. (Emeritus)

Professor

Lorna Alexander, Ph.D. Harvard University. South Slavic linguistics (Emeritus)

Czeslaw Milosz, Mag. Jur., D. Litt. (Emeritus)

David A. Frick, Ph.D. Yale University. Polish and pre-modern Slavic literatures

Olgica Matich, Ph.D. University of California at Los Angeles. Russian literature and cultural history

Inna Paperno, Ph.D. Stanford University. Russian literature and historical linguistics

Inna Paperno, Ph.D. Stanford University. Russian literature and cultural history

Alan H. Schoenfeld, Ph.D. Stanford University. Psychology of mathematical problem solving, metacognition, belief systems (Education and Mathematics)

Angela Stacy, Ph.D. Cornell University. Inorganic and physical chemistry (Chemistry)

Barbara Y. White, Ph.D. Massachusetts Institute of Technology. Textbook models of scientific and mathematical expertise, computer-based learning environments, metacognition, instructional design (Education and Computer Science; Chair of SESAMÉ)

Affiliated Faculty

Michael Clancy, Ph.D. Stanford University (Electrical Engineering and Computer Sciences)

Herbert D. Thier, Ed.D. New York University (Lawrence Hall of Science)

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, computer science/engineering, or mathematics; to focus on areas of interest 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 departmental Ph.D. candidate in that discipline. Their thesis research will consist of a project dealing with the development of improved educational approaches research on new instructional models or basic research on learning or cognition in mathematics and science. Upon satisfactory completion of their studies in the Group in Science and Mathematics Education, students will obtain the degree of Ph.D. in science and mathematics education.

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 computer science. Experience teaching, developing instructional materials, or doing educational 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 and Development. (1-4) Course may be repeated for credit. One unit of credit for each four hours of student effort 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 discussion of readings and interaction with guest speakers. (F,SP)

211. Cross-Cultural Cognition and Learning. (3) Three hours of lecture per week. This course will examine cognition and learning as culturally and contextually situated activities from a variety of research perspectives. Topics cover an overview of theoretical issues and forms of knowledge representation including mental models, schema, and numerical systems. Emphasis will be placed on exploring how context is incorporated into research design. Course concludes with review of the impact of cognitive studies on educational practice. (F)

212. Cognition and Learning in Social Context. (3) Three hours of seminar per week. Though thinking and learning often occur in social situations, research on cognition tends to focus on the intra-individual level. This course explores the social dimension of cognition in the context of everyday classroom teaching and peer teaching, and teacher-led small group instruction. Classwork includes discussion of published research and analysis of videotapes from the focal contexts. The course concludes with a critical overview of educational programs that use group approaches to learning. (F)

220A. Introduction to the Psychological Bases for Science and Mathematics Education. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. An overview of psychological theory pertinent to research and development in science and mathematics education. The course will include topics from development, cognitive, social, and differential psychology.

220B. Research Design in Science and Mathematics Education. (3) Three hours of lecture/discussion per week. Prerequisites: 220A or consent of the instructor. Survey of experimental, quasi-experimental, and ethnographic methods in science and mathematics education research; critical evaluation of published research papers; and development of a proposal for research project. Emphasis on process of formulating, criticizing, and refining research plans.

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 computer-based instruction. Includes consideration of evaluation methods and development of instruction modules for topics in science and mathematics. (SP)

230. Human-Computer Communication. (3) Course may be repeated for credit. Two hours of lecture and three hours of laboratory per week. Prerequisites: One course in programming. Design and implementation of human-computer communication systems. Software, hardware, and cognitive aspects of communication. Help systems, windowing, menus, command languages, and knowledge representation. Implications of the design of instructional computing systems. (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. Critical discussion of ongoing educational 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. Prerequisites: Consent of instructor. Independent research activities under supervision of a 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)

602. Individual Study for Qualifying Examination. (1-12) 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. In-dweller study, under the supervision of a faculty member, designed to prepare the student for Ph.D. qualifying examination. (F,SP)

Slavic Languages and Literatures
(Con[ College of Letters and Science)

Department Office: 6030 Dwinelle Hall, (510) 642-2979 http://www.lit.berkeley.edu/dept/slavic/index.html

Professors

Ronelle Alexander, Ph.D. Harvard University. South Slavic linguistics, literature (Emeritus)

Arkady Alexeev, Ph.D. University of California, Berkeley. Russian literature and film (Emeritus)

Lecturers

Inna Paperno, Ph.D. Stanford University. Russian literature and historical linguistics

Inna Paperno, Ph.D. Stanford University. Russian literature and cultural history

Alan Tsimberlake, Ph.D. Harvard University. Slavic linguistics

Inna Paperno, Ph.D. Stanford University. Russian language

Inna Paperno, Ph.D. Stanford University. Russian literature and cultural history

Irina Paperno, Ph.D. Stanford University. Russian literature and cultural history

Olgica Matich, Ph.D. University of California at Los Angeles. Russian literature and cultural history

Antonina Petukhova, Ph.D. University of California at Los Angeles. Russian linguistics

David A. Frick, Ph.D. Yale University. Polish and pre-modern Slavic literatures

Academic Resources

Danil Dmitriev, Ph.D. University of California, Berkeley. Russian literature

Robert P. Hughes, Ph.D. (Emeritus)

Robert P. Hughes, Ph.D. (Emeritus)

Annemarie Kohn, Ph.D. (Emeritus)

Czeslaw Milosz, Mag. Jur., D. Litt. (Emeritus)

Walter Schamshuch, Ph.D. (Emeritus)

Associate Professors

Liza Knapp, Ph.D. Columbia University. Russian literature

Elinor Naiman, Ph.D. University of California, Berkeley. Russian literature and culture

Anne Nebset, Ph.D. University of California, Berkeley. Russian literature and culture

Harsha Ram, Ph.D. Yale University. Russian literature

Lecturers

Inna Paperno, Ph.D. University of California, Berkeley. Russian language, Slavic linguistics

Liza Little, M.A. University of Texas at Austin. Russian language, language teaching methodology

Agnes Milikaitis, Diplomas, Debrecen, Hungary. Hungarian language

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
\*Prefix=language course for business majors
\*Prefix=course satisfies R& requirement
AC suffix=cross-listed course
AC suffix=satisfies American cultures requirement
B prefix=course satisfies R& requirement
C prefix=course satisfies R& requirement
H prefix=honors course


414 / Slavic Languages and Literatures

Major Adviser: Mr. Timberlake.
Graduate Advisers: Mr. Naiman (Literature), Ms. Alexander (Linguistics).

Department Overview

The Department of Slavic Languages and Literatures offers an integrated study of the languages, cultures, and literatures of the peoples, not only of Russian but also of Bulgarian, Czech, Serbian/Croatian, Polish, and Hungarian. Most literature courses are taught in translation and require no knowledge of any foreign language. Course descriptions with reading lists and prerequisites are posted outside the department office.

Majors: The department offers two majors. The major in Russian/East European/Eurasian Cultures invites students to articulate a broad interdisciplinary program by taking courses in the department and related courses in other departments or programs. The major can be focused on any of the peoples of the region. For this major, two years of study (or the equivalent) in Russian or another language are required. The major in Slavic Languages and Literatures focuses specifically on literature and language, usually Russian. It requires three years of language course work (or the equivalent).

Minors: The department offers a range of minors in Russian language and literature and other Slavic languages. Students normally discuss the possibility of doing a minor with the faculty or staff major adviser well before graduation. Students must complete a Confirmation of Minor petition with the major adviser by their last semester.

Major in Russian/East European/Eurasian Cultures (50-52 units)

This major 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, and Music. While all majors will be exposed to the knowledge of the whole area, the program allows each student to either focus on one specific cultural region or to combine different regions in their studies (e.g., Russian culture; the cultures of Russia and the Caucasus; Balkan cultures; Central European cultures). Students are advised to see the major adviser in advance to prepare an individualized study plan for their major emphasis. Students are encouraged to declare the major after the successful completion of two semesters of their designated elementary language emphasis.

Requirements

Lower division (22-24 units): (1) Four semesters of one language of the area (19 to 20 units) or the equivalent, as determined by examination. The department highly recommends additional exposure to language, in course work, intensive summer language programs, or the Education Abroad Program.

Languages offered by this department that can be used for the major are Russian, Polish, Czech, Serbian/Croatian, Bulgarian, and Hungarian. The following courses have been offered periodically by the Department of Near Eastern Studies or the Department of Linguistics: Georgian, Armenian, Kazakh, Ingush, and Chechen.

(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 37, 39, 45, 46.

Upper division (28 units): (1) One cultural topics course: Slavic 148, Topics in Russian Cultural History, or Slavic 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; 173; 177.

(3) Five courses chosen from any upper division offerings of the Slavic Department, or in combination with the following department offerings, e.g., Geography 54; Political Science 129B, 129C, 141A, 141C; Sociology 181. With permission of the major adviser, students may substitute relevant courses from the following departments: Anthropology, Art History, Comparative Literature, Dramatic Art, Economics, Journalism, Legal Studies, Peace and Conflict Studies. Of these courses, a minimum of one and a maximum of three courses can be taken in departments other than Slavic.

Up to two upper division language courses in the Slavic Department, taken in addition to the initial adviser, students may substitute relevant courses from the following departments: Anthropology, Art History, Comparative Literature, Dramatic Art, Economics, Journalism, Legal Studies, Peace and Conflict Studies. Of these courses, a minimum of one and a maximum of three courses can be taken in departments other than Slavic.

Major Program in Russian Language and Literature (53-56 units)

This core major integrates the study of the Russian language, literature, and culture.

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 Slavic 1, 2, 3, 4 or the equivalent.

(2) Nineteenth- and twentieth-century surveys of Russian literature (Slavic 45 and 46).

Upper division (27-30 units): (1) Advanced Russian language (Slavic 103A, 103B) and Russian 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, N, or 146).

(4) One course in culture selected from the following: Russian culture (Slavic 130, 131, 140, 146, 148, 190); the literatures of other Slavic major languages (Slavic 150, 160, 170); folkloric literature (Slavic 147); linguistics (Slavic 137); film literature (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 disciplines—for example, history—may be substituted with the permission of the major adviser.

Major Programs in Other Slavic Languages (53-56 units)

With advance consultation, students can arrange a broad interdisciplinary program of study in Russian but also of Bulgarian, Czech, Serbian/Croatian, and Hungarian. Students are advised to see the major adviser well before graduation. Students must complete a Confirmation of Minor petition with the major adviser by their last semester.

Requirements

In addition to Slavic 1 and 2 (10 units) and two lower division courses in literature and culture chosen from 36, 37, 39, 45, and 46 (6 units), the requirements include:

(1) 10 units of the relevant elementary language [Slavic 25A-25B (Polish), 26A-26B (Czech), 27A-27B (Serbian/Croatian)].

(2) 8 units of intermediate language [Slavic 115A-115B, 116A-116B, or 117A-117B].

(3) 3 units of the survey course in the relevant literature (Slavic 150, 160, or 170).

(4) 7 units of two additional courses in the relevant literature in the original (Slavic 151-152, 161-162, or 171-172).

(5) A plan of study, designed in advance in consultation with the major adviser, consisting of three relevant courses (8-12 units) in Russian or European literature and history.

Total lower division units: 26
Total upper division units: 27-30

The 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 will write a thesis under the direction of a member of the faculty (thesis director). In order to enroll in H195, students must file an application with the department (available in the department office). This application includes a preliminary statement of the thesis topic and the names of the members of the honors committee, consisting of a faculty director and one additional faculty member, who also reads the completed thesis.

Minor Programs

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 other than Russian.

Requirements: The basic course requirement for each of the minors is five upper division courses, all completed for a letter grade, and three of which must be completed at Berkeley. The minor is in a field academically distinct from the student’s major. An overall grade-point average of 2.0 in upper division courses applied to the minor program is required. The minor can be declared the semester after all courses are completed for the minor or up to two weeks past the date of graduation. A Confirmation of Minor form (available from the department office) must be completed with the major adviser (who must be able to review and keep a copy of the student’s unofficial transcript).

Note: The language minors are not open to native speakers of the languages.

Minor in Russian Language, Literature and Culture. Prerequisites: Four semesters of elementary and intermediate Russian (Slavic 1-4 or equivalent).

Five upper division courses (3 or 4 units each) in Russian language and/or Russian and other Slavic literatures and cultures. Students may choose courses in any combination, in consultation with the major adviser. A course from another related program (for example, comparative literature) may be substituted with approval of the major adviser.

Total upper division units: 15-16

Minor in Russian Language. Prerequisites: Four semesters of elementary/intermediate Russian (Slavic 1-4 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).

The majors and minors in Slavic Languages and Literatures are open to native speakers of the languages.
Admission to Graduate Study

Candidates for higher degrees must have completed an undergraduate major program in Slavic languages and literatures or received equivalent training. Prospective and current students are encouraged to acquire a background in other related fields: European languages and literatures (especially French, German, Italian and English), literary theory, Russian and Western European intellectual history. Students and candidates in literary studies; for those in linguistics, preparation in French, German, Greek or Latin, and/or in general and comparative linguistics is desirable.

New students admitted to the Ph.D. program with an M.A. in Slavic or a related field from another institution to pass a screening (permission-to-proceed) examination. Continuing students who have earned the M.A. degree from this department may be recommended for admission to the Ph.D. program following successful performance on the M.A. comprehensive examinations and demonstrated aptitude for advanced work.

Graduate Programs

M.A. and Ph.D. programs are offered in Russian, Polish, Czech, Bulgarian, and Serbian/Croatian, each with an emphasis in literature or linguistics.

Detailed descriptions of requirements are available from the department. 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. Course Work. Russian Literature Program: (a) Required skills and methods courses: Proseminar in literary scholarship (Slavic 25A-25B, 26A-26B, or 27A-27B) or equivalent. (b) Two advanced language courses (Slavic 115A-115B, 116A-116B, 117A-117B). (c) Literary survey (Slavic 150, 160, or 170). (d) A dissertation. (e) A language-teaching methodology course. (f) A dissertation. Linguistics Program: (a) Required skills and methods courses: Historical Grammar of Slavic Languages, Medieval Orthodox Slavic Texts, and/or a second Slavic language. (b) Additional courses: Historical Grammar of Slavic Languages, Medieval Orthodox Slavic Texts, and, in the major language, stylistics, and (c) One or more genre literature course. All candidates for the M.A. must demonstrate advanced proficiency in their major language, pass the departmental reading examination, and pass two written and one oral comprehensive M.A. examination. They must pass a reading examination of French or German or take two semesters of instruction in a second Slavic language.

Ph.D. Requirements. Literature: The Ph.D. program in Russian literature consists of (a) additional course work in literary history (including the Medieval and Early Modern periods) and theory; participation in research seminars and independent research. In addition, Ph.D. students develop knowledge of a second Slavic language and literature (Polish, Czech, Serbian/Croatian, Bulgarian) or another minor field (e.g., film, Russian or Eastern European history, Eurasian studies, etc.). (b) An extended written research project under faculty supervision and evaluation on a topic relative to the student’s major field of interest. (c) Written and oral Ph.D. examinations. (d) A dissertation.

Linguistics: The Ph.D. program in Slavic linguistics consists of (a) required course work in a set of core courses covering comparative Slavic linguistics, advanced structure of Slavic languages, history of Slavic literary languages, and two semesters of a third Slavic language. (b) Additional courses and seminars in two of three fields of specialization—grammatical analysis and theory, structural and cultural history of a major language, and comparative philology. (c) An extended written research project under faculty supervision and evaluation. (d) Written and oral Ph.D. examinations. (e) 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 Serbian/Croatian. Internships (Slavic 310) are available in the teaching of literature or Slavic linguistics.

Certificate in Russian and East European Studies

Slavic students who wish to enroll for the certificate must be in the Ph.D. program and have completed one year of study. Students who wish to begin work for the certificate earlier need the approval of their graduate adviser. See the index and the graduate assistant for additional information.

Student Organizations

The Slavic Student Association, in conjunction with the Berkeley Chapter of Dobro Slovo, the National Slavic Honor Society, sponsors special events and social activities for undergraduate students who are interested in the languages, culture, politics, and history of Slavic peoples.

Czech

Lower Division Courses

26A-26B. Introductory Czech. (5,5) Five hours of lecture per week. Prerequisites: 26A is prerequisite to 26B. Beginner’s course. Sequence beginning fall. (F,SP) Staff

Upper Division Courses

115A-115B. Advanced Czech. (4,4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 26B is prerequisite to 115A; 116A is prerequisite to 115B. Sequence begins fall semester. (F,SP) Staff

160. Survey of Czech Literature. (3) Three hours of lecture per week. Outline history of Czech literature from the tenth century to the present, including medieval literature of the fourteenth century, the National Revival of the nineteenth century, and the modern period. No knowledge of Czech required. Staff

161. Readings in Czech Literature. (4) Course may be repeated for credit with consent of instructor. Three hours of reading per week. Prerequisites: 116A. Selected readings in Czech, tailored to the academic interests of students enrolled. Staff

162. Topics in Czech Language and Literature. (3) Course may be repeated for credit with consent of instructor. Three hours of reading per week. Prerequisites: 116A may be taken concurrently. Studies in Czech literature or linguistics, or conversation, depending on the needs of the students enrolled. Staff

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; 115A is prerequisite to 115B. Sequence begins fall semester. (F,SP) Frick

150. Polish Literature and Intellectual Trends. (3) Three hours of lecture per week. 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 age of 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 reading per week. Prerequisites: 115A. Selected readings in Polish tailored to the academic interests of students enrolled. Frick

152. Topics in Polish Language and Literature. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 115A (may be taken concurrently). Studies in Polish literature or linguistics, or conversation, depending on the needs of the students enrolled. Frick

Russian Language

Lower Division Courses

1. Elementary Russian. (5) Five hours of lecture and two hours of language laboratory per week. Beginner’s course. (F,SP) Staff

2. Elementary Russian. (5) Five hours of lecture and two hours of language laboratory per week. Prerequisites: 1, 14A, or equivalent. (F,SP) Staff

3. Intermediate Russian. (5) Five hours of lecture and one hour of language laboratory per week. Prerequisites: 2, 14B, or equivalent. (F,SP) Staff
4. Intermediate Russian. (5) Five hours of lecture and one hour of language laboratory per week. (F,SP) Staff

14. Russian (Self-Paced). Self-paced course equivalent to Slavic 1 through 4. Students may enter or leave at any level. Any level may be repeated up to a total of five units, including the first year of this course, must meet the minimum study-list requirement. If units beyond those contracted for are completed, credit will be given. (F,SP) Staff

14A. Russian (Self-Paced). One to five hours of self-paced per week. Prerequisites: Graduate student standing or consent of instructor. (F,SP) Staff

14B. Russian (Self-Paced). One to five hours of self-paced per week. Prerequisites: 14A or equivalent. Graduate student standing or consent of instructor. (F,SP) Staff

14C. Russian (Self-Paced). One to five hours of self-paced per week. Prerequisites: 14B or equivalent. Graduate student standing or consent of instructor. (F,SP) Staff

14D. Russian (Self-Paced). One to five hours of self-paced per week. Prerequisites: 14C or equivalent. Graduate student standing or consent of instructor. (F,SP) Staff

Upper Division Courses

101. Advanced Russian Phonetics and Oral Performance. (1-3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 4, 14D, or equivalent. Aimed at undergraduates and graduate students, this course helps students to improve their pronunciation, bringing it closer to the native level. The course explores the spectrum of oral speech performance, including phonetics, intonation, and rhetoric, taking into account different functional styles. Course may be taken for 1 unit (5 weeks: basic skills), 2 units (10 weeks: advanced skills) or 3 units (15 weeks: advanced phonetics and performance). (F,SP) Staff

102. Readings in Specialized Russian. (3) Course may be repeated for a maximum of 6 units. Three hours of reading per week. Prerequisites: 4, 14D, or equivalent. Research project to be conducted in scholarly (scientific and technical), journalistic and business styles to familiarize the student with the peculiarities of vocabulary, grammar, and phraseology. (F,SP) Staff

103A-103B. Advanced Russian. (4) Four hours of lecture per week. Prerequisites: 4, 14D, or equivalent. Course covers three main aspects of advanced Russian: grammar, syntax, and reading. Grammar is reviewed. Course taught in Russian. (F,SP) Staff

104A. Word Formation and Word Order in Russian. (3) Three hours of lecture per week. Prerequisites: 103B or equivalent. Emphasis on word formation, syntax and word order in Russian. (F) Staff

104B. Advanced Russian Composition. (3) Three hours of lecture per week. Emphasis on writing, translation, and lexical analysis. (SP) Staff

105A-105B. Advanced Russian/English/Russian Translation. (4) Three hours of lecture per week. Prerequisites: 1, 2, 3, 4 or equivalent; or consent of instructor. Basic and 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 are also studied. (F,SP) Alexeev

109. Business Russian. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 103B or equivalent; consent of instructor. This course is designed for students with a good command of basic business Russian who would like to gain the vocabulary and business information to understand transactions in Russian to be able to establish actual contacts with Russian businesspeople, to participate in business negotiations, to compile business contracts in Russian, and to read Russian business newspapers and magazines. Elements of the business law of Russia will also be discussed. (F,SP) Alexeev

114. Advanced Self-Paced Russian for Native Speakers. (1-6) Course may be repeated for a maximum of 6 units. Individual conferences. Prerequisites: Oral proficiency; consent of instructor. Advanced self-paced course designed specifically for native speakers of Russian born in Russia or abroad who have never studied Russian grammar formally. Students master grammar at their own pace. (F,SP) Staff

120A-120B. Advanced Russian Conversation and Communication. (2-3) Course may be repeated for credit. Two to three hours of lecture per week. Prerequisites: 4 or equivalent. Formerly 120. Aimed at fostering advanced conversation and communication skills, this course explores Russian culture through conversation. Contains reading, films, vocabulary building, listening exercises, and speaking activities. The course can be taken for two or three credits; for two credits, attendance is required for two classes per week; for three credits, three classes per week. (F,SP) Staff

Russian Literature

Lower Division Courses

36. Great Writers of Russian Literature. (3) Three hours of lecture per week. Formerly 39. Readings in English of representative texts from the Russian literary tradition. (F,SP) Staff

45. Nineteenth-Century Russian Literature. (3) Three hours of lecture per week. Development of Russian literature from Pushkin to Chekhov. No knowledge of Russian required. Prerequisite is to also take a Slavic major and recommended for prospective graduate students. (F,SP) Staff

46. Twentieth-Century Russian Literature. (3) Three hours of lecture per week. Development of Russian literature from 1900 to the present: modernism, Soviet and emigre literature. No knowledge of Russian required. Prerequisite is admission to the Slavic major and recommended for prospective graduate students. (SP) Staff

Upper Division Courses

130. Medieval Russian Culture. (3) Three hours of lecture per week. Introduction to Eastern Orthodox culture of Old Russia, including literature, painting, and other visual arts. Staff

131. Literature, Art, and Society in 20th-Century Russia. (4) Three hours of lecture per week. A reading of novels by Russian and European literature. Extensive outside reading required for this course. (F,SP) Staff

132. Dostoevsky, Tolstoy, and the English Novel. (4) Three hours of lecture per week. A reading of novels by Dostoevsky and Tolstoy with some relevant English novels. We will look at how the Russian and English novels respond to each other, resemble each other and differ from each other, especially in their treatment of childhood, family, love, social theory, spirituality, and narrative. (F,SP) Knapp

133. The Novel in Russia and the West. (4) Course may be repeated once for credit with consent of instructor. Three hours of lecture per week. Study of major novel Russian and Western (European and American) 19th- and 20th-century novels, and their interrelations. Variable reading list. See Department announcement for description. (F,SP) Knapp

134A. Gogol. (3) Three hours of lecture per week. Gogol’s complete fiction and plays. Staff

134B. Turgeniev and Goncharov. (3) Three hours of lecture per week. The heyday of Russian Realism in two major nineteenth-century Russian novelists. Practice in critical approaches. Staff

134C. Dostoevsky. (4) Three hours of lecture per week. A survey of the writer’s principal artistic works, treated in relation to his life and to developments in Russian and European literature. Extensive outside reading required for this course. (F,SP) Staff

134D. Tolstoy. (4) Three hours of lecture per week. A survey of the writer’s principal artistic works, treated in relation to his life and to developments in Russian and European literature. Extensive outside reading required for this course. Staff

134E. Chekhov. (3) Three hours of lecture per week. Studies in the innovative master of modern narrative forms: short story, drama, letter. Extensive exposure to the life and times of Anton Chekhov. Practice in critical approaches to literature and theater. Writing intensive course. (F,SP) Staff

134F. Nabokov. (4) Three hours of lecture per week. A thorough examination of Nabokov’s work as a novelist, critic, and memoirist. Explores Nabokov’s fiction from his European and American periods, his (imagined) relation to literary predecessors and his construction of an authorial self. Extensive outside reading required for this course. (F,SP) Staff

134N. Studies in Russian Literature. (3) Course may be repeated for credit by consent of instructor. Three hours of lecture per week. Variable subject matter; see departmental announcement for description. Staff

134R. Research in Russian Literature. (1) Course may be repeated for credit with consent of instructor. Prerequisites: Consent of instructor. Special research project to be coordinated with lecture course in the Slavic 134 series (Slavic 134A-B-C-D-E-F-N). 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) Staff

136. The Russian Novel. (3) Three hours of lecture per week. Formerly 134. A study of major novels by Russian 19th- and 20th-century authors. Lectures and readings in English. Aimed primarily at non-majors, but may be used in satisfaction of upper division requirements for the major. Variable reading list (see course descriptions in the department). (F,SP) Staff

137. Introduction to Slavic Linguistics. (3) Students who have taken 220 may not receive credit for 137. Three hours of lecture per week. Prerequisites: Two years of a Slavic language or consent of instructor. An introduction to the Slavic languages, their structures and histories, and descriptive and theoretical principles for their analysis. The origin and ancient history of the Slavs. Staff

137R. Slavic Studies Research. (1) Individual consultation. Research project to be approved by the instructor. Prerequisites: Consent of instructor. Special research project to be coordinated with lecture course for Slavic 137. Supervised by the instructor of the lecture course in which the student is also enrolled. Final research paper of 10-15 pages required. Staff

138. Topics in Russian and Soviet Film. (4) Course may be repeated for credit as topic varies. Three hours of lecture and two hours of screen viewing per week. This course will examine the Russian contribution to film history and theory, with particular attention paid to the relationship of the cinema in Russia to other forms of the cultural and political movements. Staff

146. East/West Encounters: The Literatures of Orientalism. (4) Three hours of lecture per week. The course will explore the ways in which Asia or the Orient has been figured in twentieth-century Russian and Russian literary traditions from the 18th to the early 20th centuries. We will be interested in the different modes of exoticism, from the stereotypic to the revelatory, that have marked the meetings between "east" and "west"
in the wake of the imperial cultures of Europe. (F,SP)
Ram

148. Topics in Russian Cultural History. (4) Course may be repeated for credit. Three hours of lecture/discussion per week. This course examines various dimensions of Russian culture—social, political, artistic, literary—in public and private life. The theory and method of cultural studies will be addressed, as well as contemporary historical material pertaining to Russia. Topic and period variable. Instruction and texts in English, but students with a working knowledge of Russian are encouraged to do some reading in the original. (F,SP) Staff

160. Studies in Russian Literature. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 103A (which may be taken concurrently). Variable subject matter; see departmental announcement for description. Staff

181. Readings in Russian Literature. (4) Three hours of lecture per week. Prerequisites: 103A (which may be taken concurrently). Study and analysis of the development of the Russian literary language and short fiction from the eighteenth century to the present. (F) Staff

182. Pushkin. (4) Three hours of lecture per week. Prerequisites: 103A (which may be taken concurrently). A survey of the writer's principal artistic works, treated in relation to his life and to developments in Russian and European literature. (F,SP) Staff

188. Russian Prose. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 103B (may be taken concurrently). Course conducted in Russian. Reading, analysis, and interpretation of representative authors from the nineteenth century to the present. (SP) Staff

190. 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 a wide range of sources from the 19th and 20th centuries—works of fiction, publicistics, 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 American students studying Russian and Russians living in America. All readings, lectures, and discussions in Russian. (F,SP) Paperno

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 staff permissions. (F,SP) Staff

Upper Division Courses

117A. Advanced Bulgarian. (4,4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 117A is prerequisite to 117B. May be taken concurrently. Variable subject matter; see departmental announcement for description. Staff

117B. Advanced Bulgarian. (4,4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 27B is prerequisite to 117B. May be taken concurrently. Course sequence begins in the fall. (F,SP) Staff

Upper Division Courses

117A-117B. Advanced Serbian/Croatian. (4,4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 27B is prerequisite to 117B. May be taken concurrently. Course begins in the fall. (F,SP) Staff

Russian

170. Survey of Yugoslav Literatures. (3) Three hours of lecture per week. Outline of major developments in Serbian (including Montenegro) and Croatian (including Dalmatia) literatures from the beginnings to the present. No knowledge of Serbian/Croatian required. (F,SP) Alexander

171. Readings in Yugoslav Literatures. (4) Course may be repeated for credit with consent of instructor. Three hours of reading per week. Prerequisites: 117A. Selected readings in Serbian/Croatian literary or linguistic or conversational, depending on the needs of the students enrolled. Alexander

General and Other Slavic

Lower Division Courses

R5A-R5B. Writing and Reading about Russia. (4,4) Three hours of lecture per week. Prerequisites: Subject A or equivalent for 5A; 5A or equivalent for 5B. Formerly 5A-R5. Course base reading and composition on works of Russian writers, either in English or translated into English. As students develop strategies of writing and interpretation, they will become acquainted with a theme in Russian literature and its major voices. R5A satisfies the first half of the Reading and Composition requirement, and R5B satisfies the second half. (F,SP) Staff

39. Seminar for Lower Division Students. (3) Course may be repeated for credit as topic varies. Three hours of seminar per week. Variable topics involving the cultural histories, languages, or literatures of Slavics. Course work will include library research and one or more papers. No knowledge of a foreign language required. (F,SP) Staff

50. Introduction to Russian/East European/Eurasian Cultures. (3) Three hours of lecture per week. This course introduces students to the cultures of the peoples of the former Soviet bloc (Russia and other areas of the former Soviet Union, including Central Asia and the Caucasus, and Eastern Europe), from early times to the present, with emphasis on cultural identity. Readings in history, fiction, folklore, viewing of films, and art works. Thematic units include: formation of the Russian civilization, Slavic nationalism in the Romantic era, empire and identity in Eastern/Central Europe; Soviet and post-Soviet daily life, Jews in Slavic lands, the former Yugoslavia, Russian 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

99. Individual Study. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: 3.0 GPA. Supervised independent study for lower division students with a minimum 3.0 GPA. (F,SP) Staff

Upper Division Courses

100. Seminar: Russian, East European, and Eurasian Cultures. (4) Course may be repeated for credit. Three hours of seminar per week. An in-depth study of cultural history, literature, language, and social

Serbian/Croatian

Lower Division Courses

27A-27B. Introductory Serbian/Croatian. (5,5) Five hours of lecture per week. Prerequisites: 27A is prerequisite to 27B. Beginner's course. Sequence begins in the fall. (F,SP) Staff

Upper Division Courses

117A-117B. Advanced Serbian/Croatian. (4,4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 27B is prerequisite to 117B. May be taken concurrently. Course begins in the fall. (F,SP) Staff

149AC. Ideology and Ethnicity: Images of Soviet Russia in American Culture. (4) Three hours of lecture/discussion per week. This course is the role played by images of Soviet Russia in the African-American, Chicano, and Jewish communities since 1917. We will examine a wide range of images—movies, memoirs, periodicals, and films—as we consider the ways the Soviet model has served as a catalyst for the reconsideration of ethnic, racial, and class identities in the United States. This course satisfies the American cultures requirement. (F,SP) Nesbet

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 Eastern 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 conference. Prerequisites: Overall and major grade point average of 3.3. Study and research on a topic selected by the student in consultation with the faculty advisor, to culminate in the writing of an honors thesis. Separate departmental 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) not covered by regularly scheduled courses. (F,SP) Staff

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B prefix=language course for business majors
C prefix=course satisfies R&C requirement
H prefix=cross-listed course
AC suffix=course satisfies American cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
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) Staff

235. Slavic Oral Epic. (4) Three hours of lecture per week. Prerequisites: 103B or 117B, or consent of instructor. Advanced knowledge of either Serbian/Croatian or Russian. A comparison of Russian and South Slavic oral epic. Stylistic and poetic analysis of Serbian/Croatian and Russian texts with special attention to Parry-Lord oral formulaic theory. (SP) Alexander

270. South Slavic Oral Tradition. (4) Three hours of lecture per week. Oral epic songs of the South Slavs. (F,SP) Alexander

280. Studies in Slavic Literature and Linguistics. (4) Course may be repeated for credit. Two hours of seminar per week. Advanced studies in the several fields of Slavic literatures and linguistics. Content varies. (F,SP) Staff

298. Special Study for Graduate Students. (2-3) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Course to be repeated for a maximum of 16 units. (F,SP) Staff
B prefix=language course for business majors C prefix=course cross-listed course H prefix=honors course R prefix=course satisfies R & C requirement AC suffix=course satisfies American cultures requirement

Undergraduate Program, College of Letters and Science

Under the jurisdiction of the College of Letters and Science, the School of Social Welfare administers the Undergraduate Group Major in Social Welfare, Social Work, and Social Welfare Policy, leading to the A.B. degree. This liberal arts major, with a focus on the social sciences and core social welfare courses, introduces students to problems, policies, and methods in the social welfare field and allows students to test their career interest in social work before employment or graduate professional education. It also serves as a flexible preprofessional major. Before entering Social Welfare, the social welfare major admits up to 100 new students each year. Since we are often unable to accommodate all applicants, students should declare the major as soon as they have completed the required prerequisites. Students should begin the sequence of four required social welfare courses in the fall semester of their junior year so that the courses may be taken in the order recommended: 120 (F), 121 (SP), 122 (F), and 123 (SP). An elective field work course, Social Welfare 104 (SP), is available to majors who have completed 103. Major Requirements

Lower Division Prerequisites. Required: Psychology 1 or 2; Sociology 1, 3, or 3AC; Statistics 2, 20, 21, Political Science 3, or Sociology 5; completion of the Letters and Science Reading and Composition requirement. Recommended but not required for the major: Anthropology 3 or 3A, Economics 1, Political Science 1.

Upper Division. A minimum of 29 upper division units taken for a letter grade, including Social Welfare 100, 102, 103, and 105; and a minimum of five additional upper division courses, three of which must be taken in one of five specified social science departments. For a list of approved electives and further information on the major, contact the Social Welfare Undergraduate Office, 219 Haviland Hall, (510) 642-4407.

Honors Program. The honors program in social welfare provides an opportunity for qualified undergraduates to thoroughly investigate an area of interest, to work closely with a faculty mentor, and to produce a paper of some magnitude. Students who meet the eligibility requirements (a 3.3 grade-point average overall and in the major, and completion of Social Welfare 100 and 102) may enroll in H195 in their senior year. The fall H195 (1 unit) is a two-hour biweekly seminar addressing topic identification, library research, and the preparation of an annotated bibliography and essay prospectus. The spring H195 (3 units) is an individual tutorial in which students prepare the honors essay under the supervision of their faculty essay advisors.

Graduate 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 will be thoroughly grounded in a knowledge of social and behavioral sciences, social welfare policies and 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 in developing and applying intervention methods. Classroom preparation focuses on knowledge of individual and family development, ethnocultural factors, policies and institutional systems, 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 higher education because of race, socioeconomic background, disability, geography, or discrimination. Students and faculty are committed to addressing demographic changes in the state of California and the nation in order to respond to the values and needs of the social work profession. These include recognizing the worth, uniqueness, and dignity of all individuals, fostering and maintaining family and other social support systems, and promoting equitable opportunity and social and economic welfare for all.

The school offers the following programs:

- A program of study leading to the Ph.D. in Social Welfare, which prepares students for careers in teaching, research, policy development and analysis, research administration, social welfare policy, 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.
- Also offered is a combined program of master’s-doctoral studies which begins in the first graduate year, leads to both Master of Social Welfare and Ph.D. in Social Welfare degrees, and prepares for the same careers. Applicants must show evidence of ability to complete doctoral study successfully and must have undergraduate preparation as outlined below.
- A two-year program of study for the Master of Social Welfare degree in preparation for advanced practice in social work. Classroom and field courses are designed to teach professionals to use tested knowledge and skills and research methods in their practice. Applicants for admission must have strong academic preparation in the liberal arts and sciences, including course work in the social and behavioral sciences. In addition, introductory coursework in social welfare and social work, research methods, and quantitative reasoning is given special attention. Knowledge of the social welfare field and proficiency in 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 knowledge and commitment through voluntary experience may also qualify.

The school sponsors several special programs: the M.S.W./M.P.H. 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.

Applications for admission to any of these programs should be submitted as early as possible beginning in September and no later than early fall.
January for admission in the following academic year. The deadline for fellowships is mid-December 15. Please see the school’s web site for exact deadlines: http://hasv45 socwel berkeley edu. Admission to the school is contingent upon admission to graduate standing. For further details see the booklet Admission to Graduate Study.

The M.S.W. program is accredited by the Council on Social Work Education.

For further information, consult the Announcement of the School of Social Welfare, available from the School Office, 120 Haviland Hall or visit our web site at http://hasv45 socwel berkeley edu.

Lower Division Courses

10. Social Problems and the Emergence of the Welfare State. (2) Two hours of lecture/discussion per week. Social problems, by definition, are fabrications of social structures. This course is ad- dressed to lower division students—will examine contemporary social problems from an historical vantage point. How did phenomena which are currently considered as social problems come about? How did society learn to address and, at times, cope with them? What forces shaped the contour of these problems and what dynamisms operated to identify “solutions” to them? This course will consider the relationships between problems that contemporary American society sees as most worthy of attention: crime, poverty, homelessness, immigration and ethnic diversity, and family disorganization and child abuse. It will examine how these issues have appeared, disappeared, and reappeared over time and how people and social institutions have responded. The construction of the welfare state (and what is defined in this present day context) will be a critical theme underlying the historical focus of the course.

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, ranging from department 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 organizations. Regular individual meetings with faculty supervisor and written reports required. (F,SP) Staff

98. Group Study in Social Welfare. (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

100. Social Welfare Policy. (3) Two hours of lecture and one hour of discussion per week. Analysis of social welfare policies and programs including public assistance, social insurance, social services, and health and mental health. (SP) Terrill

102. Social Work as a Profession. (3) Two hours of lecture and one hour of discussion per week. 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) Grossman

103. Practice in Social Work. (3) Two hours of lecture and one hour of laboratory/discussion per week. An introduction to the basic skills of interpersonal helping and problem solving and to related theory and research. (F,SP) Staff

104. Field Study in Social Work. (4) Must be taken on a passed/not passed basis. Prerequisites: 103. Supervised field work in social agencies plus university-based integrative seminars. Open only to social welfare majors meeting minimum requirements. (SP) Staff

105. Current Topics in Social Welfare. (2) Course may be repeated for credit with consent of instructor. Two hours of lecture per week. Prerequisites: 100, 102. Course examines current problems and issues in the field of social welfare. Staff

C151. Asian Americans: Cultural, Psychological, and Social Work Perspectives. (2) Two hours of lecture/discussion per week. Course provides an overview of the Asian American experience from a psychological perspective. Examines Asian American cultural values, the process of psychological adaptation, ethnic identity formation, implications for social work practice, and culturally sensitive service delivery and treatment. Also listed as Psychology C137. (F) Ying

H195. Senior Honors Course. (1-3) Course may be repeated for credit. Tutorial conference. Prerequisites: 100. Preparation of an honors thesis. (F,SP) Teryl

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. Tutorial conference. Must be taken on a passed/not passed basis. Enrollment is limited by regulations specified in the General 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 cycle in the context of different social environments. (F) Staff

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) Staff

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.

210B. Interventions. (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. Staff

210C. Aging Processes. (2) Two hours of lecture per week. Prerequisites: 200. Sociological, psychological, and physiological variables relevant to the assessment of older persons. Schlarach

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 reformulation of clinical case studies and psychobiographies. Runyan

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 physical or emotional strain. How networks operate; their accomplishments and limitations; the role and skills of professionals in assessing and utilizing networks for clients. Snowden

210G. Lesbian and Gay Issues in Social Work. (2) Two hours of seminar/discussion per week. This course will help students better understand gay, lesbian, bisexual, and transgendered men’s and women’s lives by providing an opportunity to explore issues such as homophobia, oppression, identity-development, “teen-gays,” HIV/AIDS, domestic violence, safe sex, couple-counseling, gay marriage, parenting, and aging. Students will also acquire a greater knowledge within the community and national resources available to this population. (SP)

C210H. Perspectives in Personality: Personality Theory. (2) Two hours of seminar per week. Major approaches to personality theory, including psychodynamic, 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 C250E. Runyan

210I. Group, Organizational, and Community Dynamics. (2) Two hours of lecture 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,SP) Austin

220. Introduction to Social Welfare Policy. (3) Two hours of lecture per week. Analysis of issues in social welfare policy and recent trends shaping the development of the American welfare state. (F) Gilbert

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. Prerequisites: 200. Seminar to develop critical thinking and practice issues 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 and skill required to assess the needs for societal supports 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. (SP) Staff

234A. Law and Social Welfare: Children and Families. (2) Two hours of lecture per week. Legal information and policy discussion for 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 in Health and Mental Health encountered by social workers. Topics include reproductive rights, AIDS, right to treatment. Staff

234C. Legal Issues in Aging. (2) Two hours of lecture/discussion per week. Legal information, policy discussion, and advocacy skills for social workers and
243. Direct Practice in Child and Family Settings. (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 economic context of homelessness, examines 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

23BB. Drug and Alcohol Policy. (2) Two hours of lecture per week. Examines how substance abuse policy is formulated by examining political, historical, epidemiological, and economic factors. Emphasizes how alcohol and drug programs become defined as social problems and how these definitions influence subsequent treatment/intervention strategies. Focus on alcohol abuse and overcontrol and social control models of substance abuse. In addition, the development and evaluation of alcohol and drug abuse treatment will be discussed. Midanik

23BC. Health Policy—A Social Welfare Perspective. (2) Two hours of lecture per week. Deliberates issues and problems of the health care field. Course considers the social context of health care; the roles of the public, voluntary, and private sectors; and the implications of social policies and programs for society and the individual client. (SP)

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, work and family. We examine these issues from an interdisciplinary perspective, drawing from law, history, psychology, and other social sciences. Staff

240. Introduction to Social Welfare and the Profession of Social Work. (1) Fifteen hours of lecture per quarter with one on a satisfactory basis. Course explores the history, development, and mission of the field and profession, fundamental social work tasks, and the organizational context of practice. (F) Grossman

241. Foundations of Social Work Practice: Generalist Social Work. (2) Two hours of lecture/discussion per week. Course provides an introduction to the fundamental values, knowledge, processes, and skills of social work practice at all levels of intervention, including individual, family, and group; organizations, and communities. Addresses foundation practice theory, critical thinking, modes of empirically-based practice, the bio-psycho-social perspective, and key theoretical frameworks. First-year front-end interventions such as planning, assessment, and intervention are taught through case examples. Basic interviewing skills are conveyed employing experimental techniques such as role play and group exercises. (F) Staff

242. Foundations of Social Work Practice: Groups, Organizations, Communities. (2) Two hours of lecture/discussion per week. Prerequisites: 241. Course continues macro social work practice. Provides basic skills and concepts for group, agency, and organizational practice and introduces core social work roles from the perspective of the direct practitioner and the organizational perspective. The course uses teaching cases that involve multiple levels of intervention and multiple uses of field-based assignments. (SP) Staff

243. Direct Practice in Child and Family Settings. (2) Two hours of lecture/discussion per week. Prerequisites: 241. Planning, implementing, and evaluating services for clients with major mental disorders or at risk of developing mental illness. Review of intervention models addressing the needs of clients for basic resources, social rehabilitation, and clinical treatment. (SP) Manoleska

245. Direct Practice in Health Settings. (2) Two hours of lecture/discussion per week. Prerequisites: 241. Examines the range of therapeutic modalities used by social workers in health care; the interaction of health care policies and practices; interdisciplinary issues; and the ethical dimensions of practice. (SP) Segal

246. Direct Practice in Aging Settings. (2) Two hours of lecture/discussion per week. Prerequisites: 241. Comprehensive assessment of the elderly, normal and abnormal; dimensions of the aging process; and the major therapeutic models for working with the elderly. (SP) Scharlach

250A. Social Work with Groups. (2) Two hours of lecture per week. Prerequisites: 241. Theory and practice regarding the formation, sustenance, and termination of groups. Emphasis on the role of the social worker in facilitating interpersonal processes in groups. Staff

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 a historic and psychodynamic perspective. Provides assessment criteria for assignment to these forms of treatment and techniques for intervention.

250D. Psychoterapeutic Methods with Adults. (2) Two hours of lecture per week. Prerequisites: 241. Treatment planning and applications for clinicians. Examines supportive treatment, depression and suicide management and treatment, and brief and long range expressive psychotherapy and other intervention models. (F) Loughran

250E. Comparative Psychotherapies. (2) Two hours of lecture/discussion per week. Prerequisites: 241. Examines common and unique elements in the major theoretical orientations to the practice of psychotherapy. Staff

250F. Clinical Practice with Women. (2) Two hours of lecture/discussion per week. Prerequisites: 241. Utilizing a variety of developmental and practice theories and informed by feminist practice, this course focuses on clinical practice with women of all ages, classes, and cultures. Given to (1) the context of women’s lives, (2) the assumptions practitioners bring to their work with women, and (3) practice with specific populations such as adolescent women, lesbians, and disabled women. (SP) Staff

250G. Psychodynamically Oriented Social Work Practice with Adults. (2) Two hours of lecture/discussion per week. Prerequisites: 241. Course examines clinical skills for working with adult clients from a psychodynamic perspective. Key concepts and processes in the formation of a therapeutic alliance, resistance, transference, counter-transference, and the development of interventions, are discussed and illustrated with case vignettes.

250H. Social Work Practice with Asian American's. (2) Two hours of lecture per week. Prerequisites: 241. Course aims to sensitize and enhance the students’ understanding of the mental health of Asian Americans. Earlier Asian migrants from China, Japan, and Korea will be contrasted with more recently arrived refugees and immigrants from Vietnam, Cambodia, and Laos. Effective clinical interventions with these groups will be discussed. Ying

250J. Social Work with Latino Populations. (2) Two hours of lecture per week. Prerequisites: 241. Examines major social problems and mental health issues confronting Chicano and other Latino groups in the U.S. Emphasis on the assessment and treatment of psychosocial problems. Organista

250L. Social Work and Human Sexuality. (1,2) One hour of lecture/discussion per week per unit. Prerequisites: 241. Course examines issues of human sexuality from broad cultural perspectives to specific individual concerns. Topics include developmental perspectives on sexuality; sexual orientation, gender, and lifesties; sex and AIDS, disability, and illness; sex and violence; and sex therapy. (SP) Manoleska

250M. Death and Dying. (2) Two hours of lecture/seminar per week. This course explores death and dying from a variety of perspectives: psychological, philosophical, cultural, spiritual, and phenomenological. Emphasis is placed on understanding the experiences of dying individuals and their families and the interplay between the process of dying and the process of living. Implications for social work interventions are discussed. This course is both academic and experiential, relying on a wide variety of materials: autobiography, fiction, scholarly and theoretical writings, case examples, films, poetry, and guest lectures. Scharlach

250NA. Public Child Welfare Services. (1) Two hours of lecture/seminar every week. Prerequisites: 241. First part of two-semester course designed for students preparing for careers in public child welfare. Fall term examines continuum of services, common clinical case management themes, impact of chemical dependency and domestic violence, decision making and intervention models, and placement of social work within the legal context of the dependency court. (F) Gilson

250NB. Public Child Welfare Services. (1) Two hours of lecture/seminar every week. Prerequisites: 241, 250NA. Second part of two-semester course designed for students preparing for careers in public child welfare. Spring term addresses the range of documentation required for legal purposes, practice issues for social workers within the court setting, and skills required in presenting testimony. (SP) Gilson

250R. Social Work with Adolescents. (2) Two hours of lecture/discussion per week. Prerequisites: 241. This course will focus on the methods for the assessment and treatment of disturbed and delinquent adolescents. Psychosocial, psychodynamic, sociocultural and ecological perspectives on adolescents will be examined. A variety of early intervention and treatment modalities will be explored.

250S. School Social Work. (2) Two hours of lecture per week. Prerequisites: 241. Course addresses the competency requirements for the California Pupil Personnel credential. Examines the organizational context of school social work; practice models for working with parents, children and youth in the school context; issues of child abuse and handicaps; psychosocial and career guidance; conflict resolution; and career and curriculum counseling. (F) Kitada

250U. Substance Abuse Treatment. (2) Two hours of lecture per week. Prerequisites: 241. Course provides an introductory overview of various theories and methodologies currently used in the diagnosis and treatment of substance abuse disorders. Though 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. Manoleska

250V. Child Welfare and Attendance in Social Welfare. (1) Fifteen hours of lecture/discussion per semester. Course addresses all aspects of child welfare and attendance in a social work context, including assessment, intervention, and related legal information. Staff

250W. Standard Tests in Education. (1) Fifteen hours of lecture/discussion per semester. An introduction to the development, selection, administration, and interpretation of tests used in education for school social workers.

251. Community Practice. (2) Two hours of seminar per week. This course provides an overview of the theories, knowledge, and skills required for community organization, needs assessment, and program planning and development. Course focuses on developing community...
munity-based interventions in a diverse society. (SP) Chow

252. Management Practice. (2) Two hours of lecture per week. Basic theories, areas of knowledge, and practice skills for the administration of human services. Topics include program development and implementation, related community groups, staff development, supervision, training and finance. (F) Austin

254. Policy Practice. (2) Two hours of seminar per week. Course introduces the practice of social welfare policy making. Focusing on the California State Legislature, students in the first half of the course are taught policy analysis skills, lobbying, testifying, working with legislators, legislative staff, and the media, and forwarding a policy agenda. In the second half of the course, students implement their policy work in an environment that involves agency change, address the use of management information systems and outcomes measurement as strategies for information collection, and learn skills for effectively using information to improve agency decision making. (F) Bemrick

255. Community Organizing. (2) Two hours of lecture/discussion per week. Introduction to the theory and practice of community organization. Staff

257. Financial Management in Social Welfare Organizations. (2) Two hours of lecture/discussion per week. Theories and practices of financial management are applied to social service organizations. Students will learn tools and techniques for effective planning and budgeting as well as an integrated system to evaluate, forecast, and revise plans. Accounting principles and systems will be examined from a management perspective with an emphasis on designing systems to meet the unique management information needs of different organizations. The use and development of internal and external financial statements will be covered. Students will learn the tools and techniques of financial statement analysis, interpretation, and presentation. The course is designed to develop the core financial management skills needed by middle and middle managers in large and small social service organizations. (SP) Staff

270. Access to Human Services Among Low Income and Minority Populations. (2) Two hours of seminar per week. Course examines how services can be made effective and appropriate for minorities and the poor. Problems of utilization will be considered with respect to: cultural beliefs and expectations; self-help and indigenous care; and the design of service systems. Focus on health care, mental health, and services for children and families. Snowden

272. Social Work Practice with Ethnic Minority Populations. (2) Two hours of seminar per week. Theories of migration, transnational, and adaptation will be addressed, along with skills required for working with refugees and immigrants facing difficulties. Address the impact of policy on how services are delivered to U.S. and the circumstances newcomers and their families face once here. (SP) Staff

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) develops a creative and 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-rejection and interactive exercises, and (3) promotes diversity competent practice skills. (F)

279. Seminar in the History and Philosophy of Social Welfare. (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 the theory and practice of research in social welfare. (SP) Staff

282A-282B. Seminar in Social Welfare Research. (2,2) Two hours of seminar per week. Prerequisites: 280. Problem formulation, design, and implementation. (F,SP) Staff

285A-285B. Statistics for Social Workers. (1,1) Two hours of laboratory/discussion per week. Prerequisites: To be taken concurrently with 142A-142B. Foundation and theory underlying introductory statistical methods. Course focuses on statistical applications in areas of social welfare. (F,SP) Waters

286. Statistical Analysis Using the Computer. (1) Two hours of lecture per week for eight weeks. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Introductory course in statistics. Introduction to computer-based statistical analysis and research methods. Course emphasizes the practical application of statistical methods and techniques in social work research. Focus on general linear models, specifically linear regression, analysis of variance, correlation, parameter estimation, and non-parametric methods. (SP) Staff

287. Introduction to Library Resources and Faculty Research. (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. Students will be shown how to use the library's reference works, bibliographic aids, and computer data bases. Individual faculty members will present their research emphasis, methodology, outcomes and contribution to social welfare. (F) Staff

289A. Research Methods and Techniques in Social Welfare. (2) The logic of social research: topics include rationale and procedure of research design, validity, reliability, and an introduction to sampling. (F) Midanik

289C. Introduction to Regression. (3) Four hours of lecture/discussion per week. Prerequisites: Public Health 142A-142B or equivalent. 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. (F)

289D. Estimating Models with Qualitative and Limited Dependent Variables. (3) Four hours of lecture/discussion and computer laboratory per week. Prerequisites: 289C or equivalent. Examines linear stochastic models of count and limited dependent variables measured with limited dependent variables. Course objectives include: recognizing limited dependent variables; modeling, estimating, and understanding the statistical theory and computational methods underpinning estimation. Exercises use a “hands-on” computer laboratory format. Application to dissertation work is emphasized. L. Miller

295. Dissertation Seminar. (2) Two hours of seminar per week. The purpose of this seminar is (1) to develop research skills by integrating issues of research design with measurement, data analysis, and report writing, and (2) to prepare students for their dissertation research. The course is concerned with the practice of teaching in social welfare, and addresses specific skills, such as syllabus design, instructional methods, coverage of diversity content, student assignment and evaluation, use of technology, advising, mentoring, and working with English and Spanish speaking teachers. Using an interactive format, students are encouraged to share their own learning and teaching experiences, and to progress in their development as teachers. (SP) Staff

301. Training in Teaching. (1-6) Course may be repeated for credit. Supervised teaching assistantship. Must be taken on a satisfactory/unsatisfactory basis. One unit will be awarded for each four hours per week of student work. (SP) Staff

400. Introductory Practicum. (1) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Introduction to the range of professional roles and services in social welfare through university-based seminars, agency visits, and professional panels. Taken in the first semester of the MSW program. (F) Staff

401. Field Practicum. (1-10) Course may be repeated for credit. One unit of credit awarded for each four hours per week of practicum work. Must be taken on a satisfactory/unsatisfactory basis. Supervised field work in social agencies and university-based group meetings. (F,SP) Staff

402. Advanced Field Seminar. (1) One hour of seminar per week. Taken in conjunction with 401 (field instruction). Must be taken on a satisfactory/unsatisfactory basis. Supervised field work in agencies and university-based group meetings. (F,SP) Staff

403. Training in Research. (1-6) Course may be repeated for credit. Supervised research assistantship. Must be taken on a satisfactory/unsatisfactory basis. One unit will be awarded for each four hours per week of student work. (SP,SP) Staff

299. Individual Research for Graduate Students. (1-12) Course may be repeated for credit. One unit will be awarded for each four hours per week of student work. Prerequisites: Consent of instructor. Designed to permit qualified graduate students to pursue research in a subject area of their choosing under the direction of a faculty member. (F) Staff

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. One unit will be awarded for each four hours per week of student work. 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. (F,SP) Staff

Professional Courses

300. Teaching in Social Welfare. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. This seminar aims to prepare doctoral students for teaching in social welfare. The course is divided into two parts. The first part examines education from the perspective of the student and the teacher, and their interface. It reviews philosophies and theories of adult education, and underscores the importance of critical reflection, both on the part of the teacher and the student. The second part of the course is concerned with the practice of teaching in social welfare, and addresses specific skills, such as syllabus design, instructional methods, coverage of diversity content, student assignment and evaluation, use of technology, advising, mentoring, and working with English and Spanish speaking teachers. Using an interactive format, students are encouraged to share their own learning and teaching experiences, and to progress in their development as teachers. (SP) Staff

301. Training in Teaching. (1-6) Course may be repeated for credit. Supervised teaching assistantship. Must be taken on a satisfactory/unsatisfactory basis. One unit will be awarded for each four hours per week of student work. (SP) Staff

400. Introductory Practicum. (1) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Introduction to the range of professional roles and services in social welfare through university-based seminars, agency visits, and professional panels. Taken in the first semester of the MSW program. (F) Staff

401. Field Practicum. (1-10) Course may be repeated for credit. One unit of credit awarded for each four hours per week of practicum work. Must be taken on a satisfactory/unsatisfactory basis. Supervised field work in social agencies and university-based group meetings. (F,SP) Staff

402. Advanced Field Seminar. (1) One hour of seminar per week. Taken in conjunction with 401 (field instruction). Must be taken on a satisfactory/unsatisfactory basis. Supervised field work in agencies and university-based group meetings. (F,SP) Staff

403. Training in Research. (1-6) Course may be repeated for credit. Supervised research assistantship. Must be taken on a satisfactory/unsatisfactory basis. One unit will be awarded for each four hours per week of student work. (SP,SP) Staff
Sociology
(College of Letters and Science)

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Professor Emeritus
Neil J. Smelser, Ph.D. Harvard University. Theory, economics, social change

Professors
Victoria E. Bonnell, Ph.D. Harvard University. Historical, labor, Russian society
Michael Burawoy, Ph.D. University of California. Labor, comparative, political economy
Manuel Castells, LBL. Ph.D. University of Paris. Urban sociology
Nancy J. Chadwick, Ph.D. Brandeis University. Feminist theory, family, psychoanalysis
Robert E. Cole, Ph.D. University of Illinois. Organizations, economic, political quality
Harry Edwards, Ph.D. Cornell University. Race, sport, family
Peter Evans, Ph.D. Harvard University. Comparative development, Latin America, state and industrialization
Claude S. Fischer, Ph.D. Harvard University. Urban sociology
Neil Fligstein, Ph.D. University of Wisconsin. Social movements, political sociology, gender, research methods
Michael Hout, Ph.D. Indiana University. Demography, methods, occupations, stratification
Jerome Karabel, Ph.D. Harvard University. Education, stratification, institutional politics
Kristin L. Yu, Ph.D. Duke University. Gender, population, medicine
Richard J. Ofshe, Ph.D. Stanford University. Thought reform, sociology
Trond K. Petersen, Ph.D. University of Wisconsin. Career systems, payment systems, organizational behavior
Martin Sherman, Ph.D. Massachusetts Institute of Technology. Deviance, Deviance, social, urban, youth
Ann Swedler, Ph.D. University of California, Berkeley. Culture, religion, theory, organizations
Barrie Thorne, Ph.D. Brandeis University. Gender, theory, childhood
Margaret Weir, Ph.D. University of Chicago. Political sociology
Robert Blauner (Emeritus). Ph.D. University of California, Berkeley. Race, gender, work, age
Kenneth E. Bock (Emeritus). Ph.D. University of California, Berkeley. Theory, social evolution
Kingsley Davis (Ford Professor of Sociology and Comparative Studies Emeritus). Ph.D. Harvard University. Population
Troy Duster (Emeritus). Ph.D. Northwestern University. Deviance, social movements, law
Charles Y. Glock (Emeritus). Ph.D. Columbia University. Survey, attitudes, race
Walter Johnson (Emeritus). Ph.D. University of Chicago. Political sociology, social movements
David Aziza (Emeritus). Ph.D. Princeton University. Deviance, social change, poverty
H. Frank Schuman (Emeritus). Ph.D. Harvard University. Organizations, cities, China, America
Philip Selznick (Emeritus). Ph.D., Dr. jur. h.c. Columbia University. Law, Theory, law, organizations/institutions

Associate Professors
Laura Enriquez, Ph.D. University of California at Santa Cruz. Latin America, rural sociology, social policy
Thomas Gold, Ph.D. Harvard University. Modernization/development, comparative, China
Samuel R. Lucas, Ph.D. University of Wisconsin. Social stratification, education, research methods
Raka Ray, Ph.D. University of Wisconsin. Political sociology, social movements, gender, research methods
Kim War, Ph.D. Stanford University. Labor, movements, historical, methods
Lelo J. D. Wacquant, Ph.D. University of Chicago. Race, ethnicity and class; urban inequality, culture and economy

Assistant Professors
Gil Eyal, Ph.D. UCLA. Political sociology, post-communist studies
Dawne Moon, Ph.D. University of Chicago. Sexuality, religion

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W. Russell Elkins III, J.D. University of California at Los Angeles. Social factors in design (Architecture)
John R. Leimgruber, Ph.D. University of Wisconsin. Sociology, organizational theory, Japanese management, organizational networks
Sheryl M. Messer, Ph.D. University of California at Los Angeles. Criminal justice, theory (Law)
Philippe Nonet, Ph.D. Jurisprudence, sociology of law (Law)

Michael A. Ors, Ph.D. University of California at Santa Cruz. Race and ethnicity (Ethnic Studies)
Stephen M. Shorrel, Ph.D. University of Chicago. Medical sociology, ethnicity
Jerome Skolnick, Ph.D. Yale University. Criminal justice: policy
Harold L. Wilensky, Ph.D. University of Chicago. Work, organizations, technology
John R. Wilmot, Ph.D. Princeton University. Social demography (Demography)

The Major

Students intending to major in sociology are advised to prepare a broad foundation. This will enable them to choose such areas as history, philosophy, cultural anthropology, psychology, sociology, economics, and political science.

Prerequisite Courses for the Major: A student must have successfully completed Sociology 1 and 5 as well as a course in either statistics or logic before entering the major. Students who have received credit for more than two upper division sociology courses before taking an introductory sociology course must substitute another core course for Sociology 1 .

Students are required to have a 2.0 grade-point average both cumulative and in the major to be eligible to declare the major.

Upper Division. A student must take the following courses:
2. Three courses from the following core list: 110, 111, 112, 113, 115, 126, (or 125AC), 130, 131A (or 131AC), 131B, 133, 140, 150, 160, 170, (or 170AC), 171, 172.
3. Three additional courses which must be upper division sociology courses numbered 110C-196, or graduate sociology courses (subject to instructor approval). Courses taken from the core list in excess of the three required, or additional upper division seminar courses, will count as electives, as will non-core courses.
4. One 90 or 190 seminar.
5. Sociology 5, 101A, and 101B must be completed with at least a C-grade.

Honors Program. Majors who enter their senior year with a 3.3 grade-point average overall and a 3.3 grade-point average in the major may apply to the honors program, after conferred with a major advisor, by successfully completing Sociology H190A-190B, Senior Honors Thesis and Seminar.

Students who plan to go on to graduate work in sociology or other related disciplines and professions are strongly urged to take both Sociology 105 and 106.

The Graduate Program

Information about the graduate program and admissions may be obtained from the departmental office, 410 Barrows Hall, (510) 642-1657. Applications are accepted for the fall semester only; the deadline is December 15.

Courses

For more detailed information about the courses that follow, course descriptions are available in the departmental office, 410 Barrows Hall, several weeks before the beginning of each semester.

Lower Division Courses

1. Introduction to Sociology. (4) Not open to students who have taken 3A or 3AC. Two hours of lecture and two hours of discussion per week. Introduces students who are considering majors in sociology to the basic topics, concepts, and principles of the discipline. This course is required for the major; or 1 or any version of 3 is prerequisite for other sociology classes; students not considering a sociology major are directed to any version of 3.
2. Principles of Sociology. (4) Students will not receive credit for 3 or 3AC after taking 1. Deficiency in 3A or 3AC cannot be removed by completing 3. No credit for 3A or 3AC. Three hours of lecture per week. An overview of sociology for students who will not select the field. Sociology, culture, intervention approaches to the study of fundamental problems of group life—society, organization, culture, interaction processes and socialization—and the dynamics of modern society. Satisfies prerequisite for other sociology courses, but not for major.
3. Principles of Sociology. (4) Students will not receive credit for 3 or 3AC after taking 1. Deficiency in 3A or 3AC cannot be removed by completing 3. No credit for 3A or 3AC. Three hours of lecture per week. An overview of sociology for students who will not select the field. Sociology, culture, intervention approaches to the study of fundamental problems of group life—society, organization, culture, interaction processes and socialization—and the dynamics of modern society. Satisfies prerequisite for other sociology courses, but not for major.

Chair: Michael Burawoy, Ph.D.
Department Office: 410 Barrows Hall, (510) 642-4766
W. Russell Ellis, Jr., Ph.D. University of California at Los Angeles. Social factors in design (Architecture)
Neil Fligstein, Ph.D. University of Wisconsin. Social movements, political sociology, gender, research methods
Robert E. Cole, Ph.D. University of Illinois. Organizations, economic, political quality
Harry Edwards, Ph.D. Cornell University. Race, sport, family
Peter Evans, Ph.D. Harvard University. Comparative development, Latin America, state and industrialization
Claude S. Fischer, Ph.D. Harvard University. Urban sociology
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Sheryl M. Messer, Ph.D. University of California at Los Angeles. Criminal justice, theory (Law)
Philippe Nonet, Ph.D. Jurisprudence, sociology of law (Law)
101C. Contemporary Sociological Theory. (4) Three hours of lecture per week. Prerequisites: 101A-101B or consent of instructor. A systematic study of the work of selected social theorists of the post-WWII era. This course will cover the diversity of thought in the field and will follow a comparative approach to the study of theory. The choice of theorists to be covered will vary according to the instructor.

102. Advanced Study in Social Theory. Three hours of lecture per week. Prerequisites: A course in social theory or consent of instructor. Courses under this number involve pursuing study in subfields of sociological theory. The courses presume a general background in social theory. Consult instructor as to whether your background is appropriate.

C102A. Marx and the Marxist Tradition. (3) Three hours of lecture per week. Prerequisites: 102 or consent of instructor. This course includes significant readings from Karl Marx's writings of both the early and late period. Selected readings by Friedrich Engels, Georg Lukacs, Antonio Gramsci, Lenin, Wilhelm Reich, Theodor Adorno, Max Horkheimer, Herbert Marcuse, Louis Althusser, Jurgen Habermas, and others. Also listed as German C159. (F) Holub

105. Introduction to Sociological Methods. (5) Three hours of lecture and two hours of discussion per week. Prerequisites: Consent of instructor. Problems of research design, measurement, and data collection, processing, and analysis will be considered. Attention will be given to both qualitative and quantitative studies.

106. Intermediate Sociological Methods. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 105 or consent of instructor. This course will cover more technical material in quantitative research methods introduced in 105, and will include, according to discretion of instructor, a practicum in data collection and/ or analysis. Recommended for students interested in graduate work in sociology or research careers. Goodman

107A-107B. Field Research: Participant Observation. (4) Three hours of laboratory per week. Credit and grade to be awarded on completion of sequence. This course gives students both 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 for the Center for Urban Ethnography's Bay Area Study. During the fieldwork students will work under the guidance of a teaching assistant and will participate in a biweekly seminar with the professor to address issues that arise in the field. Jankowski

110. Organizations and Institutions. (4) Three hours of lecture per week. Prerequisites: 1, 3 or 3AC or consent of instructor. Administrative organizations and voluntary associations; major social institutions in industry, government, religion, and education.

111. Sociology of the Family. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 1, 3 or 3AC or consent of instructor. Systematic and comparative analysis of family structure and change: marriage, reproduction, child-rearing, marital dissolution.

C112. Sociology of Religion. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 1, 3, 3AC or consent of instructor. The course will locate 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 experience, religious symbolism, and the basis of religious community. Also listed as Religious Studies C182. Moon

113. Sociology of Education. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 1, 3 or 3AC or consent of instructor. The role of formal education in modern societies. Educational systems in relation to the religious, cultural, economic, and political forces shaping their character.

114. Sociology of Law. (4) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: 1, 3, 3A or 3AC or consent of instructor. Selected legal rules, principles, and institutions treated from a sociological perspective. Influence of culture and social organization on law in social change; social aspects of the administration of justice; social knowledge and the law.

C115. Sociology of Law. (4) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: 1, 3, 3A or 3AC or consent of instructor. Selected legal rules, principles, and institutions treated from a sociological perspective. Influence of culture and social organization on law; role of law in social change; social aspects of the administration of justice; social knowledge and the law. Also listed as Legal Studies C184. Edelman

115. Deviance and Social Control. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 1, 3 or 3AC or consent of instructor. A consideration of forms, causes, and controls of deviant behavior.

116. Sociology of Work. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 1, 3, 3AC or consent of instructor. The labor force; social control and law; occupation and professions (professionalization, professional associations vs. labor unions and other organizations); law and legal consciousness; structure of the workplace, work experience of the participants, relations of both to community and society.

117. Sport As a Social Institution. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Analysis of sport as a social institution, its structure and functions; male-female contrasts; the economic influence of sport; the roles of coach, athlete, fan—their interrelationships and complexities; current turmoil in sport and the ideological struggle which has emerged.

118. Selected Topics in Sociology of Family and the Life Cycle. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC or consent of instructor. The focus of the course will vary depending on the instructor in charge. Possibilities include cultures of caregiving, the sociology of childhood, and the sociology of childcare.

119. Society and Information Technology. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This course is aimed at undergraduate students of all backgrounds. It studies the interaction between modern information technologies and communication. Will consider how information technology as an entry point, the course provides a systematic introduction to the sociological study of information technology. Topics covered include history of information technology since the 1970s, the new global economy; development and inequality, the information city, electronic democracy, gender relations in the information society, and the transformation of work and employment. Castells

124AC. Sociology of Poverty. (4) Deficiency in 124 may be removed by completing 124AC. No credit for 124AC after 124. Three hours of lecture per week. Prerequisite: Introductory sociology or consent of instructor. This course will examine a number of theories on the causes of poverty, then turn to an examination of empirical studies concerning the trends and determinants of poverty. Followed by an examination of the everyday life of those who live in poverty and conclude with a look at social policy toward poverty. The course will focus primarily, although not exclusively, on poverty in the United States. The course will examine the impact that modern technological changes have had on the various cultures of the ethnic groups who have experienced it. It will especially examine the experiences of those who have a history of persistent poverty (i.e., African Americans, Mexicans, Puerto Ricans, American Indians) with those with intermittent patterns. The course will have a decided, although not exclusively, urban focus. This course satisfies the American cultures requirement. Jankowski

125. Urban Sociology. (4) Deficiency in 125AC cannot be removed by completing 125. No credit for 125 after 125AC. Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. The course focuses on the study of demography with an emphasis on the transformation of work and urban space: urban politics, urban planning, ethnic relations, and natural resource use, social movements and the environment, and the environmental impacts of late capitalism.

130. Social Stratification. (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 many of the social institutions we take for granted come from a biophysical world that we live in. This course seeks to explore the relationships between society and economics as they have developed throughout the last century and how they have been transformed by health care services and the environment. Course approach was historically historical and multicultural and will include readings on the social construction of nature, early industrialization, and natural resource use, social movements and the environment, and the environmental impacts of late capitalism.

131A. Race and Ethnic Relations: The United States Experience. (4) Deficiency in 131A may be removed by completing 131AC. No credit for 131A after taking 131AC. Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. This 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 attention to traditions in relations between the dominant society and the African American, Native American, Asian American, and Latino subcultures. Political and social consequences of the modernization and ethnic stratification are explored. This course satisfies the American cultures requirement. Barlow

131B. Race and Ethnic Relations: International Comparisons. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. A broad survey of race and ethnic relations in a wide variety of nations and periods, with special attention to comparisons with the present and past patterns in the United States. Emphasis on the identification of differential roles, economic, political, institutional, social psychological, and demographic processes.

133. Gender and Society: The Sociology of Women. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. A historical and comparative approach
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<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>Sociology of Men.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Study of women's varying roles, statuses, and life opportunities. Consideration of the feminist movement, past and present, with special emphasis on struggles over defining definitions of women's &quot;nature&quot; and potential.</td>
</tr>
<tr>
<td>134</td>
<td>Gender and Society: The Sociology of Men.</td>
<td>4 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>The position of men in American society examined from standpoints of socialization and role analysis; group structure, politics, and social change, and personal experience.</td>
</tr>
<tr>
<td>135</td>
<td>Sexual Cultures.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Study course examines sexual identities, communities, desires, and practices are socially, historically, and culturally constructed. We will look at how prevalent models of sexuality, as well as how a wide range of people—including lesbians, bisexuals, gay men, transgendered, and self-described queers—content the power that operates through dominant models of sexuality.</td>
</tr>
<tr>
<td>140</td>
<td>Political Sociology.</td>
<td>3 hours of lecture and two hours of discussion per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Course examines how sexual identities, communities, desires, and practices are socially, historically, and culturally constructed.</td>
</tr>
<tr>
<td>144</td>
<td>Ethnic Politics.</td>
<td>4 credit for 144AC after taking 144. Deficiency in 144 may be removed by taking 144AC.</td>
<td>Three hours of lecture per week.</td>
<td>This course examines the role of race and ethnicity in American politics by examining the experiences of both white and non-white groups.</td>
</tr>
<tr>
<td>144A</td>
<td>Social Movements and Political Action.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>An examination of major theoretical approaches in social psychology. The approaches may include: symbolic interactionism, neo-behaviorism, psychoanalysis, cognitive theories, interpersonal processes and theories of exchange.</td>
</tr>
<tr>
<td>150</td>
<td>Social Psychology.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>An examination of major theoretical approaches in social psychology.</td>
</tr>
<tr>
<td>151</td>
<td>Personality and Social Structure.</td>
<td>3 hours of lecture per week.</td>
<td>1, 3, 3AC or consent of instructor.</td>
<td>This course investigates the relations of psyche, culture, and society, drawing on writings of psychoanalysts and social and cultural theorists who use psychoanalytic approaches. Major topics include: the nature of the self; social change; the role of the individual; and the role of the group.</td>
</tr>
<tr>
<td>155</td>
<td>Sociology of Illness and Medicine.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>This course investigates the role of race and ethnicity in American politics by examining the experiences of both white and non-white groups.</td>
</tr>
<tr>
<td>156</td>
<td>Time, Reform, Influence and Social Control.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Study of the causes of social change; the role of the individual; and the role of the group.</td>
</tr>
<tr>
<td>157</td>
<td>Sociology of Culture.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Study of the major concepts, problems and institutions.</td>
</tr>
<tr>
<td>170</td>
<td>Social Change.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Study of the major concepts, problems and institutions.</td>
</tr>
<tr>
<td>171</td>
<td>Historical Sociology.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Course will seek to explain the formation of modern United States society by inquiring into the processes of social change that have brought us to the present as well as created possibilities for the future. Race, nationalism, and ethnicity and movements against racism and nationalism and for multiculturalism—annual dimensions of social change in the United States.</td>
</tr>
<tr>
<td>172</td>
<td>Development and Modernization.</td>
<td>3 hours of lecture and one hour of discussion per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Major processes of structural change in new nations. Factors and conditions influencing transformation of societies. Contributions of sociology to the analysis of major problems confronting the peoples of Africa, Asia, and Latin America.</td>
</tr>
<tr>
<td>180</td>
<td>American Society.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>An introduction to institutions, social groups, and values in contemporary Chinese society. Dynamics of social change in a revolutionary and post-revolutionary setting. Trends in the future development of Chinese society.</td>
</tr>
<tr>
<td>183</td>
<td>Contemporary Chinese Society.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Various aspects of American values and behavior patterns over time; sources of differences from other developed nations.</td>
</tr>
<tr>
<td>187</td>
<td>Social Change in Central America.</td>
<td>3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>This course will introduce students to the origins and nature of social change in contemporary Central America. A historical-political approach will be used to describe the region's development, which will lay the groundwork for understanding the emergence in recent decades of social movements promotes social change. While focusing particularly on Central America, the course will also provide the theoretical and analytical tools required to comprehend social change elsewhere in the Third World.</td>
</tr>
<tr>
<td>189</td>
<td>Selected Topics in Area Studies.</td>
<td>4 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>This course will provide a maximum of 12 units. 240-300 hours weekly per semester plus the satisfaction of an area studies requirement.</td>
</tr>
<tr>
<td>190</td>
<td>Seminar on Advanced Topics.</td>
<td>4 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Course may be repeated for credit as topic varies. Three hours of seminar per week and individual conferences.</td>
</tr>
<tr>
<td>196W</td>
<td>Special Field Research.</td>
<td>10.5 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Course may be repeated for credit as topic varies. Two hours of seminar per week and individual conferences.</td>
</tr>
<tr>
<td>197</td>
<td>Field Study in Sociology.</td>
<td>4 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis.</td>
</tr>
<tr>
<td>198</td>
<td>Directed Group Study for Undergraduates.</td>
<td>1-3 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalogue. Credit and grade to be awarded on completion of course.</td>
</tr>
<tr>
<td>199</td>
<td>Supervised Independent Study and Research.</td>
<td>4 hours of lecture per week.</td>
<td>1 or 3 or 3AC or consent of instructor.</td>
<td>Supervised independent study relevant to specific aspects of sociology in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)</td>
</tr>
</tbody>
</table>
| 200    | Proseminar. | 1 hour of lecture per week. | 1 or 3 or 3AC or consent of instructor. | Must be taken on a satisfactory/unsatisfactory basis. This seminar is required of all first-year graduate students and is supervised by a regular faculty member. The seminar familiarizes students with faculty scholarship and research.
and their various research interests and of opportunities available for funding via research and teaching assistantships. It consists of presentations by faculty on their past, present and future research and by representatives of Organized Research Units on their mission, programs of research, and opportunities for assistantships.

201. Sociological Theory. (4) Four hours of lecture per week. Prerequisites: Consent of instructor. Representatives of major theoretical traditions in sociology will be examined historically and critically. An effort will be made to identify the recurrent substantive and methodological issues that arise in sociological theorizing. This is the required M.A. theory course.

202. Advanced Study in Sociology Course. Course may be repeated for credit. Two hours of seminar per week. Particular theorists or theoretical traditions will be selected for intensive study, according to the interests of the instructor. Graduate students must take at least one 202 before taking the qualifying examination.

202A. Classical Sociological Theory. (3)
202B. Contemporary Sociological Theory. (3)
202C. Systematic Sociological Theory. (3)

205. Supervised Preparatory Course Work. 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)
205F. Family and Life Cycle. (3)
205H. Development and Modernization. (3)
205I. Religion. (3)
205J. Urban Sociology. (3)
205L. Gender. (3)
205M. Culture. (3)
205U. Society and Environment. (3)
205V. Society and Technology. (3)

271A-271C. Methods of Sociological Research. (4-3-3:3) 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 field work, historical and comparative inquiry, experimental research, and survey analysis. The first semester concentrates on techniques for gathering evidence; the second and third semesters focus on beginning and intermediate numerical techniques for analyzing evidence.

C271D. 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. Logic of Inquiry. (3)
272B. Survey Research. (3)
272C. Comparative and Historical Research. (3)
272D. Quantitative Statistical Research. (3)
272E. Participant Observation. (3)
272F. Interview Methods. (3)

273. Advanced Seminars in Research Methods. Course may be repeated for credit. Two hours of seminar per week. Seminar in advanced sociological research methods.

273C. Comparative/ Historical Research. (3)
273D. Quantitative/Statistical Research. (3)
273F. Interview Methods. (3)
273J. Feminist Methods. (3) Prerequisites: Consent of instructor.

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)
280B. Race and Ethnic Relations. (3)
280C. Political Sociology. (3)
280D. Organizations. (3)
280E. Industrial Sociology. (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)
280U. Environment and Society. (3)
280V. Sociology of the Information Society. (3)

285. Dissertation Seminar. (3) Course may be repeated for credit. Three hours of lecture per week. Must be taken on a passed/not passed 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; 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 for professional writing for sociologists. We will focus on editing, rewriting, re-editing, and re-writing 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 world 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. Fischer

290. 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.

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. For students engaged in individual research and study. May not be substituted for available graduate lecture courses or 290. (F,SP)

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. Prerequisites: Consent of instructor. Individual study for the master’s requirements in consultation with the adviser. Units may not be used to meet either unit or residency requirements for the master’s degree. (F,SP)

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 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 residency requirements for the doctoral degree. (F,SP)

Professional Courses

301. Professional Training: Teachers. (3-6) Course may be repeated for credit. Units may not be used to meet unit or residence requirements for either the master’s or doctoral degree. Must be taken on a satisfactory/unsatisfactory basis.

401. Professional Training: Research. (3-6) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Units may not be used to meet unit or residence requirements for either the master’s or doctoral degree.
South and Southeast Asian Studies

(College of Letters and Science)

Department Office: 7233 Dwinelle Hall, (510) 642-4564
E-mail: seas-studies@berkeley.edu
Chair: Vasudha Dalmia, Ph.D.
Vice Chair: George Hart, Ph.D.

Professors
Lawrence Cohen, Ph.D. Harvard University. Medical and South and Southeast Asian art
Vasudha Dalmia, Ph.D. Jawaharlal Nehru University. Hindi language and literature
Robert P. Goldman, Ph.D. University of Pennsylvania. Sanskrit literature, Indian epics
George L. Hart III, Ph.D. Harvard University. Tamil language and literature
Roko Ray, Ph.D. University of Wisconsin. Feminist theory, social movements
Jogina Williams, Ph.D. Harvard University. Indian and Southeast Asian art
P.S. Jani (Emeritus), Ph.D. University of London. Buddhism, Jainism, Hinduism
J.F. Staal (Emeritus), Ph.D. University of Madras. Comparative philosophy, Sanskrit, ritual
Amin Sweeney (Emeritus), Ph.D. University of London. Malay/Indonesian language and literature, oral tradition

Associate Professors
Sylvia Twion, Ph.D. University of California. Modern Indonesian
Bruce R. Pray (Emeritus), Ph.D. University of Michigan. Hindi/Urdu language and literature
Barend A. van Nooten (Emeritus), Ph.D. University of California. Sanskrit, grammar, linguistics, paleography

Assistant Professors
Ashley Thompson, Ph.D. University of Chicago. Hindi and Urdu literature, Indian religions and cultural history, Sufism
Jeffrey Hadler, Ph.D. Cornell University. Southeast Asian art

Senior Lecturer
Usha R. Jain, M.A. University of California. Hindi language

Lecturers
Sally J. Sutherland Goldman, Ph.D. University of California, Berkeley. Sanskrit language, Indian mythology
Ima Petia Goswale, M.A. University of Hawaii. Manipuri, Tagalog language
Kausalya Hart, M.A. Annamalai University. Tamil language and literature
Susan F. Kepner, Ph.D. University of California, Berkeley. Tagalog language and literature
Nink Lunde, M.A. University of Wisconsin. Indonesian language
Upkar K. Ubbi, B.A. Hons., University of London. Punjabi language, linguistics, and literature

Graduate Adviser: Ms. Twion.

Undergraduate Adviser: Ms. Williams.

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 performances, dance, 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, ethnic/racial theory, historiography, and cultural studies. Appropriate comparative work on Asian and non-Asian cultures is encouraged as well.

The Major

The major is a flexible, interdisciplinary program offering opportunities for both wide, comparative study of South and Southeast Asian cultures and greater concentration on a particular area of interest. With the guidance of the faculty under-graduate adviser, students might choose, for example, to pursue intense study of a language and its literature or broader inquiries into such subjects as the religions of traditional and modern South and Southeast Asia. Students may include in their major programs suitable courses from other departments.

The major consists of 42 units (normally between 10 and 12 courses). To declare the major, students must complete the following:

A. one lower division sequence on either the civilization of South Asia (SA 5A, 5B) or the civilization of Southeast Asia (SEA 10A, 10B), and

B. two semesters of introductory language work in one of the following languages: Hindi-Urdu, Khmer, Malay/Indonesian, Punjabi, Sanskrit, Tagalog, Tamil, Thai, and Vietnamese. Students may establish first-year language proficiency through examinations administered by the department (although passing an examination will not carry credit).

C. Students must also complete a minimum of 24 units in upper division courses concerning South and Southeast Asia, at least half of which must be taken in the department. The faculty undergraduate adviser must approve all courses taken outside the department that students intend to use for credit toward the major. Among their upper division courses, students normally will be expected to include one seminar (SSEAS 190 or an equivalent) that requires significant research and writing in South or Southeast Asia

Students are strongly encouraged to continue language study beyond the first-year level and to organize programs, in consultation with the undergraduate adviser, of clear thematic and geographical focus.

The Minor

The minimum requirements, set by the College of Letters and Science, for the completion of a minor program are five upper division courses, of which a minimum of three must be completed at Berkeley. All courses in a minor program must be completed on a letter-graded basis. An overall grade-point average of 2.0 is required in courses used for the minor program.

Seven-Course Breadth Courses

Arts & Literature. SA 121, 122, 124, 128, 129, 131, 138, 140, 142, 143, 145, 165; SSEAS 138; SEASIAN 123, 124, 128

Historical Studies. SEASIAN 10A, 10B

International Studies. SEASIAN 10A, 10B; HINDURD 101A

Philosophy & Values. SA 122, 127, 128, 131, 140, 141, 155, 160, 165

Social & Behavioral Sciences. SA 108, 110A, 110B, 130, 139, 141, 145; SEASIAN 122, 130

Honor Program

To be eligible for admission to the honors program, students must attain a 3.5 grade-point average or higher in courses completed in the major, and a 3.3 grade-point average in all courses completed in their undergraduate work. To be ready for the Ph.D. degree, students must complete the following:

A. an honors thesis is required. Students in the joint M.A./Ph.D. program will acquire the M.A. degree upon completion of 20 units of course work 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 students holding the M.A. who have not completed equivalent work); and competence in one or more appropriate secondary languages.

B. 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 Index for Graduate Education). The Sanskrit emphasis also requires completion of a written competency examination in Sanskrit literature, religious studies, and cultural studies.

C. Students in the joint M.A./Ph.D. program will acquire the M.A. degree upon completion of 20 units of course work in graduate status at Berkeley (including at least four graduate seminars in the language of emphasis and the methods seminar); demonstration of advanced competence in the language of emphasis; demonstration of historical knowledge; advancement to M.A. candidacy; and completion of the dissertation. They will also acquire the Ph.D. degree upon completion of the remaining 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, under the University’s Plan I (see Graduate Education).

The M.A. thesis in South and Southeast studies is expected to run between 25 and 50 double-spaced, typewritten pages, excluding 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 examination (which should be taken in the seventh or eighth semester). Students may enroll in courses beyond the 10-course minimum and may audit courses with the permission of instructors. Students may use a limited number of lower division courses.

The M.A./Ph.D. Program

This program offers emphases in the following languages and literatures: Hindi, Malay/Indonesian, Sanskrit, Tamil, and Burmese. This program is intended 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. Advanced proficiency in the language of emphasis is a central goal of study, as is the ability to undertake sophisticated textual study of a broad range of literary works in that language. The Ph.D. in South and Southeast Asian studies prepares students for academic careers in teaching and research not only in South and Southeast Asian studies, but also in comparative literature, religious studies, Asian studies, and cultural studies.

Prerequisites. The prerequisites for admission to the M.A./Ph.D. Program are two years of study in the language of emphasis or the equivalent, and eight undergraduate or graduate course dealing 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 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 Index for Graduate Education). The Sanskrit emphasis also requires completion of a written competency examination in Sanskrit literature, religious studies, and cultural studies.

Students in the joint M.A./Ph.D. program will acquire the M.A. degree upon completion of 20 units of course work in graduate status at Berkeley (including at least four graduate seminars in the language of emphasis and the methods seminar); demonstration of advanced competence in the language of emphasis; demonstration of historical knowledge; advancement to M.A. candidacy; and completion of the dissertation. They will also acquire the Ph.D. degree upon completion of the remaining 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, under the University’s Plan I (see Graduate Education).

The M.A. thesis in South and Southeast studies is expected to run between 25 and 50 double-spaced, typewritten pages, excluding 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.

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*Professor of the Graduate School
*Recipient of Distinguished Teaching Award

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South and Southeast Asian

Lower Division Courses

RSA. Self, Representation, and Nation. (4) Three hours of lecture and one hour of discussion per week. Formerly 5A. We will draw from a wide range of readings taken from South and Southeast Asian colonial and national figures. We will focus mainly on the history of the role of the colonial state and the birth of the nation in India, Pakistan, and the Malay world. Colonial figures such as Sir Thomas Stamford Raffles, James Mill, and Sylvia Brooke will provide us with insights into the colonial perspectives on these regions from the early 1800s to the Second World War. Translations of the writings of South and Southeast Asian figures such as R. A. Kartini, Gandhi, Nehru, Sukarno, Benazir Bhutto, and Pramoedya Ananta Toer will allow us to immerse ourselves in the awakenings prior and immediately after the birth of the Indian, Pakistani, Malaysian, Singaporean, and Indonesian nations. In addition, we will read critical and theoretical essays analyzing the role of autobiography and its capacity for representation of these figures with regard to their selves, their peoples, and their nations. This course satisfies the first part of the Reading and Composition requirement. (F,SP) Sparse

RSB. Under Western Eyes. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 5A or course equivalent to 1A. Formerly 5B. In this course, the student will read selections from the large body of scholarly texts that have been written about South Asia. Expository and argumentative essays by premier scholars such as Sir Thomas Stamford Raffles, Margaret Mead, Clifford Geertz, and Benedict Anderson will be examined. Discussions will cover a broad range of theoretical issues including power, gender, and space. This course satisfies the second half of the Reading and Composition requirement. (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 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 from semester to semester. Enrollment limited to 15 freshmen. (F,SP)

39. Freshman/Sophomore Seminar. 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. Freshman and sophomore seminars are designed to provide 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)

50. Special Topics in South and Southeast Asian Culture. (3) Course may be repeated for credit. Three hours of lecture per week. Current topics in method and theory of South and Southeast Asian culture, varying with instructor. (F,SP)

C51. Introduction to Religious Studies. (4) Three hours of lecture per week. Selected introductory topics in the study of religion. Also listed as Religious Studies C60B. (SP)

98. Directed Group Study for Lower Division Students. Course may be repeated for credit. Must be taken on a pass/No pass basis. Four-unit limit per term. Consent of instructor. Four-unit limit per term. (F,SP) Staff

98A. South Asian Studies. (1-4)
98B. Southeast 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 pass/No pass basis. Prerequisites: Consent of instructor. Four-unit limit per term. (F,SP) Staff

99A. South Asian Studies. (1-4)
99B. Southeast Asian Studies. (1-4)

Upper Division Courses

C110. Painting of India and Pakistan, 1100-1900. (4) Three hours of lecture and one hour of discussion per week. The class will follow the development and interaction of Islamic and Jain/Buddhist/Hindu book illustration under the patronage primarily of Mughal and Rajput courts. Indigenous aesthetic systems and the role of individual painters will be considered. Also listed as History of Art C136C. (F,SP)

C112. The British Empire and Commonwealth. (4) Three hours of lecture and one hour of discussion per week. This course analyzes the expansion, consolidation, functioning, and eventual disintegration of the modern British Empire (from 1783). We will examine not only the development of British attitudes and policies toward empire, but such larger issues as the creation of distinctive colonial cultures, and the role empire played in the growth of Britain's economy. We will also assess the ways the major colonial territories were affected by British rule. Also listed as History C153. (F,SP)

C113. Music of India. (4) Three hours of lecture and one hour of laboratory per week. Includes the classical music traditions of North and South India (Hindustani and Karnatak music). Also listed as Music C131A. (F,SP)

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 visitors to explore special 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)

190. Seminar in South and Southeast Asian Studies. (3) Course may be repeated for credit as topic varies. Two hours of seminar per week. Designed primarily to give majors sustained and intensive training in reading, writing, and analysis in the discipline. Independent research and a substance essay basis. Topics will vary in accord with faculty and student interests. (F,SP)

H195A. South Asian Studies. (3) (F,SP)

198. Directed Group Study for Upper Division Students. Course may be repeated for credit. Must be taken on a pass/No pass basis. Tutorial instruction in areas not covered by regularly scheduled courses. Four-unit limit per term.

198A. South Asian Studies. (1-4) (F,SP)
198B. Tamil. (1-4) (F,SP)
198C. Hindi-Urdu. (1-4) (F,SP)
198D. Malay/Indonesian. (1-4) (F,SP)
198E. Southeast Asian Studies. (1-4) (F,SP)
198F. Sanskrit. (1-4) (F,SP)

199. Supervised Independent Study and Research. Course may be repeated for credit. Must be taken on a pass/No pass basis. Four-unit limit per term. (F,SP)

199A. South Asian Studies. (1-4) (F,SP)
199B. Tamil. (1-4) (F,SP)
199C. Hindi-Urdu. (1-4) (F,SP)
199D. Malay/Indonesian. (1-4) (F,SP)
199E. Southeast Asian Studies. (1-4) (F,SP)
199F. Sanskrit. (1-4) (F,SP)
Graduate Courses

200A-200B. Readings in South Asian Islam. (4-4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. This seminar will offer an opportunity to study the discourses and institutional arrangements engaging Islam and Muslims on the Indian subcontinent and in the colonial state, while simultaneously investigating a range of Muslim thinkers and social movements for which Islam was a significant category. Having reviewed the institutional and institutional changes of the colonial period, we shall go on to examine the transformations that set in with Partition and the establishment of independent states. The goal of this course is both to introduce students to major secondary works in the field of modern Indo-Muslim studies, including history, anthropology, and literary criticism; and to probe a selection of primary sources, among them government documents, treatises, polemical literature, travel accounts, material representations in art and architecture, as well as imaginative texts including fiction, poetry, and film. By making comparisons to similar issues among non-Muslims, we shall try to understand the extent and source of different patterns of change. The course may be repeated for credit if it is taught with a greater focus on the medieval period. (F,SP)

250. Seminar in South and Southeast Asian Studies. (4) Three hours of seminar and one hour of discussion per week. Prerequisites: Consent of instructor. Formerly South Asian 250. Topics vary from semester to semester. Staff.

290. Special Studies. Course may be repeated for credit. Students may enroll in more than one section of 290 in any one semester as long as the number of units of Special Study in any one semester may not exceed 12. (F,SP)

290A. South Asian Studies. (1-5) (F,SP)

290B. Tamil. (1-5) (F,SP)

290C. Hindi-Urdu. (1-5) (F,SP)

290D. Malay-Indonesian. (1-5) (F,SP)

290E. Southeast Asian Studies. (1-5) (F,SP)

290F. Sanskrit. (1-5) (F,SP)

294. Department Colloquium in South and Southeast Asian Studies. (3) Two hours of seminar per week. Preparation and discussion of research papers in the area of South or Southeast Asian Studies. Topics are chosen each year in consultation with faculty and students. Papers are presented at weekly meetings during the spring semester. (SP) Staff.

299. Dissertation Preparation and Related Research. Course may be repeated for credit. Must be taken in a semester of 6 units of Special Study in any one semester. Staff.

300. Methods and Problems in Teaching South and Southeast Asian Studies. (3) 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: For candidates for doctoral degree. 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.

602A, South Asian Studies. (1-8) (F,SP)

602B. Tamil. (1-8) (F,SP)

602C. Hindi-Urdu. (1-8) (F,SP)

602D. Malay-Indonesian. (1-8) (F,SP)

602E. Southeast Asian Studies. (1-8) (F,SP)

602F. Sanskrit. (1-8) (F,SP)

South Asian

Lower Division Courses

1A. Introduction to the Civilization of India. (4) Three hours of lecture and one hour of discussion per week. Readings, lectures, and discussions in the culture and civilization of India from the Indus Valley and Brahmanic civilization to the advent of Islam. Special emphasis on the development of early religious, philosophical, and aesthetic systems of traditional India. (F)

1B. Introduction to the Civilization of India. (4) Three hours of lecture and one hour of discussion per week. Readings, lectures, and discussions in the development of Indian culture from the advent of Islam to the present. Special emphasis on the role of the medieval religious movements of Bhakti and Islamic India and the impact of traditional and modern values in contemporary India. (SP) Staff.

R5A. Great Books of India. (4) Three hours of lecture and one hour of discussion per week. Formerly 54. 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,SP) Staff.

R5B. India in the Writer's Eye. (4) Three hours of lecture and one hour of discussion per week. Formerly 58. Reading and composition in connection with eastern and western representations of India, and other modern Indian culture, in the context of modern literature. Satisfies the second half of the reading and composition requirement. (SP) Staff.

Upper Division Courses

106. Psychology and Traditional India. (3) Three hours of lecture per week. Prerequisites: Psychology 1A, Psychology 1, or permission of instructor. Lectures and discussion of psychological and psychoanalytic approaches to some of the characteristic cultural and social aspects of ancient and traditional India. Readings in translation and important secondary works on the psychology of Indian culture, and selected works from the psychoanalytic literature. (SP) R.P. Goldman

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 and original works in English. Interpretation of Indian society and culture through literature. Staff.

C127. 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 teaching it by separate religious traditions facilitates comparisons and promotes an understanding not only of the differences among these religions but also some of their commonalities in philosophy, theology, and praxis. Also listed as Religious Studies C161. Staff.

C128. Religious Identities in South Asia. (4) Three hours of lecture per week. Prerequisites: 127 or Religious Studies 161 or consent of instructor. Formerly Hindi 135. Special emphasis on the making of religious and ethnic identities in India after the coming of Islam to the subcontinent. Topics covered include the formation of Sufi shrines in India, Krishna bhakti and the Vaishnava sects, Kabir, Nanak, Taladhas Ramacharitmanas, and the Ramila performance tradition, women's religion, Islamic and Hindu reform movements in colonial India, and the intersection of modern nationalisms and religious identity. Also listed as Religious Studies C163. Staff.

129. Indian Mystical Traditions and Practices. (4) Three hours of lecture and one hour of discussion per week. Reading and discussion of the main traditions of mystical thought and practice, both Hindu and Moslem. (F,SP) Staff.

138. Theatre in India. (4) Three hours of lecture per week. Prerequisites: Any South Asian course or consent of instructor. This course provides a survey of Indian theatre including changes and developments in the field brought about by dramatic traditions from ancient Sanskrit drama to contemporary drama, including street theatre by politically motivated groups. Readings of plays and modern and folk theatre will be supplemented with essays in the history and theory of theatre as genre and spectacle. Staff.

C140. Hindu Mythology. (3) Three hours of lecture per week. Formerly 140. Literary and religious aspects of Hindu myths. Reading of selected mythological texts in translation. Also listed as Religious Studies C165. Goldman.

141. Religion in South India. (4) Three hours of lecture and one hour of discussion per week. The development and practice of religion in South India. Emphasis will be on sources translated directly from the Indian languages. Subjects covered include: the indigenous religion, the east of Brahmanical religion, the practice of Brahmanical religion, the practice of Hinduism in modern South India. Staff.

C141. Religion in South India. (3) Three hours of lecture per week. Formerly 141. The development and practice of religion in South India. Emphasis will be on sources translated directly from Indian languages. Subjects covered include: the religious diversity, the practice of Brahmanical religion, the practice of Hinduism in modern South India. Also listed as Religious Studies C162. Staff.

C142. India's Great Epics: The Mahabharata and the Ramayana. (4) Three hours of lecture per week. Prerequisites: 54, 127, 140, or consent of instructor. This course explores the substantial texts from a range of perspectives.
143. Indian Romances. (3) Three hours of lecture per week. The literary tradition of the romance in South Asia, focusing on Indian narratives of love in different social contexts, and the fantasies surrounding romantic love. Readings include Kalidas’s Sakuntala, love stories from Islamic India, 19th-century proce, romances, and several Hindi films. (F,SP) Behl

145. Dance and Dance-Drama of India. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1A-1B or consent of instructor. An introduction to the diverse styles of Indian dance and their role in Indian cultural history. Lectures of the history and development of Indian dance and dance-drama and their importance in traditional, as well as modern, Indian society. The elements of dance, vocal and instrumental music, poetic and prose texts, mime, dialogue, costumes, make-up, and masks will be compared in major forms. Readings will be drawn from an extensive body of scholarship on the principal styles of dance. Students will have the opportunity to learn some of the musical rhythms and dance movements.

155. Philosophies of India. (4) Three hours of lecture and one hour of discussion per week. The philosophies of India, Hindu and Buddhist, beginning with the Vedic period and concentrating on the classical systems. Staff

Graduate Courses

210. Panini and the Indian Linguistic Tradition. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: Some familiarity with linguistic and/or the elements of an Indian language or consent of instructor. The linguistic description and analysis of Sanskrit as created and developed by the Sanskrit grammarians. (F,SP) Staff

212. Indian Philosophical Texts. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: Some knowledge of Sanskrit texts on Indian philosophy (e.g. Vedanta, Mimansa, Yoga, Nyaya). Staff

215A-215B. Readings in Indian Buddhist Texts. (4-4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: 215A is prerequisite to 215B. One year of Sanskrit and/or consent of instructor. A survey of the origins and development of the Abhidharma texts and commentaries in Pali and Sanskrit. (F,SP) Staff

Southwest Asian

Upper Division Courses

122. Orality and Literacy in Insular Southeast Asia. (4) Three hours of lecture and one hour of discussion per week. This course examines the ways knowledge is organized in societies of insular Southeast Asia. It explores the shaping, communicating, storing, and retrieving of knowledge, beginning with oral tradition, progressing through manuscript and print culture into this electronic age. (F)

124. The Shadow-Play in Southeast Asia. (4) Three hours of lecture and one hour of discussion per week. Introduction to study of Southeast Asian shadow-plays (Indonesia, Malaysia, Thailand, Cambodia) with special reference to Malay genres. Course will deal with origins, history and development, cultural context, transmission, language and style of performance, repertoire, and ritual. Students will also learn rudiments of performing. (SP)

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. Genres discussed will include poetry, the novel, the short story, and drama. Staff

129. Mainland Southeast Asian Literature. (4) Three hours of lecture per week. Prerequisites: One division standing or consent of instructor. The study of the short story, and drama. Genres discussed will include poetry, the novel, the short story, film, and television in their cultural/historical context. (SP)

130. Articulations of the Female in Indonesia. (4) Three hours of lecture per week. Course examines the history of the impact 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

Graduate Courses

C291A. Oral Performance: Noetica and Poetics. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly 291A. This seminar will explore how oral performance traditions organize and manage knowledge. Emphasis will be placed upon the totality of the performance, with a focus upon music as a codeterminant of the meaning and a catalyst for composing the text. Also listed as Rhetoric C291A and Music C291A. Staff

Hindi-Urdu

Lower Division Courses

1A-1B. Introductory Hindi and Urdu. (5-5) Five hours of lecture and one hour of laboratory per week. Survey of grammar, graded exercises, and readings drawn from Hindi texts, leading to mastery of basic language patterns, essential vocabulary, and to achievement of basic reading and writing competence. (F,SP) Lunde

100A-100B. Intermediate Hindi and Urdu. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: Two years of Hindi or consent of instructor. This course introduces students to a variety of contemporary literary styles. Readings include discussions of short stories, poems, and dramatic sketches from representative authors. Short written assignments on themes suggested by the readings required. Special attention to matters of vocabulary and syntax. (F)

200-300. Modern Hindi and Urdu. (3-3) Three hours of lecture per week. Prerequisites: Two years of Hindi or consent of instructor. This course introduces students to a variety of contemporary literary styles. Readings include discussions of short stories, poems, and dramatic sketches from representative authors. Short written assignments on themes suggested by the readings required. Special attention to matters of vocabulary and syntax. (F,SP) Lunde

Upper Division Courses

210A-210B. Seminar in Hindi and Urdu. (2) Three hours of lecture and one hour of discussion per week. This seminar brings together students, instructors, and guests to explore contemporary Indian writing in English. (F,SP) Staff

215. Philosophies of India. (4) Three hours of lecture

221. 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 fiction, drama and critical essays, occasionally also on the medieval devotional literature in Hindi. Topics and works will vary from year to year. Students will be expected to write a 20-25 page research paper. Dalmia

225. Urdu Literature. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture and one hour of discussion per week. Prerequisites: At least two years of Hindi and/or Urdu and a knowledge of the Urdu script. Formerly 210. Topics and works will vary from year to year depending on student and faculty interest. Readings will be drawn from the 19th and 20th century; Pakistani and Indian poetry and prose. Post-partition literature of both India and Pakistan will be amply treated. Skill in reading and evaluating Urdu literary criticism is another goal. (F,SP) Staff

Malay/Indonesian

Lower Division Courses

1A-1B. Introductory Indonesian. (5-5) Five hours of lecture and one hour of laboratory per week. Survey of grammar, graded exercises, and readings drawn from Indonesian texts, leading to 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

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 grammar, graded exercises and readings drawn from Indonesian texts, leading to mastery of grammatical structures and essential vocabulary and achievement of basic reading and writing competence. (F,SP) Lunde

Graduate Courses

210A-210B. Seminar in Malay and Indonesian. (4-4) Course may be repeated for credit with consent of instructor. Three hours of lecture and one hour of discussion per week. Various aspects of Malay language and literature, history and development of the language, classical literature, drama, oral literature, modern literature of Indonesia and Malaysia, and selected studies. Applies various theoretical approaches to the study of the language and literature. (F,SP) Staff

232. Readings in Modern Indonesian and Malaysian Literature. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Two years of Malay/Indonesian or consent of instructor.
For Formerly 132. This course will focus on the 20th century literatures of Indonesia and Malaysia. Emphasis will be on the socio-cultural matrix of such modern genres as the novel, the short story, and poetry. Lectures and most course work in Indonesian. (SP) Staff 234. Readings in the Traditional Literature of the Malay World. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: Two years of Malay/Indonesian or consent of instructor; Formerly 134. This course serves two functions: it provides a survey of traditional Malay literature, involving study of texts from various periods and styles. It also offers advanced language instruction; Indonesian will be used in some lectures and in students' papers. (F) Staff

Punjabi

Lower Division Courses

1A-1B. Introductory Punjabi. (5-5) Five hours of lecture and one hour of laboratory per week. An introduction to modern Punjabi as spoken in India and Pakistan, emphasizing the development of communicative competence in speaking, oral comprehension, reading, and writing. Readings and teaching material will be drawn from Punjabi short fiction, poetry, films, and current magazines and newspapers. Audiocassettes of Punjabi popular and folk songs, as well as videocassettes of Punjabi films, will complement print materials. (F,SP) Staff

100A. Introductory Punjabi. (5-5) Five hours of lecture and one hour of laboratory per week. Prerequisites: 1A-1B or consent of instructor. Representative readings in Punjabi literature and expository prose, exploring a variety of literary forms and styles. Systematic study of grammatical/lexical problems arising from these readings. Advanced composition exercises. (F,SP) Staff

Upper Division Courses

100A-100B. Intermediate Punjabi. (5-5) Five hours of lecture and one hour of discussion per week. Prerequisites: 1A-1B or consent of instructor; 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

100A-100B. Intermediate Punjabi. (5-5) Five hours of lecture and one to two hours of discussion per week. Prerequisites: 1A-1B, or consent of instructor; Formerly Tagalog 1B. 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

Upper Division Courses

100A-100B. Intermediate Punjabi. (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

Graduate Courses

200A-200B. Tamil 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 201, 201 and 202. Advanced readings in Sanskrit literature, including Sanskrit omate poetry with emphasis on the canons of poetic analysis of the Indian aesthetic tradition. (F,SP) R.P. Goldman

Vedic Sanskrit. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: 101B or equivalent. Formerly 201, 201 and 202. Advanced readings in Sanskrit literature, including Sanskrit omate poetry with emphasis on the canons of poetic analysis of the Indian aesthetic tradition. (F,SP) R.P. Goldman

Middle Indic. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: 101B or equivalent. Introduction to Middle Indic. An intensive study of texts in one or more of the Prakrit dialects, Pali, or Apabhramsa. (F,SP) 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. (F) Staff

208. Buddhist Sanskrit. (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. Readings in the literature of North Indian Buddhism with emphasis on the grammatical features that distinguish it from classical Sanskrit and Pali. (F,SP) 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-1B, or consent of instructor. Formerly Tagalog 1B. 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; Formerly Tagalog 1B. 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

100A. Advanced Vietnamese. (3) Three hours of lecture per week. Prerequisites: 100A-B or equivalent. Formerly Vietnamese 101A. This class is designed for students who have already achieved an intermediate degree of proficiency in speaking, reading and modern Vietnamese. Its objective is to move students towards a greater level of fluency in each of these key areas. The course also seeks to further an understanding of Vietnamese society, culture, and history as well as aspects of cross-cultural communication more generally. Students who successfully complete the course should be able to converse at a high level on a wide range of subjects, read newspapers, academic writings, and short fiction; write a business letter and conduct interviews for scholarly or journalistic research all in Vietnamese. In addition to weekly readings from Kenneth Quinn’s Advanced Vietnamese (Rhaca: Cornell University SEAP, 1991) assignments will be drawn from contemporary literature, newspaper and magazine articles, technical manuals and academic texts. Some attention will be given to poetry and verse narrative in addition to primary emphasis on modern prose. Narrative and documentary films, television news broadcasts, and song lyrics will be used to enhance listening comprehension. To improve students’ grasp of grammar, syntax (F,SP) Dalmia

101B. Advanced Vietnamese. (3) Three hours of lecture per week. Prerequisites: 100A-100B or equivalent. Formerly Vietnamese 101B. For students who have completed Vietnamese 101A or the equivalent. A continuation of 101A, with the goal of conversational fluency, advanced reading competence, and facility in writing. In addition to weekly readings from Kenneth Quinn’s Advanced Vietnamese (Rhaca: Cornell University SEAP, 1991) assignments will be drawn from contemporary literature, newspaper and magazine articles, technical manuals and academic texts. Some attention will be given to poetry and verse narrative in addition to a primary emphasis on modern prose. Narrative and documentary films, television news broadcasts, and song lyrics will be used to enhance listening comprehension. To improve students’ grasp of

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 or is a prerequisite for 1B. 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 the student 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; 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 simplified readings from contemporary Vietnamese writers. (F,SP) Staff

101A. Advanced Vietnamese. (3) Three hours of lecture per week. Prerequisites: 100A-B or equivalent. Formerly Vietnamese 101A. This class is designed for students who have already achieved an intermediate degree of proficiency in speaking, reading and modern Vietnamese. Its objective is to move students towards a greater level of fluency in each of these key areas. The course also seeks to further an understanding of Vietnamese society, culture, and history as well as aspects of cross-cultural communication more generally. Students who successfully complete the course should be able to converse at a high level on a wide range of subjects, read newspapers, academic writings, and short fiction; write a business letter and conduct interviews for scholarly or journalistic research all in Vietnamese. In addition to weekly readings from Kenneth Quinn’s Advanced Vietnamese (Rhaca: Cornell University SEAP, 1991) assignments will be drawn from contemporary literature, newspaper and magazine articles, technical manuals and academic texts. Some attention will be given to poetry and verse narrative in addition to primary emphasis on modern prose. Narrative and documentary films, television news broadcasts, and song lyrics will be used to enhance listening comprehension. To improve students’ grasp of grammar, syntax (F,SP) Dalmia

101B. Advanced Vietnamese. (3) Three hours of lecture per week. Prerequisites: 100A-100B or equivalent. Formerly Vietnamese 101B. For students who have completed Vietnamese 101A or the equivalent. A continuation of 101A, with the goal of conversational fluency, advanced reading competence, and facility in writing. In addition to weekly readings from Kenneth Quinn’s Advanced Vietnamese (Rhaca: Cornell University SEAP, 1991) assignments will be drawn from contemporary literature, newspaper and magazine articles, technical manuals and academic texts. Some attention will be given to poetry and verse narrative in addition to a primary emphasis on modern prose. Narrative and documentary films, television news broadcasts, and song lyrics will be used to enhance listening comprehension. To improve students’ grasp of

Formerly 100A-100B. Intermediate Thai. (5-5) Five hours of lecture per week. Prerequisites: Two years of Thai literature and expository prose, exploring a variety of literary forms and styles. Systematic study of grammatical and lexical problems arising from these readings. Advanced exercises in composition.

Thai

Lower Division Courses

1A-1B. Introductory Thai. (5-5) Five hours of lecture per week. Survey of grammar, graded exercises, readings drawn from Thai literature, leading to a mastery of basic grammatical patterns, essential vocabulary, and achievement of basic reading and writing competence. (F,SP)
Spanish and Portuguese
(College of Letters and Science)

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 languages and a critical understanding of the development and achievements of their literatures in the Old World and in the New, to training in advanced study and independent research. The department'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 Portuguese

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 department, including Spanish 102A and 102B or 102C; two courses in Spanish literature, one in Medieval or Golden Age and one in Modern; two courses in Spanish-American literature; one course in Spanish linguistics or theoretical approaches to literature; three upper division elective courses in Catalán, Portuguese, or Spanish (but excluding Catalán, Portuguese 101, Portuguese 101A-101B, Portuguese 102, and Spanish 142, 147, and 197). 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 Portuguese 101 and 102 (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 equivalents 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 department, including Portuguese 103; Portuguese 104 and one other course in Portuguese (one of 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 electives in Portuguese courses must be taken in the department, two of which may be in a related field of Spanish or Spanish-American literature, linguistics, or culture. In addition, students are required to complete two courses (upper or lower division) from outside the department, specifically 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 102B or 102C; Catalán 101 or Portuguese 101; one course from the literature of Portugal or Catalán; five other upper division courses in Spanish, Portuguese, or Catalán 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, specifically related to the major.

Plan 2: Latin American

Upper Division. A minimum of 10 upper division courses totaling at least 30 units in the department, including Spanish 102A and 102B or 102C; Portuguese 101; one course from the literature of Spanish America; one course from the literature of Brazil; five other courses in Spanish/Portuguese language or linguistics, or in Brazilian or Spanish-American literature 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, specifically related to the major.

If the student from previous training has the equivalent of Portuguese 101, Portuguese 102, or Catalán 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 10 upper division courses totaling at least 30 units, of which at least 21 upper division units must be in the department. Cross-listed courses count only once toward the major. Department courses must include the following distribution:

1. Core languages courses: Two courses from the 102 series (6 units).
2. Core linguistics courses: Spanish 100 (3 units); one course in Spanish linguistics that includes discussion 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 164, Dialectology, or equivalent, 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, Coexistence and Conflict: American, English, and Spanish in the Southwest (3 units).

Courses taken outside the department must be approved by the departmental major adviser before enrollment. In addition, these courses must have the following distribution (list offered as an example of possible course combinations; a more complete list is available from the department): 1) One upper division course dealing with bilingualism issues, such as Psychology 125 or Education 141 (3 units); 2) One upper division course in U.S. Hispanic literature/culture, such as Chicano Studies 150 or 170 or 172; 3) One course, lower or upper division, specifically related to the major. This course may be taken on a passed/not passed basis.

Honor's 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 grade-point average of at least 3.3 and a grade-point average of at least 3.6 in courses in the major. Students must also have the approval of the major adviser in consultation with other members of the department. Students admitted to the honors program must complete an honors thesis or project during the third semester of the senior year, seven core courses for either option A, B, C, or D or give evidence, by special examination, of equivalent preparation. Students passing an examination in lieu of any 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 the special honors courses H195A-H195B, which are offered each semester. These courses consist of independent study and the writing of a thesis over the course of two semesters under the direction of an appropriate member of the department.

The Minor

General Requirements: (1) Courses must be completed on a letter-grade basis; (2) A minimum GPA of 2.0 in the courses of the minor; (3) A minimum 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 major group; (5) A student may not major in Spanish and Portuguese 197 may not be offered in satisfaction of the elective portions of the minor programs.
The Minor in Spanish Language and Literatures

Prerequisites: Spanish 1, 2, 3, 4, and 25 (or their equivalents). Requirements: Five upper division courses in Spanish/Spanish American language, linguistics, literature, or culture, selected from the offerings of the department.

Minor in Luso-Brazilian Language and Literatures

Prerequisites: Portuguese 11 and 12 or 101 and 102 (or their equivalents). Requirements: Five upper division courses in Portuguese/Brazilian language, linguistics, literature, or culture, selected from the offerings of the department.

Procedures: No formal declaration of enrollment in the minor program is required. Upon completion of the program, however, students must file with the undergraduate assistant of the department the Petition for Confirmation of Minor Program Completed, validated by the departmental adviser for the minor program. Students interested in either program should, therefore, work closely with the departmental 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 Latin American Studies in the index.

Graduate Program

Preparation for Graduate Study

The M.A. degree program in Hispanic Languages and Literatures requires a reading knowledge of another foreign language pertinent to Hispanic scholarship; the Ph.D. degree program in Romance Languages and Literature requires a reading knowledge of Latin, French, and Italian, besides Spanish; and the Ph.D. degree program in Hispanic Languages and Literatures requires a reading knowledge of two foreign languages pertinent to the student’s specialization.

The M.A. Program

The Department of Spanish and Portuguese has two tracks within the M.A. program in Hispanic Languages and Literatures: (1) Spanish and Spanish-American Literatures, and (2) Luso-Brazilian Studies.

(1) The requirements for an M.A. degree in Hispanic Languages and Literatures, emphasis Spanish and Spanish-American literature, are an A.B. degree with studies in Spanish equivalent to the undergraduate major in Spanish (Option A) at Berkeley, for students who have completed an equivalent major in Portuguese; eight courses of postbaccalaureate work in the Department of Spanish and Portuguese at Berkeley, of which at least six must be in strictly graduate (200 series) courses, including one course in historical or descriptive linguistics; and the passing of a comprehensive written and oral examination. The examination covers all periods and genres of Spanish and Spanish-American literature as well as the linguistic structure of Spanish.

(2) The requirements for the emphasis in Luso-Brazilian studies are an A.B. degree in Portuguese, Spanish and Portuguese, or another field with demonstrable bearing on Luso-Brazilian studies. A working knowledge of Spanish is highly recommended. Admission to Plan I (course work and theses) requires permission of the graduate adviser for the student’s thesis proposals by their assigned advisory committee. A minimum of 21 units in course work is required, including 12 units (four courses) in graduate (200 series) courses in the Department of Spanish and Portuguese, one of which must be in linguistics/theory, and a minimum of three courses in Portuguese. For Plan II (course work and a comprehensive examination), a minimum of 24 units in course work with 12 units (four courses) in graduate (200 series) courses in the Department of Spanish and Portuguese, one of which must be in linguistics/theory, one graduate seminar in Spanish or Spanish-American literature or culture and a minimum of three courses in Portuguese; and the passing of a comprehensive written and oral examination covering the candidates’ programs as established by their assigned advisory committee.

The Ph.D. Programs

The Department of Spanish and Portuguese administers two doctoral programs.

I. The Program in Romance Languages and Literature (with emphasis in Spanish). 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 linguistics with expertise in Spanish. No specific courses are required, but students, in consultation with a graduate adviser, will lay out a program designed to prepare them for the qualifying examination preceding advancement to candidacy. As early as possible, they must demonstrate a reading knowledge of Latin, French, and Italian, besides Spanish; and a reading knowledge of one of these languages and, by either written examination or appropriate course work in the others. A reading knowledge of Latin is recommended. The precise nature of the qualifying examination will depend on the student’s specific choice of plan from among the three program options:

1. Plan I requires a detailed knowledge of Spanish and Spanish American literature and familiar with Romance philology, with emphasis on Spanish, as well as further knowledge of a second Romance literature as a collateral, and of prescribed masterpieces in the third.

2. Plan II requires a detailed knowledge of Spanish and Spanish-American literature and familiarity with Romance philology, with emphasis on Spanish, as well as further knowledge of one broad, integrated field (period, movement, or genre) in both Italian and French literature.

3. Plan III requires an in-depth knowledge of the structure and history (internal and external) of Spanish, and either the history or structure of French or Italian.

II. The Program in Hispanic Languages and Literatures. Prerequisites for admission are the following: (a) an A.B. degree with a major in Spanish equivalent to the undergraduate major at Berkeley (Option A) or, for Plan III, a corresponding major in Portuguese; (b) the completion of eight courses of postbaccalaureate work in Hispanic literature, linguistics, and/or philology, of which at least six must be in strictly graduate courses; (c) work at an advanced level in an appropriate collateral subject (literature or linguistics). For admission to the qualifying examination, the student’s record must show one graduate course in historical or descriptive Hispanic linguistics, one in literary or linguistic theory, and a reading knowledge of two foreign languages pertinent to the specialization. The student must also give evidence of a comprehensive knowledge of Spanish and Spanish American literature or a basic knowledge of Hispanic and general literatures. (The chair, in consultation with the student’s graduate adviser, will appoint a committee which, during the student’s program, will evaluate previous preparation and determine what additional courses and/or examinations, if any, will be required).

The qualifying examination will test the student’s knowledge of the five languages or cultures to be selected in consultation with the graduate adviser from among the following: medieval Hispanic literature, Spanish and Spanish American literature (16th-18th century), modern Spanish and Spanish American literature, Latin American (Spanish American and Luso-Brazilian) literatures of all periods, Luso-Brazilian literature, and Hispanic linguistics. The examination will also test the student's knowledge of selected collateral subjects pertinent to the main field.

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 native speakers. (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. Beginning Spanish for Graduate Students. Course may be repeated for credit. Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Preparation for the Graduate Reading Exam. Staff

4. 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 1-3, as well as further practice in composition. (F,SP) Staff

5. 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

6. Elementary Spanish for Hispanics. (5) Five hours of recitation and one and one-half hours of laboratory per week. Prerequisites: Consent of instructor. An elementary course designed for the Hispanic student with limited oral fluency and no formal training in the language. Structured to use the students’ familiarity with the pronunciation of Spanish to develop a communicative ability and to impart a knowledge of the structure of the language equivalent to Spanish 1 and 2. (F,SP) Staff

7. Spoken Spanish. (3) Three hours of lecture per week. Prerequisites: 3 or equivalent. 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. Not for native or near-native speakers. Enrollmment limited: 16 students per section. (F,SP) Staff

8. 21. Spanish for Bilingual Students, First Course. (3) Three hours of lecture and one hour of laboratory per week. Prerequisites: Consent of instructor. Formerly 71. 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 71. An intermediate course for students whose native language is Spanish. (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 pass/​no pass basis. The Berkeley 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. Berkeley 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.

26. Advanced Spoken Spanish. (3) Three hours of lecture/discussion per week. Prerequisites: 8, 4, or equivalent. Course designed to increase communicational skills (speaking ability and listening comprehension) as well as to improve vocabulary control and awareness of grammatical structure at a level beyond that of Spanish 8. Some reading/laboratory work required. No-native speakers. Enrollment limit: 16 students per section. (F,SP) Staff.

30. 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.

96. 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 pass/not pass basis. Prerequisites: Consent of instructor. Group study of a topic not included in the regular department curriculum. Topics may be initiated by students 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.

102A. Advanced Grammar and Composition. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. (F,SP)

102B. Advanced Grammar and Composition. (3) Students will not receive credit for 102B after taking 102C. However, 102C cannot be removed by completing 102B. Three hours of lecture per week. Prerequisites: 25 or equivalent. (F,SP)

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 seminar with an emphasis on short stories. It will have three main components: a) writing of short stories outside of class; b) short and varied creative writing exercises, done both in and out of class; c) reading and discussion of original 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. Beginnings to 1700. (F)

107B. Survey of Spanish Literature. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. 1700 to the present. (SP)

108. Spanish Ballads. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. Introduction to Spanish Balladry, with emphasis on origins and development through the sixteenth century.

109. Spanish Drama of the 16th and 17th Centuries. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. Analysis and discussion of selected works by Cervantes, including his dramatic output.

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.

113. Studies in Latin American Culture. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. An overview of the culture of Spanish America, through emphasis on selected topics.

114. The Contemporary Spanish American Novel. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent.

115. Lyric Poetry of the Golden Age. (3) Three hours of lecture/discussion per week. Prerequisites: 25, 8, or equivalent. Brief overview of the major lyric poets of the Golden Age, among them Francisco de Quevedo and Juan de la Encina, through the first wave of Italian influence (Boscan, Garcilaso), the lyric poets (San Juan, Fray Luis), the second Ilaliane poets (Hernera), and the great poets of the Baroque (Gongora, Quevedo, Lope de Vega).

123A-123B. Modern Spanish Prose Fiction. (3,3) Three hours of lecture per week. Prerequisites: 25 or equivalent.

126. Medieval Spanish Literature. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent.

127. Eighteenth-Century Spanish Literature. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent.

128. Contemporary Spanish Literature. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. Developments in Spain's literature since 1939.

130. Twentieth-Century Spanish American Poetry. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent.

131. The Spanish American Short Story. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 25 or equivalent. The range of forms which this tradition assumes forces consideration of the different social circumstances in which they have evolved. The course thus addresses the issues of ethnicity, culture, race, and gender, in a diverse utilization of oral traditions. Also listed as Portuguese 134AC. This course satisfies the American cultures requirement. (F,SP)

161. Spanish Phonetics and Phonology. (3) Three hours of lecture/discussion per week. Prerequisites: 25 or equivalent. A study of the sound system of Spanish, with training in phonetic transcription and laboratory exercises. Introduction to structural and generative phonological analysis.

162. The Structure of Spanish. (3) Three hours of lecture per week. Prerequisites: 25 or its equivalent. Spanish 100 is recommended. An overview of issues involved in the presence of different languages in the same community, such as bilingualism, multilingualism, language conflict, language and identity, language choice, and language shift and gender. Illustrated by case studies from relevant regions, including the United States. Particularly recommended for Option D majors (Hispanic Languages and Bilingual Issues).

164. Spanish Dialectology. (3) Three hours of lecture/discussion per week. Prerequisites: 25 or equivalent. Introduction to geographical and social variation in the Spanish-speaking world.

165AC. Coexistence and Conflict: Amerindian, English, and Spanish in the Southwest. (3) Three hours of lecture per week. Prerequisites: 25 or its equivalent. Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: Restricted to majors in Spanish with 90 units of university work, including 15 upper division units in Spanish or Spanish American literature.

H195. Spanish Honors Course. (3) Individual conferences. Prerequisites: 25 or equivalent. Senior honors standing. Limited to senior honors candidates. Directed study centering on the preparation/completion of an honors thesis (see Honors Program, Option A, above).

H195A. Spanish Honors Course. (1.5) Individual conferences. Prerequisites: Spanish and Portuguese major; 3.6 GPA in the major; 3.3 GPA overall. This is a two-semester course. H195A will be graded at the end of the first semester, which will indicate that students are making progress on developing the thesis. During the second semester, each student will enroll in H195B and write an honors thesis.

H195B. Spanish Honors Course. (1.5) Individual conferences. Prerequisites: Spanish and Portuguese major; 3.6 GPA in the major; 3.3 GPA overall. This is a two-semester course. Each student will take the course during a different semester. During the second semester, each student will write an honors thesis. Completion of the thesis is required for a final grade in H195B.

197. Field Studies. (1-4) Course may be repeated for credit. One to four hours of field work per week, per unit. Must be taken on a pass/not pass basis.
**Graduate Courses**

200. Proseminar. (1) One and one-half hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. This course is designed to give to 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 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 photocopied articles or chapters of books provided by the department’s faculty. (F)

201. Applied Linguistics. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. A study of different applications of linguistic theory to the language issues. Typical topics will include some of the major analysis of Spanish, Portuguese, Catalan, and English, or the application of linguistics to the analysis of literary texts, or discourse analysis.

202. History of the Spanish Language. (3) Two or three hours of lecture per week. Formerly 202A. A survey of the development of Spanish from prehistoric times to the present, with particular stress on the Americas, but with due consideration of it elsewhere in the world. The course will be based on a standard textbook with assigned outside readings on specific topics; major members of the course, but will address such issues as vowel harmony, stress, phonetic changes, and the relationship of Spanish vowels to Romance in the context of the Semitic origin. Comparative perspective, combining historical grammar and external history. Also listed as Italian C201 and French C2.

203. Introduction to the Historical Grammar of Spanish. (3) Two or three hours of lecture per week. Formerly 202B. This course is intended as a preparation for advanced work in historical grammar. Primary consideration will be given to historical phonology and morphological structure in the various historical periods and the evolution of Spanish.

209. Seminar in Hispanic Linguistics. (3) Course may be repeated for credit. Two hours of seminar per week.

220. Introduction to Medieval Hispanic Literature. (3) Two or three hours of lecture per week.

221. Major Prose Authors of the Golden Age. (3) Two or three hours of lecture per week.

223. Major Poets of the Golden Age. (3) Two or three hours of lecture per week.

224. Major Dramatists of the Golden Age. (3) Two or three hours of lecture per week.

225. The Spanish Enlightenment. (3) Two or three hours of lecture per week.

226. Spanish Romanticism. (3) Two or three hours of lecture per week.

227A. The Spanish Novel to 1850. (3) Two or three hours of lecture per week.

227B. The Spanish Novel Since 1850. (3) Two or three hours of lecture per week.

228. Modern Spanish Drama. (3) Two or three hours of lecture per week.

229. Modern Spanish Poetry (After Romanticism). (3) Two or three hours of lecture per week.

232. Colonial Spanish American Literature. (3) Two or three hours of lecture per week.

234A. Modern Spanish American Poetry. (3) Two or three hours of lecture per week. A comprehensive survey of poetry in Latin America from 1890 to the present, with special attention given to the work of Ruben Dario and the heritage of Symbolism in Latin America.

234B. Modern Spanish American Poetry. (3) Two or three hours of lecture per week.

236A. Prose in American Literature. (3) Two or three hours of lecture per week.

236B. Modern Spanish American Prose. (3) Two or three hours of lecture per week.

242. Literary Theory and Criticism. (3) Two or three hours of lecture/seminar per week.

244. Spanish Versification. (1) One hour of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Training in the analysis of Spanish verse, including syllabification, meter, consonant rime, stanza, and rhythm.

246. Hispanic Paleography. (3) Two or three hours of lecture/seminar per week.

248. Special Topics. (1.5) Course may be repeated for credit as topic varies. Four hours of lecture/discussion per week. Topics will vary from semester to semester. Please consult the graduate assistant for current topic.

260. Cervantes. (3) Course may be repeated for credit with different topic and consent of instructor. Two or three hours of lecture/seminar per week. Prequisites: Graduate standing or consent of instructor. The reading and interpretation of the works of Cervantes, such as Don Quixote, the Novelas ejemplares, the Persiles, the Galatea, and the dramatic works. Focus will be on the achievement of the work and its influence on later literature.

270. The Colonial Period in Spanish America. (3) Course may be repeated for credit. Two or three hours of lecture/seminar per week.

276A. The Spanish American Novel. (3) Two or three hours of lecture/seminar per week.

276B. The Spanish American Novel. (3) Two or three hours of lecture/seminar per week.

278. The Literature of a Single Spanish American Country. (3) Course may be repeated for credit as topic varies. Two or three hours of lecture/seminar per week.

280. Seminar in Spanish American Literature. (3) Two or three hours of lecture/seminar per week.

299. Special Advanced Study. (3-4) 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)

601. Individual Study for Master’s Students. (3) Course does not satisfy unit or residence requirements for master’s degree. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Approval of graduate advisor. Individual study, such as the approval of the graduate advisor, 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. (F,SP)

602. Individual Study for Doctoral Students. (3) 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: Approval of graduate advisor. Individual study, subject to the approval of the graduate advisor, intended to provide an opportunity for students to prepare for the qualifying examination required of candidates for the Ph.D. 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, teaching, 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 three hours of laboratory per week. For students who have had no previous study of Portuguese, or who have had Portuguese 101 or equivalent, which is aimed at native speakers. Not open to students who have taken Portuguese 101 or equivalent, nor native speakers.

12. Elementary Portuguese. (5) Five hours of lecture and two hours of laboratory per week. (3) Course satisfies R&C requirement. Course is open to students who have taken Portuguese 101 or equivalent, or native speakers. Completion of this course qualifies students for Portuguese 8, 25, or 102.

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Prerequisites: Approval of instructor. 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.

26. Advanced Spoken Portuguese. (3) Three hours of lecture/discussion per week. Prerequisites: 8 or equivalent; consent of instructor. Course designed to increase communication skills (speaking ability and listening comprehension) as well as to improve vocabulary control and awareness of grammatical structure at a level beyond that of Portuguese 8. Some reading/laboratory work required. Not for native or near-native speakers. Enrollment limit: 16 students per section.

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Prerequisites: Pr-
Upper Division Courses

(Unless otherwise indicated, 20 units or equivalent of Portuguese or another Romance language are prerequisite to all upper division courses.)

101A. Portuguese for Advanced Students. (3) Three hours of lecture per week. Prerequisites: Credit of 16-20 units or equivalent of another Romance language, or consent of instructor. Must be taken concurrently with 101B. No independent study of the language. This offering may be taken independently for reading knowledge. In conjunction with 101B, it constitutes an intensive introduction to Portuguese, and prepares the student for further upper division course work. (F,SP)

101B. Portuguese for Advanced Students: Workshop. (2) Two hours of workshop per week. Prerequisites: Credit of 16-20 units or equivalent of another Romance language, or consent of instructor. Must be taken concurrently with 101A. No independent study of the language. Emphasis on understanding, speaking and writing Portuguese. Taken in conjunction with Portuguese 101A, the course provides an intensive introduction to the language. (F,SP)

102. Readings in Portuguese. (3) Three hours of lecture/discussion per week. Prerequisites: 101A-101B, 12, or equivalent. The continuation of Portuguese 101A-101B, this course focuses on a variety of texts with special emphasis on 20th-century Brazil. Discussion in Portuguese; reinforcement and development of language skills. (F,SP)

103. Advanced Grammar and Composition. (3) Three hours of lecture/discussion per week. Prerequisites: 1 to 4 and 102 or consent of instructor. Advanced work in Portuguese grammatical structures. Practice in writing. (F,SP)

104. Introduction to Brazilian Literature. (3) Three hours of lecture per week. Prerequisites: 4 or equivalent. A survey of Brazilian literature from the beginnings through the 20th century, with attention to the relationships between literature and society. (F,SP)

107A-107B. Survey of Portuguese Literature. (3-3) Three hours of lecture/discussion per week. Prerequisites: 4 or equivalent. A survey of Portuguese literature from the beginnings through the 17th century. (F,SP)

112. Portuguese Civilization. (3) Three hours of lecture per week. Prerequisites: 12 or equivalent. This course offers a historical-cultural perspective on Portugal since its formation to the present. It looks at key themes in the development of a specifically Portuguese identity, and examines the concept of “Portugueseness” in terms of the foundation of not only European, but also African, Asian, and American Portuguese-speaking societies. Course materials include works of poetry, fiction, and non-fiction. (F,SP)

113. Brazilian Civilization. (3) Three hours of lecture/discussion per week. Prerequisites: Twenty units or equivalent of Portuguese or another Romance language. This course presents an overview of major themes in Brazilian cultural expression with emphasis on the 19th and 20th centuries. (F,SP)

114. Contemporary Brazilian Novel. (3) Three hours of lecture per week. Prerequisites: Twenty units or equivalent of Portuguese or another Romance language. (F,SP)

128. Twentieth-Century Brazilian Literature. (3) Three hours of lecture per week. Prerequisites: 104 is recommended, but not required. An examination of the most important twentieth-century writers from the 1920s through the present. Emphasis on the shifting definition of “brasileiridade” and on new directions in contemporary poetry and fiction. (F,SP)

C134. Twentieth-Century Latin American Fiction. (3) Three hours of lecture per week. Formerly 134. This course presents major works by some of the best-known Brazilian writers alongside others by equally important Spanish American authors. The course provides a useful introduction to twentieth-century Latin American writing as a whole. Works in Spanish and in Portuguese are available as well in English, and lectures are in English. Also listed as Spanish C134.

135. Studies in Luso-Brazilian Literature. (2-3) Course may be repeated for credit as topic varies. Two or three hours of lecture per week. Prerequisites: Twenty units or equivalent of Portuguese or another Romance language. (F,SP)

137AC. American Oral Traditions: From Corridos to Party Dozens. (3) Three hours of lecture per week. The Chicano, Portuguese-American and African-American oral (and oral-based) traditions that provide the focus for this course all grow out of comparable ballad and verbal forms among various ethnic groups. The range of forms which this tradition assumes forces consideration of the different social circumstances in which they have evolved. The course thus addresses the issues of ethnicity, culture, race, and pluralism in the American context through oral tradition. Also listed as Spanish 137AC. This course satisfies the American cultures requirement. (Sater)

138. Portuguese/American Literature. (3) Three hours of lecture per week. The purpose of this course is to study the literary representations of the Portuguese, by themselves and by other, comparing them with the general representations of European-American, African-Americans and Latin Americans. Special attention will be given to Mexican Americans, Jewish-Americans and Chicanas.

148. Tendencies in Contemporary Brazilian Fiction. (1.5) Course may be repeated for credit as topic varies. Two hours of lecture for six weeks. Must be taken on a pass/no pass basis. Please see the undergraduate assistant in 5319 Dwinelle Hall for course description and more information.

180. Special Study for Undergraduates. (1-3) Course may be repeated for credit. Individual conferences. Prerequisites: Senior honors status and 20 units or equivalent of Portuguese or another Romance language. Special tutorial or seminar on selected topics. (F,SP)

H195. Portuguese Honors Course. (3) Individual conferences. Prerequisites: Twenty 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 Introduction to Courses and Curriculum section of this catalog. Must be taken on a pass/not passed basis. Prerequisites: Senior honors status and 20 units or equivalent of Portuguese or another Romance language. (F,SP)

Graduate Courses

244. Literature and Oral Tradition. (3) Two hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. This course looks at various theories of literacy and orally proposed by literary scholars, folklorists, and anthropologists. It applies a number of these to selected Latin American, and above all, Brazilian examples, including contemporary oral or semi-oral medium in recent credit. Reading knowledge of Spanish or Portuguese is normally required. (F,SP)

275. Critical and Stylistic Studies of a Single Author or Period. (3) Course may be repeated for credit as topic varies. Two hours of seminar per week. (F,SP)

296. Special Study for Graduate Students. (3-8) Course may be repeated for credit. Individual conferences. Sections 1-20 to be graded on a letter-graded basis. Sections 21-40 to be graded on a satisfactory/unsatisfactory basis. Prerequisites: Restricted to students writing doctoral dissertations.

Statistics

Department Office: 367 Evans Hall, (510) 642-2781 http://www.stat.berkeley.edu
Chair: John Rice, Ph.D.
Professors
David A. Freedman, Ph.D. Princeton University. Statistical inference, probability
Leo A. Goodman, Ph.D. (hon.) Princeton University. Applied statistics, statistical methods for the social sciences
Nicholas P. Jewell, Ph.D. University of Edinburgh. Biostatistics, surveys, geometric probability
Michael L. Jordán, Ph.D. University of California, San Diego. Machine learning, applied statistics, artificial intelligence
Michael J. Klass, Ph.D. Theoretical and applied probability
P. Warwick Millar, Ph.D. University of Illinois. Asymptotic theory, nonparametrics, stochastic processes
Deborah Nolan, Ph.D. Yale University. Density estimation, empirical processes
David A. Freedman, Ph.D. Hebrew University, Jerusalem
James W. Pitman, Ph.D. Sheffield University. Probability, stochastic processes
John Rice (Chair), Ph.D. University of California, Berkeley. Applied statistics, stochastic problems in neurophysiology
Thomas P. Speed, Ph.D. University of California, San Diego. Inverse problems, geophysics
Philip Stark, Ph.D. Scripps Institution of Oceanography, University of California, San Diego. Inverse problems, geophysics
Charles J. Stone, Ph.D. Stanford University. Nonparametric statistical modeling, statistical learning
Mark van der Laan, Ph.D. University of Utrecht. (the Netherlands) Semi-parametric methods and survival analysis
Kenneth W. Wachter, Ph.D. Cambridge. Multivariate analysis, demographic data
Upper Division Courses.

2, 20, 21, or 25 and some familiarity with computer
admission to the major. Recommended: Statistics

Transfer students lacking only the material on lin-
1A-1B and 53-54. Mathematics 53-54 must be

The Minor

Lower Division Courses. Required: Mathematics
1A-1B and 53-54. Mathematics 53-54 must be

Upper Division Courses: Statistics 101-102 or

The Graduate Program

The department offers the M.A., Cand. Phil., and
Ph.D. degrees. Information concerning the re-
quirements for these degrees is available in the
brochure Requirements for Higher Degrees in
Statistics, available upon request from the de-
partment graduate secretary. For specific details
the appropriate department graduate adviser
should be consulted.

In addition, the department, in conjunction with
the School of Public Health, offers degrees in bio-
statistics through the Interdepartmental Group
in biostatistics. There are two biostatistics gradu-
ate programs: M.A. and Ph.D. These programs are
appropriate for students who have either a strong
mathematical and statistical background with an
interest in biomedical sciences, or degrees in the bi-
ological sciences, and an interest in mathematics
and statistics. For further information see Bio-
statistics. For course listings in Biostatistics, see
Public Health.

The Statistical Laboratory

When founded in 1938, the Statistical Laboratory
was a unit of the Department of Mathematics and
combined research with an extensive instruction in
mathematical statistics. This instruction program
was interrupted with an extensive instruction in
mathematical statistics. This instruction program
was interrupted

Prerequisites: 101.

Prerequisites: Math 53 and 54.

Prerequisites: Consent of instructor.

Engineering Mathematical Statistics. The De-
cision of Engineering with the cooperation of the De-
cartment of Statistics offers a curriculum in engi-
neering mathematical statistics leading to the
degree of Bachelor of Science. (See also the sec-
tion on Program of Study in Engineering Science.)

Preparation for Graduate Study. Those inter-
ested in the major in this program should in-
clude in the undergraduate courses a strong foun-
dation in mathematics as well as probability and
statistics. For Ph.D. degrees of the theoretical type,
Mathematics 104, 105, 110, 113, and 185 are
necessary. For Ph.D. degrees of the applied type
and the M.A. degree, at least a year of upper division
probability and statistics (or course 200A-200B)
and Mathematics 104 and 110 are needed. It is
recommended that all students acquire familiarity
with computer programming. Ph.D. students are
encouraged to acquire fluency in French, German,
or Russian.

The Statistical Computing Facility

The Statistical Computing Facility provides com-
sulting service in statistics for graduate students
and faculty in other disciplines. The consultants are
subject matter experts in all areas related to

Senior Lecturers

Roger Pugel, Ph.D., University of California, Berkeley.
Foundations of probability, measurability
J. P. Shaffer, Ph.D. (Emeritus)

Statistical Computing Facility

Peter J. Bickel (Director), Ph.D., University of California,
Berkeley. Nonparametric inference, asymptotic methods

Department Overview

Service Courses. The department offers a variety of
introductory service courses differing both in
mathematical level and in topics emphasized.
Statistics 2 requires only high school mathematics;
20, 21, and 25 require some calculus; 20 is for
students generally. 21 is intended for business stu-
dents and 25 for engineers. Statistics 131A-131B
is a one-year upper division sequence, empha-
sizing inference methods used in social and life sci-
ences. Statistics 134-135 is a one-year upper divi-
sion sequence, emphasizing inference methods
used in engineering and physical sciences.
Some courses may have online compo-
nents.

The Major

Lower Division Courses. Required: Mathematics
1A-1B and 53-54. Mathematics 53-54 must be
completed with minimum grades of C in each.

Upper Division Courses: Statistics 101-102 or
134-135 for students interested in Statistics 150A,
151A, 151B, 152, 153, 154, 155, and 156, includ-
ing at least one course with a laboratory.

The courses for the minor must have the approval
of the minor adviser.

The Minor

Lower Division Courses, Required: Mathematics
1A-1B and 53-54. Mathematics 53-54 must be
completed with minimum grades of C in each.

Upper Division Courses. Mathematics 110;
Statistics 101-102 or 134-135 for students interested
in Statistics 150A, 151A, 151B, 152, 153, 154, 155,
and 156, including at least one course with a labora-

Priorities given to freshmen and sophomores.

Prerequisites: One semester of calculus. For students with mathematical
background who wish to acquire basic concepts.

Relational frequencies, discrete random vari-
ables, expectation. Testing hypotheses. Estimation. Il-
ustrations from various fields. (F,SP)

21. Introductory Probability and Statistics for
Business. (4) Students who have taken 2, 2X, 5, 20, 21X, or 25 will
receive no credit for 21. Three hours of lecture
and two hours of laboratory per week. Prerequi-
tes: One semester of calculus. Descriptive statistics,
probability models and related concepts, sample sur-
evies, estimates, confidence intervals, tests of signifi-
cance. Controlled experimental and observational stud-
ies, correlation and regression. (F,SP)

24. Freshman Seminars. (1) Course may be
repeated for credit as topic varies. One hour of seminar
per week. The Berkeley 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. Berkeley Seminars are of-
fered in all campus departments, and topics vary from
department to department and semester to semester.

25. Introductory to Probability and Statistics
for Engineers. (3) Students who have taken 2, 2X, 5, 20, 21X,
or 25 will receive no credit for 25. Three hours of lec-
ture and one hour of laboratory per week. Prerequi-
tes: A year of calculus. Emphasis on concepts and
applications. Conditional probability, Independence.
Expectation. Standard discrete and continuous distri-
butions. Regression and correlation. Point and interval
estimation. Illustrations from engineering. (F,SP)

39. Freshman/Sophomore Seminar. Course may
be repeated for credit as topic varies. One semester of
course may be repeated on a letter-grade basis. Sections 3-4 to be
graded on a passed/not passed basis. Prerequisites: Consent of in-
structor. Must be taken at the same time as either Statistics 2 or
21. This course assists lower division statistics stu-
dents with structured problem solving, interpretation and making conclusions. (F,SP) Purves

Upper Division Courses

101. Introduction to the Theory of Probability. (4)
Students will not receive credit for 101 after taking 134.
Three hours of lecture and one hour of laboratory per
week. Prerequisites: Math 53 and 54. Random vari-
able theory and their applications. Probability models, central limit theorem, statistical applications,
dependence, multivariate normal distribution, condi-
tioning, simulation, and other computer applications.

102. Introduction to the Theory of Statistics. (4)
Students will not receive credit for 102 after taking 135.
Three hours of lecture and one hour of laboratory per
week. Prerequisites: 101. Least squares estimates, t
tests, F tests, and the application of these procedures
to the design and analysis of experiments. Maximum

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R&Co requirement
AC suffix=course satisfies American cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
131A. Statistical Inferences for Social and Life Scientists. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: One semester of calculus. Ideas for analysis and hypothesis testing basic to applications. Linear estimation and normal regression theory. (F,SP) 134. Concepts of Probability. (3) Students will not receive credit for 134 after taking 130. Three hours of lecture per week. Prerequisites: One year of calculus. An introduction to probability, emphasizing concepts and applications. Conditional expectation, independence, laws of large numbers. Discrete and continuous random variables. Central limit theorem. Selected topics such as the Poisson process, Markov chains, characteristic functions. (F,SP) 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: 101 or 134. 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, renewal theory, stationary processes, Gaussian processes. (SP) 151A-151B. Linear Modelling: Theory and Application. (4,4) Three hours of lecture and two hours of laboratory per week. Prerequisites: 102 or consent of instructor. A coordinated treatment of linear and generalized linear models and their application. Linear regression, analysis of variance and covariance, random effects, design and analysis of experiments, quality improvement, log-linear models for discrete multivariate data, model selection, robustness, graphical techniques, productive use of computers, in-depth case studies. (F,SP) 152. Sampling Surveys. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: 101, 131A or 134. Theory and practice of sampling from finite populations. Simple random, stratified, cluster, and double sampling. Sampling with unequal probabilities. Estimators including ratio, regression, and difference estimators. Error estimation for complex samples. 153. Introduction to Time Series. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: 101, 131A or consent of instructor. 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, spectral analysis. 155. Game Theory. (3) Three hours of lecture per week. Prerequisites: 101 or equivalent. General theory of zero-sum, two-person games, including games in extensive form and continuous games, and illustrated by detailed study of examples. 157. Seminar on Topics in Probability and Statistics. (3) Three hours of seminar per week. Prerequisites: Math 53-64 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 in the bulletin. H195. Special Study for Honors Candidates. (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. (F,SP) Staff 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) 205A-205B. Probability Theory. (4,4) Three hours of lecture per week. Prerequisites: Some knowledge of real analysis and metric spaces, including compactness, 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, distributions. Laws of large numbers and central limit theorems for independent random variables. Characteristic function methods. Conditional expectations; martingales and theory of convergence, Markov chains. Stationary processes. (F,SP) 206A-206B. Stochastic Processes. (3,3) Course may be repeated for credit with different instructor. 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, diffusions, Levy processes, Markov processes, martingales, Gaussian processes and further topics. (F,SP) 210A-210B. Theoretical Statistics. (4,4) Three hours of lecture per week. Prerequisites: A year of graduate 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-212B. Topics in Theoretical Statistics. (3,3) Course may be repeated for credit with different instructor. Three hours of lecture per week. Prerequisites: 210 or 205 and 215. This course introduces the student to topics of current research interest in theoretical statistics. Typical topics, which change from year to year, include the following: parametric, nonparametric and nonparametric modeling; time series and survival analysis; model selection; empirical and point processes; asymptotic behavior of bootstrap, stochastic search and Markov chain Monte Carlo; convergence of experiments; minimum distance methods. (F,SP) 215A-215B. Statistical Models: Theory and Application. (4,4) Three hours of lecture and two hours of laboratory per week. The techniques of applied statistics. Data types and structures. Model formulation, fitting and validation. The principal models. Planning and design. Difficulties that arise. Usage of statistical computer packages. Presentation of conclusions. (F,SP) 230A. Linear Models. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Matrix algebra, a year of calculus, two semesters of upper division or graduate probability and statistics. Theory of least squares estimation, interval estimation, and tests under the general linear fixed effects model with normally distributed errors. Theory for non-normal linear models. Two and higher way layouts, residual analysis. Effects of departures from the underlying assumptions. Robust alternatives to least squares. (F) 232. Experimental Design. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: 200B or equivalent. Randomization, blocking, factorial design, confounding, fractional replication, response surface methodology, optimal design. Applications. (SP) 236. Analysis of Discrete Observations. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: 102. Discrete stochastic models, generating functions, birth-death processes. Contingency tables; sources, models, sampling schemes, analysis, Markov chains, log linear, logistic regression. Applications for models. Power. Chi-square. Quasi response; prob- bit, logit. Asymptotics. Cluster analysis. 238. Bayesian Statistics. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Calculus, linear algebra, basic probability and statistics. Bayesian methods: conditional probability and prior and posterior distributions for parameter and multiparameter models, hierarchical models, predictive checking and sensitivity analysis, linear and generalized linear models, mixtures, time series, spatial models. Simulation topics: MCMC. Experimental design. Case studies of applied modeling. Bayes theory; asymptotics, decision theory, randomization. The selection of topics may vary from year to year. 240. Nonparametric and Robust Methods. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: A year of upper division probability and statistics. Standard nonparametric tests and confidence intervals for continuous and categorical data; nonparametric estimation of quantiles; robust estimation of location and scale parameters. Efficiency comparison with the classical procedures. (F) 241A. Statistical Learning Theory. (3) Three hours of lecture per week. Prerequisites: Linear algebra, calculus, basic probability and statistics, algorithms. Classification and regression, dimensionality reduction, and density estimation. Mixture models, hierarchical models, factorial models, hidden Markov and state space models. Markov properties and recursive algorithms for general probabilistic inference. Nonparametric methods including decision trees, kernel methods, neural networks, and wavelets. Ensemble methods. (F,SP) Staff 261A. Statistical Learning Theory. (3) Three hours of lecture per week. Prerequisites: Linear algebra, calculus, basic probability, and recommended Computer Science 289. Classification regression, dimensioning, density reduction, and etimation. Mixture models, hierarchical models, factorial 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 Computer Science C281A. (F) Jordan, Russell 241B. Advanced Topics in Learning and Decision-Making. (3) Three hours of lecture per week. Recent topics include: Graphical models and approximate inference algorithms. Markov, hidden Monte Carlo, mean field, and probability propagation methods. Model selection and stochastic realization. Bayesian, information-theoretic and structural risk minimization approaches. Markov decision processes and partially observable Markov decision processes. Reinforcement learning. (SP) Staff 241B. Advanced Topics in Learning and Decision-Making. (3) Three hours of lecture per week. Prerequisites: C241A. Recent topics include: Graphical models and approximate inference algorithms. Markov chain Monte Carlo, mean field and probability propagation methods. Model selection and stochastic realization. Bayesian information theoretic and structural risk minimization approaches. Markov decision processes and partially observable Markov decision processes. Reinforcement learning. Also listed as Computer Science C281B. (SP) Jordan, Russell 242A-242B. Analysis of Multidimensional Data. (4,4) Three hours of lecture and two hours of laboratory per week. Prerequisites: A graduate course in Statistics. Graphical exploration and representation of multivariate data. Model based and model free dimensionality reduction. Analysis of variance, multiple regression, and discrimination methods. Variable se-

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 statistical software packages and computational packages. Use of graphical displays in data analysis. Statistical data base management. (F)

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. Non-linear optimization and applications to statistical procedures. Other topics of current interest, such as issues of efficiency, and use of graphics. (SP)

246. Statistical Genetics. (4) Three hours of lecture and two hours of laboratory per week. Modelling meiosis, linkage analysis, genetic epidemiology, Clones libraries, physical mapping of chromosomes. Radiation hybrid mapping. DNA and protein sequence analysis, molecular evolution, sequence alignment, database searching, Analysis of microarray expression data. (SP) Staff

248. Analysis of Time Series. (3) Three hours of lecture and two hours of laboratory per week. Prerequisites: 102 or equivalent. Frequency-based techniques of time series analysis, spectral theory, linear estimation of spectra, estimation of transfer functions, design, system identification, vector-valued stationary processes, model building.

250. Applied Stochastic Processes. (3) Course may be repeated for credit. Three hours of lecture per week in aspects of applied stochastic processes. Offered according to student demand and faculty availability.

260. Topics in Probability and Statistics. (3) Course may be repeated for credit. Three hours of lecture per week in topics in probability and statistics offered according to student demand and faculty availability.

C261. 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; linear models and latent-variable analysis; the analysis of cross-classified data having ordered 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 course work in applied statistics and permission 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 sciences and will perform special tasks in handling such problems. There will be working sessions with researchers in substantive fields and occasional lectures on consulting. (F,SP)

278B. Statistics Research Seminar. (1-4) Course may be repeated for credit. Two or more hours of seminar per week. Special topics, by means of lectures 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 at all levels of the department’s curriculum. This course provides first year graduate students with an introduction to the Statistical 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 undergraduate courses. (F)

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. 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)

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)

Professional Courses

300. Professional Preparation: Teaching of Probability 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 standing and appointment as a graduate student instructor. Designed primarily for undergraduate tutors in statistics, this course treats tutoring as an educational experience. Focuses on apprenticeship program. Topics include probing skills, theories of learning, concept mapping.

Theater, Dance, and Performance Studies
(The College of Letters and Science)

Department Office: 101 Dwinelle Annex, (510) 642-1677
Chair/Director: W.B. Worthen, Ph.D.

Professors
Joe Goode, B.A. Virginia Commonwealth University. Dance, choreography
Mel Gordon, Ph.D. New York University. Stanislavsky, directing, acting
Mark Griffth, Ph.D. Cambridge University. Classical Greek drama
†Marti Thomas Wood, B.A. Sarah Lawrence College. Dance, choreography
W.B. Worthen, Ph.D. Princeton University. Dramatic literature, theory
Robert W. Goldsbry, M.F.A. (Emphasis)
Dunbar Ogger, B.A. (Emphasis)
Henry May, B.A. (Emphasis)
Marvin Rosenberg, Ph.D. (Emphasis)
John Warren Stull III†
†David C. K. Wood, B.A. (Emphasis)

Associate Professors
Chris Berry, Ph.D. University of California, Los Angeles. Asian film history and theory
Sharon H. Jackson, Ph.D. Northern University. Performance theory, 20th-century drama

Lecturers
Martin Berman, B.A. Acting
Lora Dolas, M.A. Acting

Christopher Dolder, M.F.A. Dance
Kate Edmunds, M.F.A. Set design
David K. H. Elliott, B.A. Design
Christopher Herald, Ph.D. Acting and directing
Jennifer Johnson-Maranta, M.A. Dance history
Carol Marta (SCE)/M.A. Dance
Deborah Sussel, B.F.A. Acting
Carol Bradbury (Emphasis). Dance, dance music
Carol Egan (Emphasis). B.S. Dance, choreography, criticism

Affiliated Faculty
Janet Adelman (English)
Joel Allenman (English)
Judith Butler (Rhetoric and Comparative Literature)
VeVe Clark (American Studies)
Vasudha Daima (South and Southeast Asian Studies)
Dru Dougerty (Spanish and Portuguese)
Sudnya Hartman (English)
Anton Kaes (German and Film Studies)
Karen Kaplan (Women's Studies)
John McWhorter (Linguistics)
Laura Perez (Ethnic Studies)
Mimay Sae (Comparative Literature and East Asian Languages and Cultures)
Mary Aroo (Music)
Minh-Minh T. Trinh (Women's Studies)
Margaret B. Wilkerson (African American Studies)

At Berkeley, we understand performance as a mode of critical inquiry and creative expression. Theater, dance, and performance studies are well-prepared for the future. The flexibility and

Separate major/minor degree programs are offered in drama and dance, and students are encouraged to specialize within each program. Although all students fulfill general requirements in all areas of theater or dance practice and performance studies, these programs specialize in one of several areas: acting, contemporary dance and choreography, directing, design, technical production, or drama/theater/performance studies. All students at Berkeley are re-
integration with the humanities characteristic of the major makes them excellent candidates for graduate and professional schools, as well as for continued work and education in theater and dance.

Several students have recently been honored by the American College Theater Festival. The department produces a mainstage season of productions. For further information, inquire at the Department of Theater, Dance, and Performance Studies office.

**Upper Division.** Students should choose, in consultation with the Theater and Performance Studies office.

**Lower Division.** One course chosen from 10, 25AC, 26, 52AC, 60, 137AC, or African American Studies 29AC.

**Upper Division.** Five upper division theater arts courses (three of which must be taken at Berkeley) by adviser approval. A minimum GPA of 2.0 must be maintained in the upper division units for the minor.

All students in the theater and performance studies minor are required to take Stagecraft. Students may choose to take the course at the lower or upper division level (60 or 160).

**Dance and Performance Studies Minor**

Students should choose, in consultation with the faculty or staff adviser, an area of concentration from the upper division dance courses in theater arts or from other departments. Sample programs are available in the department office.

**Lower Division Courses**

**R1B. Introduction to Dramatic Literature.** (3) Three hours of lecture/discussion per week. Prerequisites: Subject A, examination or course. Dramatic Art 1A or its equivalent is requisite to 1B. Formerly 1B. 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. (F,SP)

**Introduction to Acting.** (3) Six hours of studio session per week plus presentation of production to be arranged. Prerequisites: Audition required. 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. (FSP) Staff

**Scene Study and Characterization.** (3) Six hours of session per week. Prerequisites: Consent of instructor. 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. (FSP) Staff

**Staff**

**3. Speech and Vocal Communication Skills.** (2) Four hours of studio per week. Prerequisites: Consent of instructor. The objective of this course is to foster the finest 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 pass/no credit basis. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP)

**25AC. The Drama of American Cultures: An Introduction to Our Theater.** (4) Three hours of lecture per week. Prerequisites: Consent of instructor. 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 theater productions offered on campus and in the Bay Area. This course satisfies the American cultures requirement. (F,SP)
26. Issues in World Theater. (4) Three hours of lecture per week. In each semester an issue of broad relevance to world theater will be addressed through the study of four to six diverse theatrical traditions/practices western, non-western, musical, and dance-based forms of theater. Texts may include playscripts, video and/or audio recordings, and historical and critical documents. (F,SP) Staff

30. Movement for Actors. (2) Three hours of lecture per week. Staff

39. Freshman/Sophomore Seminar. (1-3) Course may be repeated for credit as topic varies. One to three hours of seminar per week. Prerequisites: Priority given to freshmen and sophomores. Freshmen 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)

40A-40B. Beginning Modern Dance Technique. (1-3) Course may be repeated for credit. Seven and one-half hours of studio per week. Prerequisites: Audition and consent of instructor. Study in elementary body alignment and basic locomotor patterns, utilizing the body as a totality. (F,SP)

52AC. Reflections of Gender, Culture, and Ethnicity in American Dance. (3) Three hours of lecture per week. Working with the premise that the context, content, and form of any dance event serve as a window on dance and dance association with at least three of the following groups: African Americans, Asian Americans, indigenous peoples of the United States, Chicano/Latinos, and European Americans. We will look at traditional and modern dance events as well as theatrical and nontheatrical currents in American dance. This course satisfies the American cultures requirement. (F,SP) Johnson

60. Stagecraft. (3-4) Two hours of lecture per week and 60 hours of laboratory per semester. Prerequisites: Consent of instructor. This course is a practical introduction to the theories, approaches, and applications of construction techniques for the scenic environment, and will be directed to such aspects of production as scenery, light, sound, costume, 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 departmental productions. (F,SP)

66. 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 per unit. Prerequisites: Consent of instructor. Topics vary from semester to semester and have included The Power of Music and Poetry in the Theater; Modern Drama and Theater; 1940 to the Present: Theaters, Tricksters, and Cultural Exchange; Art as Social Action; and The Invisible World (Process Seminar). (F,SP) Staff

98. Directed Group Study. (0.5-5) 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 independent study per week. Must be taken on a pass/no pass basis. Graded credit included in the departmental curriculum. Topics may be initiated by students. (F,SP)

99. Independent Study. (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 independent study per week. Must be taken on a pass/no pass basis. Prerequisites: Open to sophomore students with an overall grade point average of 3.5. Study of a topic not included in the regular department curriculum. (F,SP)

Upper Division Courses

C107. Plays of Ibsen. (3) Three hours of lecture/discussion per week. An examination of the historical and discussion of Ibsen's major plays. Readings and discussion in English. Also listed as Scandinavian C107. (F) Sandberg

C108. Strindberg. (3) Three hours of lecture per week. Reading and discussion of Strindberg's major works; emphasis on his life and his significance. Readings and discussion in English. Also listed as Scandinavian C1108. (F,SP)

110A-110B. Intermediate Acting. (3-3) Course may be repeated for credit. Six hours of studio per week. Prerequisites: Audition, one year of undergraduate work in acting as an actor. (F,SP)

111. Advanced Acting. (3) Course may be repeated for credit. Six hours of sessions per week plus preparation and rehearsals. Prerequisites: IIA-110AB or 111 or consent of instructor. Formerly 210. Intensive group study, rehearsal, and performance of a play or selected dramatic pieces. (F,SP)

115. Advanced Acting: Company Class. (3) Six hours of sessions per week plus preparation and rehearsals. Prerequisites: IIA-110AB or 111 or consent of instructor. (F,SP)

119. Performance Theory. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. An examination of a theoretical topic or perspective on performance, with specific attention to the interface between narratives and performance; dramatic, nondramatic, and nontheatrical modes of performance; may involve visiting artists. Topics vary from semester to semester. (F,SP) Staff

120. Twentieth-Century Theory and Performance. (3) Three hours of lecture per week. Prerequisites: I'AB, 250A, or consent of instructor. This course will present an overview of representative works and documents, theorists, and performance texts from modern and contemporary drama and performance theory. These texts will be enriched by theoretical readings from Artaud, Brecht, Brook, Cocteau, Schechner, Stanislavski, and Suzuki, among many others, along with performance texts and taped live performances of works by Chekhov, Churchill, Kroetz, The Living Theatre, R. Wilson, Gonzalez-Pena, Valdez, and others. The emphasis will be placed on the creative discourse between theory and performance and the creative application of recent and contemporary theories of performance to the production of new works. (F,SP)

121. Performance and Culture. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. 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 practice. Topics vary from semester to semester. (F,SP) Staff

125. Performance and History. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. 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 practice. Topics vary from semester to semester. (F,SP) Staff

126. Performance Literatures. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. An examination of the historical and cultural dynamics of drama, with specific attention to the relationship between methods of literary studies and performance; may involve visiting artists. Topics vary from semester to semester. (F,SP) Staff

127. Topics in Drama and Theater: 1918 to Present. (3) Course may be repeated for credit. Three hours of lecture per week. Contemporary drama.

128. Shakespeare in Performance. (3) Three hours of lecture per week. An examination of the history and development of Shakespearean drama in terms of performance, drawing on productions at California Shakespeare Festival and Shakespeare Santa Cruz, video and film, essays and reviews, and the instructor’s directorial experience. (F) Staff

129. Senior Proseminar. (3) Course may be repeated for credit subject to acceptance of petition. Three hours of lecture per week. Prerequisites: 1120, senior standing, or consent of instructor. Study of the works of a major playwright, choreographer, or designer, or a major period of artistic activity in the theater. (F,SP) Staff

130. Dance and Dance-Drama of India. (3) Three hours of lecture per week. Prerequisites: Any Reading and Composition course (1A-1B) or consent of instructor. An introduction to the diverse styles of Indian dance and the role in Indian culture of the history and development of Indian dance and dance-drama and their importance in traditional, as well as modern, Indian society. The elements of dance, vocal, and instrumental music, poetic, and prose texts, mime, dialogue, costumes, make-up, and masks will be compared in major forms. Readings will be drawn from an extensive body of scholarship on the principal styles of dance. Students will have the opportunity to learn some of the musical rhythms and dance movements. (F,SP) Staff

C131A. African American Plays from 1858 to 1959. (4) Three hours of lecture per week. Prerequisites: Reading and composition requirement. Historical surveys of African American plays, with a focus on the portrayal of the black experience in theatre, emphasis on predominant themes, structural tendencies, socio-historical context. Also listed as African American Studies C151A.

C131B. Contemporary African American Drama. (4) Four hours of lecture per week. Prerequisites: 151A or consent of instructor. Survey of contemporary plays by African American writers and the portrayal of the black experience in American theatre. Emphasis on predominant themes, structural tendencies, socio-historical context. Also listed as African American Studies C151B. (SP) Wilkerson

C132. African American Dramatic Literature: Forms and Periods. (3) Three hours of lecture per week. Introduction to play analysis with emphasis on the primary theatrical form of styles chosen by African American playwrights and the thematic consequences of those choices. Plays will be analyzed both as literature and as theatrical production; e.g., laboratory work will include attendance at plays and performance of plays. Also listed as African American Studies C152C.

C133. History of the African American Musical Theatre. (3) Course may be repeated for credit subject to acceptance of petition. Three hours of lecture per week. Prerequisites: Dramatic Art 120, senior standing, or consent of instructor. This course will cover the origins and development of musical theatre creations, starting with the minstrel show and developing through the major styles of African American musical theatre. Also listed as African American Studies C148.

137AC. Across Disciplines: 20th-Century Art Forms. (4) Three hours of lecture per week. This course is an introduction to and comparative exploration of parallel developments in the works of 20th-century artists using examples from various art forms including dance, painting, sculpture, printing, writing, theatre and performance art. The course will focus on the work of individual artists and examine how different perspectives, exchanges of materials and borrowings of forms define and transform what comes to be considered art. This course satisfies the American cultures requirement.

139. Playwriting. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. Formerly Dramatic Art 139A-139B. Potential forms of dramatic composition. Group readings and discussion of written work. (F)

141A-141B. Intermediate Modern Dance Technique. (1-1) Course may be repeated for credit.
442 / Theater, Dance, and Performance Studies

Seven and one-half hours of studio per week. Prerequisites: 404A-40B, audition, or consent of instructor. Development of physical control through off-center movement and its utilization in spatial exploration. (F,SP)

142A-142B. Advanced Modern Dance Technique. (1-1) Course may be repeated for credit. Seven and one-half hours of studio per week. Prerequisites: 141A-141B, audition, or consent of instructor. Refinement of movement techniques and qualitative analysis of movement with regard to rhythm, dynamics, and style. (F,SP)

143A-143B. Company Class. (1;1) Course may be repeated for credit. Seven and one-half hours of studio per week. Prerequisites: 142A-142B, audition, or consent of instructor. Exploration of existing styles and forms of dance technique as a means of communication in the theatre. Use of basic fundamental techniques as a means of extending natural movement in rhythm, energy, and space with emphasis on style and qualitative analysis. (F,SP)

144. Sources of Movement. (3) Two hours of lecture per week and 60 hours of laboratory per semester. Prerequisites: Consent of instructor. This course is an advanced discussion and practice of theories, approaches, and applications of techniques used in the production environment, and includes attention to such aspects of production as scenery, lights, sound, costumes, and stage management. There will be special emphasis on production organization and problem solving in connection with the laboratory dimension of the course. Students will work in a supervisory capacity on departmental productions. (F,SP)

160. Stagecraft. (3) Two hours of lecture per week and 60 hours of laboratory per semester. Prerequisites: Consent of instructor. This course is an advanced discussion and practice of theories, approaches, and applications of theories, approaches, and applications of techniques used in the production environment, and includes attention to such aspects of production as scenery, lights, sound, costumes, and stage management. There will be special emphasis on production organization and problem solving in connection with the laboratory dimension of the course. Students will work in a supervisory capacity on departmental productions. (F,SP)

162. Fundamentals of Stage Directing. (3) Four hours of lecture/discussion per week plus preparation and rehearsals to be arranged. Prerequisites: 10 or 120; Junior standing and consent of instructor. Beginning study of principles of stage composition, blocking, and analysis of dramatic texts for the director. (F,SP)

163. Stage Directing. (3) Four hours of lecture/discussion per week. Prerequisites: 162 or consent of instructor. Study of principles and practice of stage directing. (F,SP) Staff

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 lecture or three hours of laboratory per week per unit. Prerequisites: Consent of instructor. Topics vary from semester to semester and have included The Power of Music and Poetry in the Theater; Modern Drama and African American Theater; Shakespeare and the Theater; Playwriting as a Profession; American and European Drama and Theatre; Modern Drama and the Theatre; Theatrical Realization of Dramatic Texts; Creative Writing in the Theater; Ancient Greek Theatre: A History of the Stage; and Theatrical Design: The Art of the Stage. (F,SP)

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. Non-performing participation in the University Theatre to include: Stage management; crew assistance in lighting, sound, properties, costumes, make-up, backstage technical assistance in scene or costume shop. (F,SP)

171. Theatre Performance. (1) Course may be repeated for credit. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Practical study and/or dance in Dramatic Art productions. (F,SP)

172. Advanced Production Study. (3) Course may be repeated for credit. Three hours of lecture per week and laboratory to be arranged. Prerequisites: Consent of instructor. Formerly 172A-172B. Study of production techniques including role of management, stage management, and theatre 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: 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-175B. 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. An introduction to theatrical lighting, including practical application through Dramatic Art productions. (F,SP)

176. Applied Theatrical Design. (1-3) Course may be repeated for credit. Two hours of lecture/discussion and five hours of laboratory per week. Prerequisites: One semester of theatrical design (173, 174, 175) or equivalent and at least 75 production hours of experience. Students of set, costume, and lighting design must have had at least 75 production hours of experience, sufficient practical experience, and knowledge of the practical application of design to the stage in departmental productions. Interaction and team approach of the designers will be promoted from the earliest stages of conceptualization through the opening night and the run of production(s). (F,SP) Staff

178. History of Costume. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: Consent of instructor. History of costume in relation to social change. Laboratory instruction in conservation and restoration of costumes. (F,SP)

179. Supervised Theatrical Design. (1-3) Course may be repeated for credit. Five hours of laboratory per week. Prerequisites: 179A or 179B, 174A or 174B, 175A or 175B, or consent of instructor. Students are trained in the working methods of set or costume designers and are given the opportunity to design 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. Six hours of lecture and twelve hours of laboratory per week. Prerequisites: Audition or consent of instructor. This course relates choreography to theatrical presentation. Laboratory hours are spent in attendance at rehearsal, coaching sessions, and the performance of the play or concert. The theatre director or concert choreographer will be encouraged to choreographing the major dance production at the departmental season. (F,SP) Staff

181. Theatrical Realization of Dramatic Texts. (1-3) Course may be repeated for credit. Six hours of lecture and twelve hours of laboratory per week. Prerequisites: Audition or consent of instructor. This course relates dramatic texts or choreography to theatrical presentation. The lectures are based on the analysis of the work being presented. 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

C183A. Performance: An African American Perspective. (3) Three hours of lecture per week. Prerequisites: 1A or consent of instructor. Introduction to the Research-to-Performance Method, African American aesthetics and dramatic performance techniques. Course will survey wide range of writings on performance and investigate applications through exercises and improvisations. Students will also assist in information gathering for works in progress. Also listed as African American Studies C143A.

C183B. Research-to-Performance Laboratory. (3) Three hours of lecture per week. Prerequisites: 1A or equivalent or consent of instructor. 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 theatre production. Also listed as African American Studies C143C.

C183C. Black Theatre Workshop. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 1A or equivalent or consent of instructor. 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 theatre production. Also listed as African American Studies C143C.

191. Framing the Arts at UC Berkeley. (5;1) One and one-half to two and one-half hours of lecture for six weeks. Two and one-half to five hours of lecture for three weeks. The focus of this course varies based on the exhibits, screenings, and performances being presented at the Berkeley Art Museum, Pacific Film Archive, and Cal Performances. The work of well-established artists is used to illustrate historical trends; emerging artists illustrate cutting-edge developments. This course encourages students to integrate the arts.
Undergraduate and Interdisciplinary Studies / 443

Undergraduate and Interdisciplinary Studies

(College of Letters and Science)

Office: 301 Campbell Hall, (510) 642-6108
http://LS.berkeley.edu/UGIS/ugis.html
Divisional Dean: Kwong-loi Shun, Ph.D.

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 shaping 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 curricular development geared toward ideals of a liberal arts education. We are especially dedicated to creating programs such as the Freshman Seminar Program and the Undergraduate Research Program that nurture productive intellectual relationships between faculty members and students.

Field Major

Interdisciplinary Studies. The ISF major affords undergraduates a thoroughly interdisciplinary framework for their studies. The program allows students to establish individualized areas of concentration in the humanities, sciences, and/or the professional schools and colleges.

Group Majors

American Studies. This group 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 studies courses will attempt to take into account how the cultures of America have been continually reshaped by movements of people, commerce, and ideas focusing on the power structures that nurture productive intellectual relationships between faculty members and students.

Environmental Sciences. The environmental sciences major is jointly administered by the College of Letters and Science and 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 documentation and prediction of environmental problems and for making sound recommendations for their avoidance or mitigation.

International and Area Studies. The International and Area Studies Teaching Program office (101 Stephen Hall, (510) 642-4466) administers majors in Asian studies, Development studies, Latin American studies, Middle Eastern studies, peace and conflict studies (PACS), and political economy of industrial societies (PEIS). For information about those group majors, see the International and Area Studies section of this catalog.

Mass Communications. 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 a particular religious tradition. The major views religion from a global perspective and combines aspects of the humanities and social sciences. A religious studies minor is also available.

Minor Programs

The Creative Writing Minor requirements consist of three upper division creative writing courses and two interdisciplinary 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, 301 Campbell Hall. A student handbook outlining minor requirements in detail is available at the minor office. For more information, call the UGIS office, (510) 642-0108 or visit the web site at http://learn.berkeley.edu/ugis/lgbt.

Lesbian, Gay, Bisexual, and Transgender (LGBT) Studies Minor. Established in fall 1995, the LGBT studies minor offers students an interdisciplinary investigation of sexuality as a complicated historical and cultural phenomenon. LGBT studies address the particularities of the modern forms of sexuality we call lesbian, gay, bisexual, and transgendered, and further address the phenomenon of sexuality itself in all its historical and cross-cultural diversity. The minor consists of four core courses (UGIS 20AC, C145, C146, C147B) and two upper division electives approved for the minor program. A student handbook outlining minor requirements in detail is available at the UGIS office in 301 Campbell Hall, (510) 643-0554 or on the web site at http://ls.berkeley.edu/ugis/lgbt.

Other Programs

In addition to the majors listed above, the Office of Undergraduate and Interdisciplinary 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 (216 Dwinnelle Annex, (510) 642-5570), designed to help undergraduates establish fluency and control over their reading and writing skills, is also in the Office of Undergraduate and Interdisciplinary Studies.

The Freshman Seminar Program offers lower division students the opportunity to study a broad range of actual topics in the company of a faculty member and a small number of peers. A freshman seminar may search for awards on Scholarship Connection’s online database, http://scholarships.berkeley.edu. In addition to providing information on many externally funded awards, Scholarship Connection also administers the campus recruitment and selection for several highly competitive awards such as the Rhodes, Marshall, and Truman Scholarships. Scholarship Connection offers individual advising to help applicants prepare competitive applications for these prestigious awards. For more information, visit http://scholarships.berkeley.edu or contact Scholarship Connection, 301 Campbell Hall, scholarships@learning.berkeley.edu, (510) 643-6929.

The UC Berkeley-Washington Program allows undergraduates to spend a semester in Washington, D.C. Students in the program combine coursework with field research in an internship that reflects each student’s particular area of interest. For more information, please call (510) 642-9102, 331 Campbell Hall, or visit the web site at learning.berkeley.edu/ucd/cw.

The Office of Undergraduate Research (OUR) seeks to involve undergraduates more deeply in the research life of the University. To this end, OUR coordinates and develops programs and resources that bring undergraduates into the field, laboratories, and archives. For information on research workshops and the great variety of undergraduate research opportunities at Berkeley, visit the Research @ Berkeley home page: http://research.berkeley.edu, or visit the program office at 301 Campbell Hall.

The Undergraduate Research Apprentice Program (URAP) is the ideal place for students to begin to pursue their classroom learning to use. As research apprentices, students gain skills and perspectives as they assist faculty with research. Over 400 students participate in this program each year, working with faculty from more than 50 departments and colleges. Visit the URAP web site for a current list of faculty projects: http://research.berkeley.edu/urap, or come to 347 Campbell Hall, or call (510) 643-5376.

When students are ready to embark on research of their own design, they may proceed to earn and the Berkeley Beckman Scholars Program offer fellowships that allow students to pursue sophisticated research. For information about these and other programs, visit the web site at http://research.berkeley.edu/.

Lower Division Courses

C10. The Eye and Vision in a Changing Environment. (2) Two hours of lecture per week. Course covers introductory vision, the estimation of basic visual acuity in normal subjects, clinical visual disorders, and those disorders most commonly encountered in the normal population. Course is intended for health professionals. Prerequisite: Biophysics 7 or the equivalent in introductory physics. Taught by staff. [Pace, Adams]

C12. Introduction to Environmental Studies. (4) Will count toward core requirement 10 (environmental issues) for the conservation and resource studies major. Students will receive credit for C12 after taking Environmental Science, Policy, and Management 10, Environmental Science, Policy, and Management 12, or English C77. Three hours of lecture and one and one-half hours of discussion per week. This innovative course is a seminar/tutored course taught by a scientist and a humanities professor. Course explores global environmental issues; introduces students to the basic intellectual tools of environmental science; investigates the relationship between nature and philosophical traditions; and examines how science and literary analysis, scientific method, and imaginative thinking can clarify what is at stake in environmental issues and environmental citizenship. Also listed as Environ Sci, Policy, and Management 12 and English C77.

20AC. Alternative Sexual Identities and Communities in Contemporary American Society. (4) Three hours of lecture and one hour of discussion per week. An introduction to varying dimensions of alternative sexual identities in the contemporary United States, with a focus ranging from individuals to communities. This course engages students in critical inquiry into the historical, political, scientific, psychological, psychoanalytical, legal, medical, literary, and filmic materials to chart trends and movements from the turn of the century to the present. This course satisfies the American culture 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 pass/no pass basis. Freshman Seminar, 331 Campbell Hall, 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. Enrollment limited to 15 freshmen. (F,SP)

39. Freshman/Sophomore Seminar. (2-4) Course may be repeated for credit as topic varies. Priority given to freshmen and sophomores. 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 pass/no pass 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. (F,SP) [Staff]

R4AA. Topics in Western Civilization. (5) Three hours of lecture and two hours of discussion per week. Prerequisites: Completion of Subject A requirement. Formerly 444, Homeric and Classical Greece, Rome in its transition from republic to empire, and the world of the Old Testament. The course will meet in small groups for discussion. Lectures, discussions, and reading assignments will involve interdisciplinary approaches and an emphasis on the development of skill in writing. Satisfies either half of the Reading and Composition requirement. (F,SP) [Staff]

R55A. The Development of World Civilization. (5) Three hours of lecture and three hours of discussion per week. Formerly 55A. The major of the major sociocultural and cultural changes of the modern world. Consideration of various forms of human activity in major world areas before 1500: group and individual behavior, structures of belief, political forms, and economic patterns. Satisfies either half of the Reading and Composition requirement. (F) [Riegel]

R55B. The Development of World Civilization. (5) Three hours of lecture and three hours of discussion per week. Formerly 55B. An introduction to the major cultures of the world, on a broad comparative basis, since 1500. To the core ways of thinking on the process
basis. Seminars for the group study of topics not covered in classes for current topic. Must be taken on a passed/not passed basis. Formerly Freshman Sophomore Studies 79 and Interdisciplinary Studies 79. Topics change each semester. Check the schedule of classes for current topic. (F,SP)

98. Directed Group Study for Lower Division Students. (1-4) Course may be repeated for credit as topic varies. Must be taken on a passed/not passed basis. Seminars for the group study of topics not covered by regularly scheduled courses. Topics may vary from semester to semester. (F,SP)

Upper Division Courses

110. Introduction to Disability Studies. (3) Three hours of lecture per week. This course focuses on the social and personal meaning of disability and chronic illness, the history and politics of disability and conceptual models for the study of disability, the history of disabled people, bio-ethical perspectives, the depiction of disability in literature and the arts, public attitudes, and legal strategies. The course will investigate 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 may be of special interest to students 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 women's experience of disability issues, empha- sizing the social, emotional, and personal impact of chronic illness and disability on the lives which reached the media in the last decade and before, students will move toward a dynamic under- standing of the impact of a range of physical, emo- tional, and social impacts in the context of current social forces and public policy. We will explore historical perspectives as well as current trends in medicine, independent living, care-giving, insurance, public ben- efits, law, and community activism as they affect us and are affected by disabled women and girls and their families. We will discuss controversial ethical issues such as prenatal screening, wrongful birth lawsuits, and assisted suicide. Course readings will draw on the rich literature of disabled women's anthologies, biography and autobiography, scholarly and popular literature of disability, feminist analyses, creative writing, women's art, film, and theatre. (F,SP) Saxton

121. Social-Cultural Bases of Human Movement. (3) Three hours of lecture per week. Prerequisites: Sociology 1 or Anthropology 3. The social and cultural importance and structure, variety, and extent of sport in modern societies. Social factors such as institutions, power, and sport groups as subcultures. (SP) Bredemeier

126. Ethnicity, Gender, and Sexuality. (4) Three hours of lecture and one hour of discussion per week. Formerly 126. Course focuses on the production of sexualities, sexual identification, and gender differ- ence across multiple discourses and locations. Also listed as Ethnic Studies C126. (F,SP) Alarcon

C130. The Neural Basis of Thought and Language. (4) Three hours of lecture and one hour of discussion per week. This is a course on the current status of inter- disciplinary knowledge to answer the following questions: 1. How is it possible for the human brain, which is a highly structured network of neurons, to think and to learn, use, and understand language? 2. How is this information related to memory, percep- tion, motor control, and our other neural systems, including social cognition? 3. How do the computational properties of neural systems and the specific neural structures that support them shape the nature of our thoughts 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 computational models of language. Also listed as Computer Science C182, Linguistics C109, and Cognitive Science C110. Feldman, G. Lakoff

C132. Children Through History: Social Practices and Social Welfare. (4) Three hours of lecture and one hour of discussion per week. This course brings together the methods of historical analysis and the problems faced by social welfare professionals to create a new and provocative examination of children and childhood in the United States. The course will be designed to challenge students to critically examine the ways in which birth and infancy, children's rights, learning, and the state of the superlative. A significant research paper is required. Also listed as History C129. (F,SP) Fass, Matson

C133. Death, Dying, and Modern Medicine: His- torical 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 pre-meds, pre-nurses and public policy students to under- stand these matters in light of the historical and, more broadly, literary and artistic perspectives of the humanities. Also listed as History C191 and Health and Medical Sciences C133. (SP) Lago, Micco

C134. China in the 1990s: Reporting the Contra- dictions. (4) Students will receive no credit for under- graduate and Interdisciplinary Studies C134 after tak- ing Asian Studies 148, 149, and Sociology 183. Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. This interdisciplinary course applies socio- logical methods to understand the dramatic social con- sequences of the economic reforms underway in China since 1978. The course will consider the practical prob- lems of how the Chinese and American media repre- sent these developments to audiences at home and abroad. Sociological topics include change in Com- munist Party/state-society relations; decollectivization of the rural economy; ownership reform in the urban economy; and realization of the urban residence control system. Journalistic problems include how do at- tribute the findings, and how will they be used? These are questions the course will try to answer. Also listed as Sociology C183. (F,SP) Staff

C135. Visual Autobiography. (4) Six hours of lecture per week. Prerequisites: Consent of instructor. Since the 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 auto- biography. The course aims to help students become conversant with the elements of alphabetic literacy (reading and writing) and visual literacy (observing and making meaning of visual images in both textual and visual/literary forms. 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. Also listed as Course may be repeated for credit as topic varies. Three hours of lecture/discussion per week. Formerly 145. Formerly 146. This course examines interpretive issues in studying the history of sexuality and the formation of sexual identities and communities. Considering primary doc- uments, secondary literature, and theoretical essays, we investigate specific historiographical concerns and interpretive pathways in the study of sex, gender, and prac- tice. Also listed as Women's Studies C145. (F,SP) Kaplan, Marcus

C140. Cultural Representations of Sexualities: Queer Visual Culture. (4) Three hours of lecture/dis- cussion per week. Formerly 146. This course exam- ines modern visual cultures that construct ways of seeing diverse sexualities. Considering Western conventions of representation during the modern pe- riod, we will investigate film, television, and video. How and when do "normative" and "queer" sexualities be- come visually defined. Also listed as Women's Studies C146. (F,SP) Dinhshaw, Kaplan

C140A. Cultural Representations of Sexualities: Queer Literary Culture. (4) Three hours of lecture per week. Formerly 146. This course examines modern literary cultures that construct ways of seeing diverse sexualities. Con- sidering 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 Women's Studies C146A. (F,SP) Staff

C147B. Sexuality, Culture, and Colonialism. (4) Three hours of lecture per week. Formerly 147. This course focuses on textual and extra-textual representations of sexuality in the cross-cultural study of sex- uality, particularly sexual orientation and gender iden- tities. Course will stress the interaction between the sex- ualities of groups in postcolonial culture, international and local political economy and the representation and experience of what we will pro- visionally call homosexual and transgendered desires or identities. Also listed as Anthropology C147B. (F,SP)

C148. Ethnicity, Gender, and Sexuality. (4) Three hours of lecture and one hour of discussion per week. Formerly C126. Course focuses on the production of sexualities, sexual identification, and gender differ- ences across multiple cultures. Also listed as Ethnic Studies C126. (F,SP) Alarcon

189. Special Topics: Studies in Sexuality and Cul- ture. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Intensive in- troduction to a topic of sexuality and visual culture. Original research and extensive writing will be required. (F,SP)

C152. 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 se- ries to examine the history and cultural development of Judaism. It covers the biblical period and the period up to the de-struction of the second temple. This course will explore the current state of our knowledge, including the legacy of and the religious and social values, the history

prefix=language course for business majors
prefix=cross-listed course
prefix=honor's course
r prefix=course satisfies R&要求
AC suffix=course satisfies American cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

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C155. Jewish Civilization: Modern Period. (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 culture and civilization. It explores the major themes in Jewish history from 1570 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, 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 C175A and Religious Studies C134. Staff

Urban Design
(College of Environmental Design)

Office: 202 Wurster Hall, (510) 642-2965
http://www.mud.ced.berkeley.edu

Professors
Nizar AlBayyad, Ph.D. (Architecture)
Peter C. Bosselmann, M.Arch. (Architecture, City and Regional Planning, Landscape Architecture and Environmental Planning)
Harrison Frazer Jr., Dean, M.F.A., F.A.I.A. (Architecture)
Ralph Halprin, M.Arch., M.L.A. (Landscape Architecture and Environmental Planning)
Allan B. Jacobs, M.C.P. (City and Regional Planning, Landscape Architecture and Environmental Planning)
Linda L. Jewell, M.L.A. (Landscape Architecture and Environmental Planning)
Dorothy Lyndon, M.F.A., F.A.I.A. (Architecture)
Daniel Solomon, M.Arch., M.L.A. (Landscape Architecture and Environmental Planning)
Richard Bender, Ph.D. (Architecture) (Emeritus)

Associate Professors
Elizabeth Deakin, J.D., M.C.P. (City and Regional Planning)
Walter J. Hoot, Jr., M.Arch., M.L.A. (Landscape Architecture and Environmental Planning)

Program Overview
The Master of Urban Design Program is a unique, interdisciplinary program of advanced study in which exceptional architects, landscape architects, and planners holding professional degrees can participate in an intense, focused learning experience. They will share working methods, acquire additional skills, and explore new avenues of development under the supervision of an interdisciplinary group of faculty members in the College of Environmental Design drawn from the Departments of Architecture, Landscape Architecture and Environmental Planning, and City and Regional Planning.

The program addresses the need for professionals who are conversant especially with the design of varied urban areas open to public use. The activities of urban design are diverse in both type and scale. Urban designers may be concerned with settlement patterns in urbanizing areas, town layout, the restructuring of inner cities, and the design of streets and open spaces, buildings, and landscape patterns that establish neighborhoods and provide the settings for public life. They may shape the form and space of specific places such as civic or shopping centers, or they may design citywide systems such as streets, lighting, signing, greenways, or bicycle and pedestrian ways. They may work on infill in older towns and cities, or they may prepare plans, guidelines, or standards to manage extensive new development at the metropolitan growth edge.

The need for urban designers is as urgent today as in any period of recent history. Worldwide the cities of both developing and developed countries are struggling with problems of managing rapid growth. Urban design professionals are as necessary in cities of developing countries where infrastructure and land use patterns are being established as in developed cities, where historical continuity and the reuse of existing sites are major issues. A need exists for designers who are able to work effectively in teams across a large range of scales and with a well-developed understanding of urban places and the interdependencies of the fabric of buildings, landscapes and public ways, and the social interactions that shape them.

Information on the program and degree requirements is available from the Graduate Office in 202 Wurster Hall, (510) 642-2965, or at http://www.mud.ced.berkeley.edu.

For information on courses specifically designed for the Master of Urban Design Program, please see the descriptions for ED 201, ED 251, and ED 252 in the Environmental Design catalog.

Urban design also may be pursued as a concentration in the master's degree programs in the Departments of Architecture, Landscape Architecture and Environmental Planning, and City and Regional Planning. A concentration in urban design offering both the M.L.A. and M.C.P. is also offered in Landscape Architecture and City and Regional Planning. Please refer to these departments for further information.

Women’s Studies
(College of Letters and Science)

Department Office: 3326 Dwel-llle Hall #1070, (510) 642-4047
http://socrates.berkeley.edu/

Director: Carren Kaplan, Ph.D.

Professors
Norma Alarcón, Ph.D. University of Indiana. Latin American, Chicano, and Puerto Rican literature; creative writing; contemporary Chicano literature.


Evelyn Nakano Glenn, Ph.D. Harvard University. Women of color in the U.S., women, work, and technology; comparative studies of race and gender.

Associate Professor
Carolyn Porter, Ph.D. American literature, American intellectual history (English)

Irene Tinker, Ph.D. (Emerita)

Associate Professor
Karen Kaplan, Ph.D. University of California, Santa Cruz. Feminist theory, colonial and post-colonial discourses, cultural studies of travel, diaspora, and immigration; gender and globalization; transnational feminist critical practices.

Department Overview
By addressing women as social subjects and introducing the topic of gender into serious academic inquiry, Women’s studies advances new ways of thinking about society, culture, politics, language, ethics, and knowledge. It seeks to describe the diverse experiences of women throughout history, across cultures, and from different economic, ethnic, and racial groups. It deals with the question of gender itself, examining notions of sexuality and sexual difference; issues of inequality and conflict arising from gendered statuses; and the ongoing transformation of gender relations in today's global
Further Information

For further information, see the Schedule of Classes and the department's course descriptions issued before the start of each semester. The department's current course list, "Women and Gender," provides detailed, up-to-date information about courses offered by the Women's Studies Department.

For information on the designated emphasis in women, gender, and sexuality, please call (510) 643-3040.

For further information about the department, events, and links to other sites of interest, visit our Web site at http://socrates.berkeley.edu/~4047.

Lower Division Courses

R1B. Reading and Composition. (4) Three hours of lecture and one hour of discussion per week. Formerly 18. Training and instruction in expository writing in conjunction with reading literature. The readings and assignments will focus on issues relevant to women and gender. This course satisfies the second half of the Reading and Composition requirement. (SP) Staff

10. Introduction to Women's Studies. (4) Three hours of lecture/discussion per week. Introduction to Women's Studies as an academic discipline and to the feminist movement. Students will examine the development of feminist theories from the 18th and 19th centuries to contemporary times. The development of feminist theories is treated in relation to pertinent social, political, and cultural theories. (F,SP) Staff

C15. Geographies of Race and Gender. (4) Three hours of lecture and one hour of mandatory discussion per week. What can geography contribute to our understanding of gender inequality and racial discrimination in a globalizing world? The course examines (a) how supposedly “natural” differences are actually produced through everyday practices in particular spatial contexts; (b) how gender and race intersect in the U.S. in relation to those in other parts of the world, including South Africa; and (c) how these concepts and comparative historical geographies can help us to understand important questions of social change in the face of globalization. Also listed as African American Studies C15 and Geography C15.

20. Introduction to Feminist Theory. (4) Four hours of lecture/discussion per week. An introduction to feminist theories from the 18th and 19th centuries to contemporary times. The development of feminist theories is treated in relation to pertinent social, political, and cultural theories. (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 Berkeley Seminar Program has been designed to introduce students to the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminaries are offered in all campus departments, and topics vary from department to department and semester to semester. (SP) Staff

39. Lower Division Seminar in Women's Studies. Course may be repeated for credit as topic varies. 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. An introduction to feminist theories through the examination of a single problem area. Past courses have focused on urban life, work, food and literature—all viewed through the lens of gender. (F,SP) Staff

40. Special Topics. (3) Course may be repeated for credit. Three hours of lecture per week. The findings of feminist scholarship as they apply to a particular problem, field, or existing discipline. Designed primarily for lower division students and non-majors. Topics vary from semester to semester. Students should consult the Women's Studies announcement of courses for specific semester topics. (F,SP) Staff

50. Gender and Popular Culture. (3) Course may be repeated for credit. Three hours of lecture per week. A multi-disciplinary course designed to provide students with an opportunity to work with faculty investigating the topic gender and popular culture. (F,SP) Staff

50AC. Gender in American Culture. (3) Course may be repeated for credit. Three hours of lecture per week. A multi-disciplinary course designed to provide students with an opportunity to work with faculty investigating the topic gender in American Culture. This course satisfies the Women's Studies requirement. (F,SP) Staff

96. Directed Group Study for Undergraduates. (1-4) Course may be repeated for credit. Three hours of lecture per week. A multi-disciplinary course designed to provide students with an opportunity to work with faculty investigating the topic gender in American Culture. This course satisfies the Women's Studies requirement. (F,SP) Staff

99. Supervised Independent Study and Research. (1-4) 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. 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. This course is 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

101. Representations of Gender. (4) Three hours of lecture/discussion per week. The goal of this course is to introduce fundamental critical terms and models for understanding both how gender, race, and sexuality are constructed/reconstructed through representation, and what these can offer us as an arena to construct varied forms of representation. Forms of representations might include science, history, politics, philosophy, literature, cinema, and other visual arts. (F) Staff

102. Comparative Structures of Gender. (4) Three hours of lecture/discussion per week. The goal of this course is to analyze, through cross-cultural and historical case studies, the systematic but variable ways gender, race, and sexuality structure social life. Attention will be given to social, political, economic, and legal institutions. (SP) Staff

103. Identities Across Difference. (4) Three hours of lecture per week. Prerequisites: 10. The course studies identity as a product of articulation and investigation of self and other, rather than an inherited marking. Emphasis on analysis, for example, may be placed on the complexity of the lived experiences of women of color in the United States and in diverse parts of the world. (F) Staff

104. Advanced Feminist Theory. (4) Four hours of lecture/discussion per week. A course in 20th century feminist theory, focusing on the theories of women, gender and sexuality in relation to race, class, and culture. (SP) Staff

111. Special Topics. (1-4) Course may be repeated for credit as topic varies. One to three hours of lecture/discussion per week. This course is designed to provide students with an opportunity to work closely with Women's Studies faculty, investigating a topic of mutual interest in great depth. Emphasis on student direction and collaboration. Topics will vary from semester to semester. Number of units will depend on specific course, format, and requirements. (F,SP) Staff

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. To be admitted to the minor in women's studies, students must complete WS 10, WS 20 or their equivalent beforehand.

Prerequisites for Nonmajors and Minors

Students who are not majoring or minoring in women's studies but wish to take women's studies core courses (101, 102, 103, and 104) must take WS 10, WS 20 or their equivalent beforehand.
120. The History of American Women. (4) Three hours of lecture per week. This course will survey the history of women in the United States from approximately 1800 to the present, a century of dramatic and fundamental change in the meaning of gender. The course will explore the experiences of women in different professions and in different economic situations, and the ways in which these have changed over time. The course will also consider the role of women in the development of the natural sciences and the impact of development programs and modernization, including the image of the African American woman in contemporary African American literature. Also listed as African American Studies C146A. (F,SP) Staff

125. Women in Film. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 10 or the equivalent. Formerly 100. This course explores feminist approaches to women's experiences of paid and unpaid labor in the household and the market. Historical, anthropological, economic, and sociological perspectives are brought to bear on such issues as history, race, nation, and sexuality, in the content and location of women's work; wage inequities and occupational segregation; sexual harassment; individual resistance strategies and collective organizing; class and race differences in women's work; state and social policy affecting work and family life. (F,SP) Staff

130. Gender and Science. (3) Three hours of lecture/discussion per week. This course will focus on the way women are represented in the scientific and technological practices. (F,SP)

136. Immigrant Women. (4) Three hours of lecture per week. Prerequisites: Upper division standing and consent of instructor. This course will examine patterns of women's immigration to the U.S. in the context and location of women's work; wage inequities and occupational segregation; sexual harassment; individual resistance strategies and collective organizing; class and race differences in women's work; state and social policy affecting work and family life. (F,SP) Glenn

140. Feminist Cultural Studies. (4) Three hours of lecture per week. This course introduces students to the interdisciplinary field of feminist cultural studies. Drawing upon contemporary theories of representation, the specific focus of the course will vary, but the emphasis will remain on the intersections of gender, race, nation, sexuality, and class in particular cultural and critical practices. (F,SP) Kaplan

141. Women and World Development. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Reading and composition requirement. This course will examine patterns of women's participation in the development of the natural sciences and the impact of development programs and modernization, including the image of the African American woman in contemporary African American literature. Also listed as African American Studies C153A. (F)

143. 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. This course will examine patterns of women's participation in the development of the natural sciences and the impact of development programs and modernization, including the image of the African American woman in contemporary African American literature. Also listed as African American Studies C153B. (SP)

195. Senior Seminar. (4) Three hours of seminar per week. Prerequisites: women's studies majors. This seminar is required for all seniors majoring in women's studies and is open only to them. The goal of the course is for students to produce a research paper of 25-30 pages that reflect feminist methods, interpretations, or analysis. (F) Staff

H195. Women's Studies Senior Honors Thesis. (4) Individual conferences. Prerequisites: 15 upper division units in Women's Studies; 3.3 GPA in all University courses and GPA of 3.5 or better in details writing a bachelor's honors thesis pertaining to the student's major in Women's Studies. Each student will work under the guidance of a faculty adviser who will read and grade the thesis. (F,SP) Staff

C196W. Special Field Research. (10.5) 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. This course will examine patterns of women's participation in the development of the natural sciences and the impact of development programs approved in advance by the faculty coordinator and for which written contracts have been established between the sponsoring organization and the student. Students may be required 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 no fewer than 35 pages of text. Other arrangements: see faculty adviser. Also listed as History of Art C196W, Undergraduate Interdisciplinary Studies C196W, Mass Communications C196W, Political Science C196W, History C196W, Political Economy of Industrial Soc C196W, and Sociology C196W.

197. Internship. (2-4) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Women's Studies major. Seminars for the group study of selected topics not covered by regularly scheduled courses. Topics will vary from year to year. (F,SP) Staff

198. Supervised Independent Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Women's Studies major. Reading and conference with the instructor in a field that shall not coincide with that of any regular course and shall be specific enough to enable the student to write an essay based upon the student's study. (F,SP) Staff

Graduate Courses

200. Theory and Critical Research. (4) Two to three hours of seminar per week. Prerequisites: Consent of instructor, 104, or the equivalent. This course will provide an opportunity for the examination of diverse feminist theoretical frameworks produced in and across disciplines. The course will ground contemporary philosophical and theoretical developments in the study of gender to specific histories of class, race, sexuality, and nation, and sexuality. Participants in the course will be required to draw upon their own disciplinary and interdisciplinary backgrounds and interests to produce multifaceted analyses of how feminist theory has been developed and used in and across disciplines. The course will build both theoretical and practical knowledge in organizing and leading class discussion on a rotating basis. (F,SP) Staff

210. Advanced Interdisciplinary Studies. (4) Three hours of lecture and one hour of seminar per week. Prerequisites: 104 or equivalent and consent of instructor. This course will examine patterns of women's participation in the development of the natural sciences and the impact of development programs and modernization, including the image of the African American woman in contemporary African American literature. Also listed as African American Studies C153A. (F)

216. Sex and Social Change. (4) Three hours of lecture per week. Prerequisites: upper division standing and consent of instructor. This course will examine patterns of women's participation in the development of the natural sciences and the impact of development programs and modernization, including the image of the African American woman in contemporary African American literature. Also listed as African American Studies C153B. (SP)

230. Women and World Development. (4) Three hours of lecture and one hour of seminar per week. Prerequisites: Reading and composition requirement. This course will examine patterns of women's participation in the development of the natural sciences and the impact of development programs and modernization, including the image of the African American woman in contemporary African American literature. Also listed as African American Studies C153A. (F)

239. Women and Work. (4) Three hours of lecture per week. This course will examine patterns of women's participation in the development of the natural sciences and the impact of development programs and modernization, including the image of the African American woman in contemporary African American literature. Also listed as African American Studies C153B. (SP)

240. Feminist Cultural Studies. (4) Three hours of lecture and one hour of seminar per week. This course introduces students to the interdisciplinary field of feminist cultural studies. Drawing upon contemporary theories of representational politics, the specific focus of the course will vary, but the emphasis will remain on...
the intersections of gender, race, nation, sexuality, and class in particular cultural and critical practices. Graduate students research and write a substantial (25-50 page) paper for the course. They also participate in organizing and leading class discussions on a rotating basis. (F,SP) Kaplan

241. Women and World Development. (4) Three hours of lecture and one hour of seminar per week. Prerequisites: Consent of instructor. This course will examine women's lives in developing countries and the impact of development programs and modernization, women as rural and subsistence urban micro-entrepreneurs, and the efforts of the women's movement to change both the theory and practice of development. (F,SP) Tinker

299. Individual Study and Research. (1-9) Course may be repeated for credit. Regular meetings to be arranged with instructor. Prerequisites: Consent of instructor. For students engaged in individual research and study. May not be substituted for available graduate lecture courses. (F,SP) Staff

Wood Science and Technology
(College of Natural Resources, Interdisciplinary Graduate Group)

Office: Building 478, Richmond Field Station, (510) 215-4250
Chair: Frank C. Beall, Ph.D.

Professors
Frank C. Beall, Ph.D. (Environmental Science, Policy, and Management; Forest Products Laboratory)
Harvey W. Blanch, Ph.D. (Chemical Engineering)
David A. Dornfeld, Ph.D. (Mechanical Engineering)
Don J. Durzan, Ph.D. (Environmental Horticulture; University of California, Davis)
Bruce Hartsook, Ph.D. (Biological and Agricultural Engineering; University of California, Davis)
You-Lo Hsieh, Ph.D. (Textiles and Clothing; University of California, Davis)
Bryan M. Jenkins, Ph.D. (Biological and Agricultural Engineering; University of California, Davis)
George C. Johnson, Ph.D. (Mechanical Engineering)
Fai Ma, Ph.D. (Mechanical Engineering)
Jeffrey M. Romm, Ph.D. (Environmental Science, Policy, and Management)
Robert B. Williamson, Ph.D. (Civil and Environmental Engineering; Forest Products Laboratory)
David L. Brink (Emeritus), Ph.D. (Environmental Science, Policy, and Management; Forest Products Laboratory)
William McKittrick (Emeritus), Ph.D. (Environmental Science, Policy, and Management; Forest Products Laboratory)
Arno Schniewind (Emeritus), Ph.D. (Environmental Science, Policy, and Management; Forest Products Laboratory)
Wayne Wilcox (Emeritus), Ph.D. (Environmental Science, Policy, and Management; Forest Products Laboratory)
Charles B. Wilke (Emeritus), Ph.D. (Chemistry, Chemical Engineering)
You-Lo Hsieh (Emeritus), Ph.D. (Environmental Science, Policy, and Management; Forest Products Laboratory)

Associate Professors
Richard S. Dodd, Ph.D. (Environmental Science, Policy, and Management; Forest Products Laboratory)
James W. Rector III, Ph.D. (Materials Science and Engineering)

Graduate Adviser: Mr. Beall.

Program Overview

This program is administered by an intercampus, interdisciplinary group drawn from faculties in chemistry, engineering, forestry, and other related departments at UC Berkeley and UC Davis. It offers programs leading to the M.S. and Ph.D. degrees. These programs are directed particularly to students desiring a thorough knowledge of all areas of wood science as a background to their chosen research fields or areas of specialization. Graduate study develops an understanding of the ultrastructure, physics, and chemistry of wood. Specialization through additional study and thesis research under the program is possible in broad areas related to wood-based materials in structures, including nondestructive evaluation, seismic performance, biodegradation of materials, and fire performance, and in biobased materials, including use of woody biomass, conversion of urban waste ma-

terials, improvements in secondary processing, and biochemical processing. Graduate courses are listed under the Department of Environmental Science, Policy, and Management, beginning with ESPM 286.

The excellent facilities of the Forest Products Laboratory are available for both thesis and special research projects. To be considered for admission, students must have a degree in a natural science, forestry, engineering, wood science/technology, or related fields, and meet the criteria for admissions by the Graduate Division. For further information, consult www.ucfpl.ucop.edu.