Courses and Curricula
Aerospace Studies
(Air Force ROTC)

(See Military Officers' Education Program)

Afro-American Studies
(College of Letters and Science)

Department Office: 3335 Dwinelle Hall, 642-7084

Professors:
William M. Banks, III, Ed.D. University of Kentucky.
Barbara Christian, Ph.D. Columbia University. Women writers, feminist criticism
Reginald Jones, Ph.D. Ohio State University. Black psychology, special education
June Jordan, poetry and essay
Michel B. Laguerre, Ph.D. University of Illinois. Caribbean anthropology
Margaret B. Wilkinson, Ph.D. University of California at Berkeley. Black theatre, Lorraine Hansberry

Associate Professors:
Vivian Clark, Ph.D. University of California at Berkeley. Francophone and Anglophone literature of Africa and the Caribbean
Charles Henry, Ph.D. University of Chicago. Black politics, public policy
Perry H. Hobbs, Ph.D. Yale University. Political sociology, social change

Lecturers:
Albert J. Johnson, Ph.D. University of California, Los Angeles. English
Stanford Robinson, M.Div. San Francisco Theological Seminary
Roy T. Thomas, M.A. New York University. Afro-American Studies
Greg Thomson, M.A. Harvard University. Sociology and psychology

Overview of Curriculum

The Department of Afro-American Studies offers students a bachelor of arts degree as well as a minor in Afro-American studies. Majors declare an area of concentration in either the social sciences or the humanities. Social science students learn about cultural, political, social, and economic factors that have an impact upon African American life as well as approaches to the study of poverty and deprivation in the African Diaspora. The humanities concentration affirms the literature and cultural arts as integral to the intellectual formulations about the legacy and future of African Americans. History, literature, and the performing arts form the core of the humanities.

The curriculum is intended to offer students, both majors and nonmajors, breadth in the humanities and social sciences. There are six basic courses, 1A and 1B are freshman composition courses which use African American literature and issues in the teaching of writing. The 4A and 4B courses offer students a general background in African American life and culture from precolonial time to the present. The 5A and 55 courses offer students a general multidisciplinary background in African American life and culture from humanities

In each of the number series, the course ending with 9 (e.g., 159) is designed for Selected Topics. This arrangement allows teachers and students to investigate a specific topic of importance which may not be essential to the curriculum and may not be permanently included in it.

Requirements for Major: Social Science Concentration

I. Lower Division.
A. AAS 4A-4B: Africa: History and Culture.
B. AAS 5A-5B: Black Life and Culture in the United States.

II. Upper Division.
B. Any one of the following comparative courses:
   (1) AAS 111: Race, Class and Gender: Comparative Social Change in the United States; (2) AAS 112A and AAS 112B, Political and Economic Development in the Third World; (3) AAS 113: Race, Ideology and Economics: A Comparative Approach to Afro-American Communities and Cultures; (4) AAS 135: Caribbean Cultural History.
C. Any three of the following topical or discipline-oriented courses:
   (1) AAS 107: Race and Public Policy; (2) AAS 110A-110B: Afro-American Economic History; (3) AAS 121: Black Political Life; (4) AAS 122: Black Family; (5) AAS 123: Black Church; (6) AAS 124: Political Philosophy of Martin Luther King, Jr.; (7) AAS 126: Education and Inequality; (8) AAS 132A: Psychology and Black People; (9) AAS 137: Urban Afro-Africa; (10) AAS 144; Religion and Culture in Black America.
E. Majors must complete the senior thesis requirement AAS 192A-192B.

Requirements for Major: Humanities Concentration

I. Lower Division.
A. AAS 4A-4B: Africa: History and Culture.
B. AAS 5A and 5B: Black Life and Culture in the United States.

II. Upper Division.
B. Any two of the following:
   (1) AAS 150A: Survey of Black American Literature 1746-1920; (2) AAS 150B: Survey of Black American Literature 1920-Present; (3) AAS 151A: Black American Plays from 1858 to 1959; AAS 151B: Contemporary Black American Plays 1959 to present.
C. Any one of the following sequence:
D. Any three of the following area courses:
   (1) AAS 130: Afro-American Societies and Cultures; (2) AAS 131: Afro-American Discourse of African-American Literature; (3) AAS 143B: Performance of Afro-American Drama; (4) AAS 143C: Black Theater Workshop; (5) AAS 153A: Images of Black Women in Literature; (6) AAS 153B: Contemporary Images of Black Women in Literature; (7) AAS 154: History of Black People Around the World Through Literature; (8) AAS 155: Literature of the Caribbean; (9) AAS 156: Literature of Black Africa; (10) AAS 123: Afro-American Religion: Historical Perspectives; (11) AAS 144: Religion and Culture in Black America; (12) AAS 131: Caribbean Societies and Cultures; (13) AAS 141: Black Art in the New World; (14) Music 130: Afro-American Music; (15) AAS 142A: Third World Cinema; AAS 142B: Black Americans in the World of Cinema; 142C: Scenario and Film Criticism.
E. Majors must complete one of the Afro-American Studies literature courses with a limited or specialized focus, i.e., concentrating on a basic theme, or a study of not more than two authors simultaneously.
F. Majors must complete the senior thesis requirement AAS 192A-192B.

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 3.30 or higher in all University work, as well as a 3.50 GPA or higher in the Afro-American Studies major. Students in the program must complete two consecutive semesters of Afro-American Studies H159A-H159B under the supervision of a faculty member, culminating in the completion of a senior honors thesis or equivalent project.

Afro-American Studies Minors

Students in the College of Letters and Science may declare one or more minors of their choice, normally in a field both academically and administratively distinct from their major.

The Afro-American Studies Department offers minors in the same areas of concentration as the majors, Humanities and Social Science. Requirements for each area of concentration follow.

One lower division Afro-American studies course and five upper division courses are required. Students must complete at least three of the upper division courses from within the department. 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 with sound educational reasons may petition for acceptance of other Afro-American studies upper division courses as part of the minor. Students may also petition to have transfer credits accepted, but transfer students must take the minimum of three upper division courses from this department.

Afro-American Studies Humanities Minor

A. One of the following: AAS 4A, 4B, 5A or 5B
B. Five courses from the following:
   (1) One of the AAS history courses: AAS 116, Colonialism, Slavery and Afro-American Life Before 1865; or AAS 117: Afro-Americans in the Industrial Age, 1865-1970; (2) One of the Survey courses: AAS 150A, 150B, or 151, 150A, Afro-American Literature from 1746-1920; 152A, Afro-American Literature from 1920-present; 153A: Black American Plays from 1858 to 1959; AAS 151B: Contemporary Black American Plays 1959 to present.
C. Any one of the following sequence:
D. Any three of the following area courses:
   (1) AAS 130: Afro-American Societies and Cultures; (2) AAS 131: Afro-American Discourse of African-American Literature; (3) AAS 143B: Performance of Afro-American Drama; (4) AAS 143C: Black Theater Workshop; (5) AAS 153A: Images of Black Women in Literature; (6) AAS 153B: Contemporary Images of Black Women in Literature; (7) AAS 154: History of Black People Around the World Through Literature; (8) AAS 155: Literature of the Caribbean; (9) AAS 156: Literature of Black Africa; (10) AAS 123: Afro-American Religion: Historical Perspectives; (11) AAS 144: Religion and Culture in Black America; (12) AAS 131: Caribbean Societies and Cultures; (13) AAS 141: Black Art in the New World; (14) Music 130: Afro-American Music; (15) AAS 142A: Third World Cinema; AAS 142B: Black Americans in the World of Cinema; 142C: Scenario and Film Criticism.

Afro-American Studies Social Science Minor

One of the following: AAS 4A, 4B, 5A or 5B.Five courses from the following: AAS 107, Race and Public Policy; AAS 112A or 112B, Political and Economic Development in the Third World; AAS 116, Colonialism, Slavery and Afro-American Life Before 1865 (or) AAS 117, Afro-Americans in the
Industrial Age, 1865-1970: AAS 121, Black Political Life in the U.S.; AAS 122, Black Families in American Society; AAS 123, Afro-American Religious Institutions; AAS 124, Afro-American Political Philosophy of Martin Luther King, Jr.: AAS 126, Education and Inequality in American Society; AAS 130, Afro-American Communities and Cultures; AAS 132, Caribbean Societies and Cultures; AAS 132, Paying for Public Policy; AAS 144, Religion and Culture in Black America.

Lower Division Courses

1A. Freshman Composition. (4) Three hours of lecture, plus one hour discussion per week. Prerequisites: Subject A and 1A. Continued training in expository, argumentative, and other styles of writing. The assignments will focus on themes and issues in African American life and culture. (F,SP) Staff

1B. Freshman Composition. (4) Three hours of lecture, plus one hour discussion per week. Prerequisites: Subject A and 1A. Continued training in expository, argumentative, and other styles of writing, with more emphasis on literary interpretation. (F,SP) Staff

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

4B. Africa: History and Culture. (4) Three hours of lecture, plus one hour discussion per week. Emphasis on social, political, and economic change in 20th century Africa; with further emphasis upon the roles of modernization, urbanization, and the emergence of contemporary African states. (SP)

5A. Black Life and Culture in the United States. (4) Three hours of lecture, plus one hour discussion per week. A study of the genesis, development, and scope of Black culture, approached through an examination of basic forms of cultural expression, historical themes, and intercultural currents. (F,SP) Staff

5B. Black Life and Culture in the United States. (4) Three hours of lecture, plus one hour discussion per week. Emphasis on the social experience of African Americans, as an explanatory approach, designed to help students understand the forces and ideas that are influencing the individual and collective Black experience. (F,SP) Banks

20. Introduction to Afro-American Social Institutions. (3) Three hours of lecture per week. Prerequisite: Consent of instructor. This course in sociology of the Black community is designed to introduce students to the major concepts, themes, and problems of African-American society. (F,SP) Staff

25. 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 Blacks. Interdisciplinary in approach, the course will reveal the complexities of gender, class and race in the social quilt of America. (F,SP) Banks

39. Seminar for Lower Division Students. (2-4) Course may be repeated once for credit with a different instructor. One 2 or 3 hour lecture and one hour conference per week. Prerequisite: Consent of instructor. Seminars on various topics in Afro-American studies designed to introduce beginning undergraduates to the methods and approaches of the discipline. Work in the course will typically include class reports and a research paper. (F,SP) Staff

98. Directed Group Studies for Freshmen and Sophomores. (1-4) Supervised research. Must be taken on a passed/not passed basis. Supervised research on specific topics related to Afro-American Studies. (F,SP)

99. Directed Group Studies for Freshmen and Sophomores. (1-4) Supervised research. Must be taken on a passed/not passed basis. Supervised research on specific topics related to Afro-American Studies. (F,SP)

Upper Division Courses

101A. Research Methods for Afro-American Studies. (3) Three hours of lecture per week. An introduction to the various aspects of social science research methods, their application and misapplication, using the study of race relations in the U.S.A. as a backdrop. Emphasis on the qualitative and quantitative research designs. (F) Jones

101B. Research Methods for Afro-American Studies. (3) Three hours of lecture per week. Prerequisites: 101A or introductory statistics. Introduction to quantitative research methods with a special emphasis on research techniques and procedures. Introduction to punchcard data processing using S.P.S.S. computer package program. (SP) Hintzen

107. Race and Public Policy. (3) Two 1/2 hour lectures 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. (SP) Henry

110A. Afro-American Economic History. (3) Three hours of lecture per week. Prerequisites: Afro-American history and/or introductory economic history. Three hours of lecture per week. Prerequisites: Afro-American history and/or introductory economic history are strongly recommended. Emphasis on issues influencing the development of a black economic base in the United States from 1819-1918. (F,SP) Hintzen

110B. Afro-American Economic History. (3) Three hours of lecture per week. Prerequisites: Afro-American history and/or introductory economic history are strongly recommended. Emphasis on issues influencing the development of a black economic base in the United States from 1819 to present. (SP) Hintzen

111. Race, Class, and Gender in the United States. (3) Three hours of lecture per week. Prerequisites: Readings and research 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. (SP) Staff

112A. Political and Economic Development in the Third World. (3) Three hours of lecture per week. An examination of the structural and actual manifestations of Third World underdevelopment and the broad spectrum of theoretical positions put forward to explain it. Historical and current analysis from both the international and intranational perspective. (F) Hintzen

112B. Political and Economic Development in the Third World. (3) Three hours of lecture per week. A critical appraisal of the theoretically based policies employed by Third World nations in their attempts at transition to modern politics and economics systems and an examination of the international and intra-national impediments to Third World development. The focus will be on actual examples that represent the diversity of developing countries. (SP) Banks

113. Race, Ideology, and Economics in Africa and Afro-America. (3) Three hours of lecture per week. Prerequisites: Lower division course in economics. Emphasis on the relationship of the rise of racism as a systematic ideology in the eighteenth and nineteenth century European and slave economies in Africa and the New World; including quantitative analysis. (F) Hintzen

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

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

118. Afro-American Urban History—A Survey. (4) Three hours of lecture and one hour discussion per week. This course will examine the roots of African American urban life, the changes which occurred after the Civil War, the reasons for the changes, and the consequences of the changes. (SP)

119. Selected Topics in the Socio-Historical Development of the Black World. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Determined by offering. (F,SP)

121. Black Political Life in the United States. (3) Three hours of lecture per week. Prerequisites: 5B or 117 or 110A. An analysis of the theoretical and historical development of African Americans' political forms and expression. Examination of local, state and federal political processes and activities, and the development of black political ideologies, organizations, and movements. (F) Hesser

122. Black Families in American Society. (3) Three hours of lecture per week. Prerequisites: 5B or 120 or introductory course in sociology. Examines the historical roles and functions of families in the development of black people in America from slavery to the present. (SP)

123. Afro-American Religion: Historical Perspectives. (3) Three hours of lecture per week. Survey of the religious life of African Americans from the transmission of African religious beliefs during slavery to the present day Black church. Topics include: religious beliefs of the slave community, the rise of independent Black denominations, the role of demography, and the church in political and social struggles. (SP)

124. Political Philosophy of Martin Luther King, Jr. (3) Two 1/2 hour lectures per week. Using the thought and actions of Martin Luther King, this course examines major events of the Civil Rights Movement. Reading includes original works by King as well as secondary sources with a special emphasis on Black religious, non-violence and integration. (SP) Henry

125. Law and the Black Community in the United States. (3) Three hours of lecture per week. Prerequisites: 5B or 120 or History 125A-125B. Examination of the legal decisions and processes that have affected or continue to affect the status of blacks in America. Attention given to the criminal process, including the police, district attorney, trial courts, and Grand Jury. (SP)

126. Education and Inequality in American Society. (3) Three hours of lecture per week. Examination of the evolution and function of public schools as an American institution. Focus on the policies and the practices which have affected the education of Black students. Emphasis on the relationship between education and inequality. (SP) Jones

130. Afro-American Communities and Cultures. (3) Three hours of lecture per week. Comparative analysis of the cultural and social organization of African American communities in the United States, Latin America and the Caribbean. Emphasis on folk institutions, family organization, religious behaviors and socio-economic adaptation. (SP)

131. Caribbean Societies and Cultures. (3) Three hours of lecture per week. Comparative study of Spanish, Dutch, English, and French-speaking Caribbean societies and communities focusing on the historical development of the plantation system, urban dynamics, ethnic politics, family structures, and ecologies of Afro-Caribbean religions. (SP) Laguerre

132. Psychology and Black People: Current Issues. (3) Three hours of lecture per week. Prerequisites: 101A or upper division course in psychology. Examines psychological research and theory pertaining to Black people. Emphasis on understanding the concerns, methods, and conclusions reached by African American psychologists. Emphasis on psychology from its origins to the present. (SP)

133. Black Children and Youth: Psychological Development. (3) Three hours of lecture per week. Prerequisites: 132 or upper division course in psychology.

*Not offered 1991-92

*On leave, spring, fall

*On leave, fall

*Recipient of Distinguished Teaching Award
Examination of the growth and development of the Black child through adolescence. Jones

135. Caribbean Cultural History. (3) Three hours of lecture per week. An 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 Afro-Caribbean cultural institutions and practices, immigration of Chinese, East Indians, Lebanese, and Canaries into the West Indies during the post-emancipation period, political history, and the historical and structural evolution of the societies. (F) Laguerre

*136. Health, Medicine, and Culture. (3) Three hours of lecture per week. Examination of theoretical issues in medical anthropology. Comparative analysis of the evolution of African American and Caribbean medical traditions. Emphasis on ethno-medicine, ethno-philosophy, ethnopharmacology, ethnicity, and medical care. (F)

137. Urban Afro-America. (3) One three hour seminar per week. Examination of theoretical issues in urban anthropology. Comparative analysis of the ecology and social structure of Caribbean urban communities with special emphasis on urban history, social class, urban marginality, urban ethnicity, and urban cultures. (F)

138. Black Nationalism. (3) Three 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 Black religions and the attempt to develop "Black socialism." (F) Henry

139. Selected Topics of Afro-American Social Organization and Institutions. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Determined by offering. (SP) Staff

*141. Black Art in New World. (3) Three hours of lecture per week. Study of the visual art forms of black people in the new world with special attention given to African influences. (F)

142A. Third World Cinema. (3) Two 11/2-hour lectures, plus two hours viewing discussion per week. Prerequisites: Reading and composition requirement. Examines through lectures and a selection of films, the development and achievements of Third World motion picture artistry. Social, political, and cultural themes are discussed, with particular emphasis given to major works from Asia, Africa, and Latin America. Other newly-developed film sources from abroad are presented for critical assessment. (F) Johnson

142B. Black Americans in the World of Cinema. (3) Three hours of lecture and discussion per week. Prerequisites: Reading and composition requirement. A critical, historical approach to the image of Black Americans in the film industry, from 1915 to the present. The early work of Black film producers and directors, and the gradual shift from the boundaries of censorship to contemporary realism embody the substance of the course. The use and misuse of ethnic characters are explored. Film makers and artists are sometimes present for discussion. (F) Johnson

142C. Scenario and Film Criticism. (3) Three hours of lecture and discussion per week. Prerequisites: Completion of reading and composition requirement, plus 432B or equivalent. The development of scenario and critical writing for motion pictures, with special 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. (F) Johnson

143A. Performance of Afro-American Literature. (3) Three hours of lecture per week. Prerequisites: 1A or consent of instructor. Introduction to dramatic performance as a way of knowing and understanding the oral dimensions of African American literature. Selections and assignments include poetry, essays, and excerpts from plays. (F) Wilkerson

143B. Performance of Afro-American Drama. (3) Three hours of lectures per week. Prerequisites: 134A or equivalent or consent of instructor. Development of performance skills as a way of learning and understanding African American drama. (SP) Wilkerson

143C. Black Theatre Workshop. (3) Three hours of lecture per week. Prerequisites: 143A 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. (SP)

144. Religion and Culture in Black America. (4) Three hours of lecture and one hour discussion per week. Prerequisites: 5. An investigation of the varied social and cultural forms of Black religious life in America. Approached through history, sociology, folklore, music, theology, and literature. (SP)

150A. Black American Literature 1746-1920. (3) Three hours of lecture per week. Introduces the early literary creations and thought of Black America through examination of written and oral expression: poetry, essays, sermons, spirituals, slave narratives, letters, folklore, fables, novels, etc. (F)

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

151A. Black American Plays from 1859 to 1959. (3) Three hours of lecture per week. Prerequisites: Reading and composition requirement. Historical survey of plays by Black American writers and the portrayal of the Black experience in American theatre. Emphasis on predominant themes, structural tendencies, socio-historical context. (F)

151B. Contemporary Black American Plays 1959 to Present. (3) Three hours of lecture per week. Prerequisites: 151A or consent of instructor. Survey of contemporary plays by Black American writers and the portrayal of the Black experience in American theatre. Emphasis on predominant themes, structural tendencies, socio-historical context. (SP) Christian

152A. Black 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 of the craft of writing in relation to the various genres. Course changes frequently by focus upon a specific genre. (F)

152B. Black American Poetry: The Nature and Traditions. (3) Three hours of lecture per week. Prerequisites: Reading and composition requirement. Analysis and discussion of the development of poetic styles, and forms in poetry by Black Americans. (SP)

*152C. Black American Dramatic Literature: Forms and Styles. (3) Three hours of lecture/labatory sessions per week. Introduction to analysis with emphasis on the primary theatrical form of styles chosen by Black playwrights and the thematic consequences of those choices. Plays will be analyzed both as literature and as theatrical production; e.g., laboratory will include attendance at plays and performance of plays. (F)

152D. Black American Short Stories. (3) Three hours of lecture per week. Prerequisites: Reading and composition requirement. Analysis and discussion of the development of the short story form and techniques. (F,SP) Staff

152E. Black American Novels and Narratives. (3) Three hours of lecture per week. Prerequisites: Reading and composition requirement. Analysis and discussion of the development of the Black American novel form and techniques. (SP)

153A. Black American Novels and Narratives. (3) Three hours of lecture per week. Prerequisites: Reading and composition requirement. The study and analysis of the major works of black American writers, beginning with the slave narrative and tradition. (SP)

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

154. A History of Black People Around the World Through Literature. (3) Three hours of lecture per week. Prerequisites: Reading and composition requirement. A survey of literary works produced by West Indian authors. Attention will be given to their aesthetic interests and achievements as well as to their general thematic concerns. (F) Clark

*157. Creative Writing. (3) Course may be repeated once for credit. Three hours of lecture per week. Prerequisites: Reading and composition requirement and consent of instructor. Includes study of the craft of writing in relation to the various genres. Course changes frequently by focus upon a specific genre. (F)

159. Special Topics in Black Literature. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Reading and composition requirement, plus those set by instructor. Topic will vary from year to year. (F,SP)

*161. Health, Science, and Health Delivery Systems and Minority Community. (3) Three hours of lecture per week. Prerequisites: 160 or consent of instructor. Examines the relationship between health delivery systems and the health status of black Americans. Introduction to federal, state, and local health policy; training programs; health-care organizations. (SP)

192A-192B. Senior Thesis. (3,3) Three hours tutorial per week. Prerequisites: Senior standing and two-thirds of the courses required in the major. Three units awarded for each semester's work. For departmental credit, student must attain a C grade or better in each part of the sequence. Application and details at Departmental Adviser's Office. This sequence is required for the major. (F,SP) Staff

H195A-H195B. Senior Honors Thesis. (3,3) Credit and grade to be awarded upon completion of the sequence. Prerequisites: Senior Standing and 3.3 GPA or above in major. The Senior Honors Thesis is a primary research and writing project based on study of an advanced topic undertaken through weekly appointments with a faculty sponsor. Fulfills department thesis requirement. Students must enroll for both semesters of the sequence. (F,SP) Staff

197. Field Study in Afro-American Life. (1-4) Must be taken on a passed/not passed basis. Supervised field work in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP) Staff

198. Directed Group Studies for Undergraduates. (1-4) Must be taken on a passed/not passed basis. Supervised research on a specific topic. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Must be taken on a passed/not passed basis. Enrollment is restricted by regulations listed in the General Catalog. (F,SP) Staff

Graduate Courses

299. Individual Study or Research. (1-4) Prerequisites: Consent of Instructor. Individual study or research program to be worked out with sponsoring faculty by approval by Department Chairperson. Regular meetings arranged with faculty sponsor. (F,SP) Staff
Agricultural and Environmental Chemistry

(College of Natural Resources, Interdepartmental Graduate Groups)

Office: 111E Genetics and Plant Biology Building, 642-5162
Chair: Norman Tenny, Ph.D.

Professors:
Leonard F. Bledans, Ph.D. (Nutritional Sciences)
Bob B. Buchanan, Ph.D. (Plant Biology)
John E. Casida, Ph.D. (Entomological Sciences)
Harvey E. Doner, Ph.D. (Soil Science)
John G. McColl, Ph.D. (Soil Science)
Bastias Exell, Ph.D. (Plant Biology)
William J. Olesk, Ph.D. (Public Health, BEHS)
Stephen M. Rowse, Ph.D. (Public Health, BEHS)
Norman Tenny, Ph.D. (Plant Biology)
John I. Thornton, Ph.D. (Public Health, BEHS)
Eugene Zavatin, Ph.D. (Forestry and Resource Management)

Graduate Courses

299. Research in Agricultural and Environmental Chemistry. (1-12) Course may be repeated for credit. In conjunction with an instructor. Research in agricultural and environmental sciences. In addition to the major field of specialization, the student must have completed the bachelor's degree in chemistry.

Graduate Students may be engaged in research. Graduate research is directed by a member of the group whose activities most closely coincide with the student's interests. Courses may be taken in various departments of the College of Natural Resources, the Department of Molecular and Cell Biology in the College of Letters and Science, and the College of Chemistry. The following are examples of the fields represented: insecticide and natural products chemistry in the Department of Entomological Sciences; soil chemistry in the Department of Soil Science; plant nutrition in the Department of Plant Biology; forest pathology in the Department of Forestry and Resource Management; molecular biology of food legumes; food chemistry and toxicology and animal nutrition in the Department of Nutritional Sciences. In addition to the major field of specialization, predoctoral students must take courses in chemistry, biochemistry, and allied sciences as needed to enable them to pass the qualifying examinations in agricultural and environmental chemistry.

*Graduate Courses

Agricultural and Resource Economics

(College of Natural Resources)

Department Office: 207 Giannini Hall, 642-3345
Chair: Andrew Schmitz, Ph.D.

Professors:
Ira Adelman, Ph.D. University of California at Berkeley.
International labor economics
Peter Berck, Ph.D. Massachusetts Institute of Technology.
Natural resource economics
Alain de Janvry, Ph.D. University of California at Berkeley.
International labor economics
Anthony C. Fisher, Ph.D. Columbia University. Natural resources and environmental public economics, microeconomic theory
George Judge, Ph.D. Iowa State University. Econometrics
Jeffrey Perloff, Ph.D. Massachusetts Institute of Technology. Labor, industrial organization
Gordon C. Rausser, Ph.D. University of California at Davis. Agriculture and resource policy (Robert Gordon Sproul Chair in Agricultural and Resource Economics)
Sherran Robinson, Ph.D. Harvard University. International rural economic development
Andrew Schmitz, Ph.D. University of Wisconsin-Madison. Trade, marketing, welfare economics (Robinson Chair in Agricultural Economics)
Brian D. Wright, Ph.D. Harvard University. Agriculture and resource policy
David Zilberman, Ph.D. University of California at Berkeley. Resource and quantitative policy
Ivan M. Lee, Ph.D. (Emeritus)
George Mahren, Ph.D. (Emeritus)
Mary J. Wright, Ph.D. (Emeritus)

Undergraduate Advisers: Mr. de Janvry, Mr. Fisher, Mr. Rausser, Mr. Robinson.

Graduate Advisers: Mr. Chalfant, Mr. Hanemann, Mr. Wright.

Graduate Program

Economics of Natural Resources

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

The major is structured to ensure that students obtain a sufficient background in the natural and physical sciences sufficient to enable them to pass the qualifying examinations in agricultural and environmental chemistry.

Graduate Courses

299. Research in Agricultural and Environmental Chemistry. (1-12) Course may be repeated for credit. Approval for four hours of research per week per unit. Prerequisites: Graduate standing and consent of instructor. Research in agricultural and environmental chemistry. (F,S,P) Staff

Graduate Program

Economics of Natural Resources

The Department of Agricultural and Resource Economics offers programs leading to the M.S. and Ph.D. degrees. Because of quota limitations, students are rarely admitted for the master's degree; although it may be awarded to students who are pursuing work toward the Ph.D. degree or in another field at Berkeley after fulfillment of the appropriate M.S. requirements. Applicants should hold a degree (not necessarily in agricultural economics) comparable to a bachelor's degree at the University of California and must have demonstrated strong scholarship potential.

The agricultural and resource economics program is relatively flexible; however, each program stresses economic theory, quantitative methods, and one elective field of specialization in conjunction with the graduate adviser. Some common elective fields include markets and trade, agriculture in economic development, agricultural policy, and natural resource economics.

The first year of course work in the Ph.D. program is normally devoted to economic theory and quantitative methods, after which the student writes departmental preliminary examinations in each of these areas. Although there are no specific course requirements, the level of sophistication expected in these preliminary examinations is defined with reference to a specific set of courses, and most students are advised to take these courses. Outstanding facilities are available within the department, including the Giannini Foundation Agriculture Economics Library, one of the world's foremost research libraries of its type.

Political Economy of Natural Resources

Lower Division Courses

1. Introduction to Political Economy of Natural Resources. (4) Only 2 units of credit will be given if students have already taken ECON 1. Three hours of lecture and one hour of discussion per week. Prerequisites: Math 1. Introduction to microeconomics with emphasis on the state.

2. Political Economy of Growth and Institutions. (3) Three lecture and one hour of discussion per week. Analysis of policy at the econometric level, focusing on the relationship between economic theories, economic policies, and the environment. Theories and models are presented in light of the statistical foundations of econometric analysis, macro models, input-output models, alternative theories of political economy, and theories of the state. Policy areas include macroeconomic analysis of monetary and fiscal policy, trade pol-
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icy, agricultural policy, pollution, and environmental degradation. (SP) Staff

98. Directed Group Studies (for Lower Division Students). (1-3) Course may be repeated for credit. One 11/2-hour meeting per unit per week. To be arranged. Mathematics 16A or 16B equivalent. Prerequisites: Consent of instructor. Group study of a selected topic or topics in Political Economy of Natural Resources. (F,SP) Staff

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 per discussion per week. Prerequisites: Political Economy of Natural Resources 100, Math 16A or 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) Perloff

101. Economics of Resources and the Environment. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Math 16A-16B, Political Economy of Natural Resources 100, Math 16A-16B, or Economics 100A or 101A. Theories of externalities and intertemporal resource allocation and application to renewable and exhaustible natural resources. Economics of pollution, resource transformation. Pollution control. Pesticide management. Water quality management in agriculture. (SP) Zilberman

115. Modeling and Management of Biological Resources. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Math 16A-16B or equivalent. Population growth, life tables. Harvesting and exploitation theory. Discounting and present value concepts. Methods for analyzing population interactions in natural and managed systems. Pest management and insect mass rearing. (SP) Getz

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; econometric applications to agricultural and resource issues. (F) Staff

141. Economics of the Food Systems. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100 or Economics 100A or 101A. Introduction to agricultural markets and the U.S. food marketing system. Demand and supply of agricultural products. Price supports, marketing orders, and other government policy. Nutritional policy including labeling, food safety, and food stamps. (F) Schmitz

142. Advanced Topics in Agricultural Economics. (2) Two hours of lecture per week. Prerequisites: 141 or consent of instructor. Qualitative and quantitative analysis of agriculture and natural resource markets. The influence of public sector versus private sector events on the dynamic path of commodity markets. The design, performance, and importance of commodity spot and futures markets. The relationships among exchange rate, interest rate, and natural resource and agricultural commodity futures markets. (SP) Rausser

151. Agriculture in Economic Development. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100 or Economics 100A or 101A. The role of agriculture in development and the impact of development on agriculture; food, population and resources; the transformation of traditional agriculture; policy issues in rural development. (F) de Janvry

152. Advanced Topics in Development and International Trade. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100 or Economics 100A. Economic analysis of demand, supply, institutional policies, and welfare implications of agricultural systems. Distributional effects of policy. Design and analysis of sector specific economic policy in open economies. Relations between trade and domestic policies. International effects of agricultural policy in developed nations. (SP) Adelman

161. Natural Resource Economics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100 or Economics 100A or 101A; POLCMR 101 recommended. Institutional land economics. Theories of land rent. Models of optimal use of minerals, timber, water, and related environmental resources. Relationships between economic growth and natural resources. (F) Fisher

162. Economics of Water Resources. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100 or Economics 100A or 101A; 101 recommended. Urban demand for water; water supply and economic growth; water utility economics; irrigation demand; land and water projects; location of surface water law and institutions; economics of salinity and drainage; economics of groundwater management. (SP) Hanemann

195. Senior Thesis. (4) Course may be repeated for credit. Individual meetings with faculty sponsor. Prerequisites: Senior standing in Economics 101A. Open to qualified upper division students. Writing of a thesis under the direction of member(s) of the faculty. Subject must be approved by faculty sponsor. (F,SP) Staff

197. Field Study in Political Economy of Natural Resources. (1-3) Course may be repeated for credit. Independent study must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Supervised experience in off-campus organizations relevant to specific aspects of political economy of natural resources. Regular individual meetings with faculty sponsor. Application required. (F,SP) Wright

199. Directed Group Studies for Advanced Undergraduates. (1-3) Course may be repeated for credit. Meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Group study of selected topic or topics in Political Economy of Natural Resources. (F,SP)

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

202. Issues and Concepts in Agricultural Economics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 201A or consent of instructor. Theory of demand and supply; theory of consumer behavior; rent seeking, social waste, and their tradeoffs. Price supports, marketing orders, and other government policy. 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,SP) Sadoulet, de Janvry

Agricultural and Food Resource Economics

Graduate Courses

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

202. Issues and Concepts in Agricultural Economics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 201A or consent of instructor. Theory of demand and supply; theory of consumer behavior; rent seeking, social waste, and their tradeoffs. Price supports, marketing orders, and other government policy. 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,SP) Sadoulet, de Janvry

259. Rural Economic Development Workshop. (1) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Analysis of policy issues in agricultural development using sectoral and regional models of growth and development. (SP) Adelman, Robinson

261. Natural Resource Economics. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. The theory of optimal management of renewable resources and the production of non-renewable resources. Applications to fisheries and forests. Theory of exhaustible resource depletion. Applications to energy
and minerals. Relationships between resources and growth. (F) Berck, Fisher.


269. Natural Resource Economics Workshop. (1) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Presentation and criticism of ongoing research by faculty, students, and staff. Not necessarily offered every semester. (F,SP) Staff

271. Nutritional Economics and Policy. (1-3) Three hours lecture per week. Prerequisites: Economics 201A-201B or equivalent consent of instructor. Examination of nutritional deficiencies, food assistance policy and programs. (SP) Lane, Robinson

"272. Economics of Consumption and Demand Analysis. (3) Three hours of lecture per week. Prerequisites: Economics 201A-201B or equivalent, or consent of instructor. This course is designed to provide a comprehensive understanding of subject matter in the areas of consumption and demand analysis, utility theory, and consumer behavior in order to acquaint students with problems addressed, methodology employed, and frontiers to be breached. Emphasis will be on various models used, especially those related to food and nutrition policy, functional forms, and assessment of empirical results.

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

299. Individual Research. (1-12) May be repeated for credit. Approximately 4 hours of research per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and consent of instructor. (F,SP)

601. Individual Study for Master's Students. (1-12) Course may be repeated for credit. Individual study. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field advisor for qualified students to prepare for the various examinations required for the M.S. degree. May not be used for unit or residence requirements for the M.S. degree. (F,SP)

602. Individual Study for Doctoral Students. (1-12) Course may be repeated for credit. Individual study. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field advisor for qualified students to prepare for the various examinations required 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: Teaching of PERN. (1-6) Course may be repeated for credit. One to two hours of lecture and one to two hours of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing, appointment as a teaching assistant or associate, or consent of instructor. Discussion, problem review and development, guidance of discussion classes, course development, supervised practice teaching. (F,SP)

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

Interdepartmental Studies Courses

Graduate Course

IDS 290. International Food and Nutrition Policies. (3) Sponsoring departments: Nutritional Sciences, Agricultural and Resource Economics, Social and Administrative Health Sciences. Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. Interdisciplinary course surveying the world situation emphasizing the links between food production, food consumption and nutrition; the effect of income and prices on food demand, and socio-economic factors affecting food consumption within and among households. The various nutritional problems plaguing developing countries (including famine); intervention measures such as food aid, feeding programs, price policies and nutrition education, and methods of program evaluation are reviewed. (SP)

Ancient History and Mediterranean Archaeology

(College of Letters and Science)

Group Major Office: 3422A Dwinelle Hall, 643-8741

Professors:

John K. Andersson, M.A., F.S.A. Oxford University. (Greek and Roman archaeology)

Gulfi Azarazyp, Ph.D. University of California at Berkeley. (Near Eastern literature)

Gary Boyarin, Ph.D. Jewish Theological Seminary. (Jewish literature, Talmudic culture)

Stanley H. Brandes, Ph.D. University of California at Berkeley. (Near Eastern epigraphy)

David J. Cohen, J.D. University of California at Los Angeles. (Ancient Near Eastern law, political and legal theory)

George F. Dalke, Ph.D. University of Pennsylvania. (Near Eastern law, political and legal theory)

Crawford H. Greenwell, Jr., Ph.D. University of Pennsylvania. (Classical art history)

Erich S. Gruen, Ph.D. Harvard University. (Roman and Hellenistic history)

Wolfgang J. Haarmann, Ph.D. Heidelberg University. (Sumerian studies, Mesopotamian history)

Anne D. Kifman, Ph.D. University of Pennsylvania. (Asyryology, ancient Near Eastern history)

Robert C. Krieger, Ph.D. Pennsylvania University. (Roman history, Latin historical authors and epigraphy)

Spiro K. Kostof, Ph.D. Yale University. (Architectural history)

Laurent Mayali, Ph.D. Montpellier. (Classical rhetoric, Roman law)

Jacob Milzorn, D.H.L. Jewish Theological Seminary. (Biblical religion, history of ancient Israel)

Stephen G. Miller, Ph.D. Princeton University. (Classical archaeology)

Raphael Sealey, M.A. Oxford University. (Greek history, Greek law)

John M. Smith, Jr., Ph.D. Columbia University. (Inner Asian history, numismatics, military history)

Eugenio Spirlet, M.A. University of Florence. (Greek, Latin linguistics, epigraphy)

Andrew F. Stewart, Ph.D. Cambridge University. (Ancient rhetoric, Greek and Roman art, literary archaeology)

David B. Storrs, M.A. Cambridge University. (Near Eastern Archaeology)

Ronald S. Student, Ph.D. University of California at Berkeley. (Greek history and epigraphy)

LeDuc T. Thwaite, Ph.D. Harvard University. (Greek and Latin Inquiries, Greek studies)

Ruth E. Tringham, Ph.D. University of Edinburgh. (Old World anthropology, prehistoric archaeology)

Darrell A. Amos, Ph.D. University of California at Berkeley. (Classical archaeology and art) (Etruscan)

W. Kendrick Pritchett, Ph.D. Johns Hopkins University. (Greek ekphrasis, epigraphy and history) (Etruscan)

Associate Professors:

Cathleen Keller, Ph.D. University of California at Berkeley. (Egyptian history, language and art)

Martin Schwartz, Ph.D. University of California at Berkeley. (Egyptian studies)

Assistant Professors:

Susanna Ehr, Ph.D. Oxford University. (History of late antiquity, early Christianity)

Visiting Professors:

Victor R. Gold, Ph.D. (Semitic languages, Syro-Palestinian history and archaeology)

J.E. Housman, Ph.D. Johns Hopkins University. (Syro-Palestinian archaeology)

Senior Staff:

Frank Asaro, Ph.D. University of California at Berkeley. (Provenance determination of archaeological artifacts)

The Major

There is no undergraduate major.

The Graduate Program

The program is interdisciplinary in nature, administered by a faculty group drawn from several departments. Both M.A. and Ph.D. degrees are offered. Fields of emphasis include Near Eastern history, Near Eastern archaeology, Egyptian literature, Near Eastern law, political and legal theory, and ancient Near Eastern law. Candidates for degrees will offer a combination of three of these fields or two ancient fields, one as a major subject, two as minor subjects. The program is open to students with the B.A. in a relevant area who have completed at least one year of undergraduate study in ancient history or archaeology. Applicants should have had sufficient training to undertake advanced work in at least one ancient language.

M.A. Requirements. The M.A. in the area of archaeological and art specializations requires 20 semester units and a thesis. The M.A. in the historical area requires 24 semester units, to be followed by a written examination in the major subject. All M.A. candidates are required to pass at least one language examination before the degree is awarded.

Ph.D. Requirements. There are no specific course requirements. It is expected that all students will take at least one A-HMA interdisciplinary seminar during their graduate study. Students should also take considerable seminar work in at least two of the departments represented in the A-HMA program and obtain some practical experience in archaeology. Candidates must pass examinations in two modern languages and two ancient languages. A candidate for the Ph.D. degree must then be eligible for the Ph.D. qualifying examinations, both written and oral, which test competence in the 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 Group in Ancient History and Mediterranean Archaeology.

Graduate Courses

210. Ancient History and Mediterranean Archaeology Interdisciplinary Seminar. (2,4) Course may be repeated for credit. One 3-hour class per week. Prerequisites: Graduate standing. Team-taught by faculty from two different departments. The purpose of the course 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. (SP) Staff

*Not offered 1991-92

101 on leave, spring, fall

200 on leave, fall

*Recalled to active service

†Recipient of Distinguished Teaching Award
Anthropology

(Course of Letters and Science)

Department Office: 232 Kroeber Hall, 642-3391
Chair: William S. Simmons, Ph.D.

University Professor
Sherwood L. Washburn, Ph.D. (Emeritus) Harvard University. Human evolution, experimental anthropology

Professors:
- Burton Benedict, Ph.D. University of London. Social structure, exhibition.
- Brent Berlin, Ph.D. Stanford University. Ethnobiology, cognitive, Mesoamerican.
- Gerald D. Berreman, Ph.D. Cornell University. Inequality, interaction, India.
- Stanley H. Brandes, Ph.D. University of California at Berkeley. Palau, Mexico, Mesoamerican.
- Philip S. Dockrey, Ph.D. University of Chicago. Physical anthropology, primatology, development.
- Alan Dundes, Ph.D. Indiana University. Folklore, psychoanalysis, symbolism.
- John A. Graham, Ph.D. Harvard University. Mesoamerican art, archaeology, epigraphy.
- John J. Gunther, Ph.D. University of Michigan. Discourse, sociolinguistics.
- Eugene A. Hamel, Ph.D. University of California at Berkeley. Damography, quantitative analysis, Europe.
- F. Clark Howard, Ph.D. Chicago. Primates and human evolution, paleoanthropology.
- Patricia S. Klen, Ph.D. University of California at Berkeley. Environmental archaeology, prehistoric, Pacific Islands.
- Laura Nader, Ph.D. Radcliffe/Harvard University. Mexico, 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 the master's or doctoral level, should plan their undergraduate program to meet graduate admission requirements. Students 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, are advised about the special requirements for both programs or about courses should inquire at 209 Kroeber Hall.

The collections and research facilities of the Robert H. Lowie 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 exhibition hall is 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 Lowie Museum, see Index.

The Anthropology Library, 230 Kroeber Hall, is part of the campus library system. It contains nearly 65,000 bound volumes and receives 965 current serial titles. Members of the University staff have access to the resources of all the University's libraries and primarily the faculty and students of the Anthropology Department. Many specialized materials remain in the Main Library and are duplicated there or in other branches. The Anthropology Library also houses a large reading room and facilities for reading microfilm.

The department maintains a laboratory for quantitative analysis in all branches of the discipline. The laboratory is centered on a sophisticated mini-computer system used in teaching as well as in undergraduate and graduate research. It functions both independently and as a link to campus Computer Services. Courses 169A and 190A and 190B are open to all students. The ANTHROBOTIC program offers the study of living things. The successful completion of this examination, students are advanced to candidacy for the Ph.D.

The Major

The lower division component of the major in anthropology consists of Anthropology 1, 2, and 3, with a minimum of 3 units. In planning their workload students should be aware that the Department adheres to Academic Senate Regulation 760: "The value of a course in units shall be reckoned at the rate of one unit for three hours of work per week, or the equivalent of this in the major, upon approval of the major adviser, enroll in the honors program. The program will include the writing of a thesis supervised under the H195A-195B series of courses.

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 awarded in the course of study leading to the doctorate.

Because of the number of students who wish advanced training, only a small percentage of applicants may be accepted into the program. Admission is considered only once a year for the following fall semester. The deadline for application is January 7.

Graduate Programs

Anthropology Ph.D. Program

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

Step I. This segment normally takes one year, during which students begin to narrow down their interests to particular topical and geographical fields of specialization.

Step II. During this period, which normally lasts from one to two years, students attend seminars, prepare three field statements in their specializations, satisfy their language requirement, and prepare for the Ph.D. oral qualifying examination. With the successful passing of this examination, students are advanced to candidacy for the Ph.D. degree.

Step III. Students undertake research for the Ph.D. dissertation under supervision of a three-person committee in charge of research and dissertation. The dissertation is based on the results of original field, laboratory, or library research, which normally requires a minimum of two and a half years. The writing of the dissertation customarily requires an additional year. On completion of the research and approval of the dissertation by the committee, the student is awarded the Ph.D. degree.

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

Medical Anthropology Ph.D. Program

General Information. The Department of Anthropology of the University of California at Berkeley, and the Graduate Group in Anthropology at the University of California at San Francisco, currently offer a joint Ph.D. in medical anthropology. Students may apply to enter the program through either the Berkeley or the San Francisco campus but not to both. The student determines the student's home base during the program. Financial aid, practical advising, and other routine services are provided by the campus through which the student enrolls. Additional benefits are derived by taking required course work on both campuses and by the participation of the faculty on both sides of the program on all qualifying examinations and on the doctoral dissertation committee. The degree is the same and bears the name of both campuses.
Medical Anthropology. Medical anthropology entails the exploration of humans as simultaneously physical and symbolic beings in both contemporary and evolutionary contexts. As such, medical anthropologists study medicine in a holistic, encompassing theory and practice from sociocultural, psychological, biological, biocultural, symbolic, and linguistic anthropology. It is concerned with questions of both theoretical and applied significance, and with research that is of relevance to the social sciences as well as to medicine and the biological sciences. Courses in bioevolutionary dimensions of disease are accompanied by seminars that explore pain, suffering, madness, and other human afflictions as a social language speaking to the critically sensitive or contradictory aspects of culture and social relations. Anthropological epidemiology asks the questions, "Who gets sick with what ailments?" (differential risks, forms of medical knowledge, and medical systems) and "Why?" (what social arrangements, cultural features, and biotic and technological 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 the physical 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 adviser.

For students entering the Berkeley campus with the B.A., the doctoral training program is estimated to take between five and six years, as follows: three to six hours of course work, one to two years of doctoral research, and one to two years of doctoral preparation. For a complete listing of faculty, consult the Medical Anthropology brochure available from Program Office, the General Catalog of each campus or the American Anthropological Association's Guide to Departments of Anthropology. Medical anthropology students also benefit from the faculty, courses, and resources of many departments at the University of California at Berkeley, and the Schools of Public Health at Berkeley, and the Schools of Medicine and Nursing at UCSF.

Application. Applications are considered once each year for the fall semester only. The application period opens in early September and the deadline for receipt of both departmental and Graduate Division applications is January 7. The minimum requirement for admission to the medical anthropology program at Berkeley is a baccalaureate degree, on the San Francisco campus a master's degree in anthropology or a related discipline, or a postbaccalaureate professional degree. Applications are screened by the anthropology faculty and selections for acceptance on the basis of academic achievement, GRE scores, relevant experience, and a strong statement of intellectual and professional purpose.

Medical anthropology courses are listed below: 115-118 and 215A-219.

Courses and Seminars

Courses and seminars are listed below. Instructor listings, semester offerings, course descriptions, and schedule changes are available in 232 Kroeber Hall.

Lower Division Courses

1. Introduction to Physical Anthropology. (4) Three hours of lecture and one hour of section per week. 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, interpretive theory, and social evolution. The human genetic components of behavior are defined and evaluated. (F,SP) Dolhinow, Milton

2. Introduction to Archaeology. (4) Three hours of lecture and one hour of section per week. Prehistory and cultural growth. (SP) Conkey, Deetz

3. Introduction to Social and Cultural Anthropology. (4) Three hours of lecture and one hour of section per week. The structure and dynamics of human social and cultural institutions. (F,SP) Nader, Potter

3L. Anthropological Fieldwork Research Methods Seminar. (3) Two hours of lecture and laboratory, plus seven hours fieldwork/study plus consultations per week. Prerequisites: Lower-division status. (SP) Nunn, Potter

4. Medical Anthropology courses are listed below:

*15. Seminar in Physical Anthropology. (3) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: Consent of instructor; lower-division standing. Each instructor will select one or more of the following topics in physical anthropology: evolutionary theory, taphonomic fossil record, stages of the life cycle, biological basis of behavior, the roots of human behavior, human adaptation, genetic components of human behavior, ecological adaptations, controversial topics, and their own interpretation. (F,SP) Lightbown, Simmons

*16. Seminar in Anthropology. (3) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: Consent of instructor; lower-division standing. Each instructor will select one or more of the following topics in physical anthropology: evolutionary theory, fossil record, stages of the life cycle, biological basis of behavior, the roots of human behavior, human adaptation, genetic components of human behavior, ecological adaptations, controversial topics, and their own interpretation. (F,SP) Lightbown, Simmons

*17. Seminar in Social and Cultural Anthropology. (3) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: Consent of instructor; lower-division standing. Topics in social and cultural anthropology such as the structure and dynamics of human cultures, institutions, and societies. (SP) Phillips

*18. Seminar in Social Topics in Anthropology. (3) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: Consent of instructor; lower-division standing. Topics in social and cultural anthropology such as the structure and dynamics of human cultures, institutions, and societies. (SP) Phillips

*19. Seminar in Special Topics in Anthropology. (3) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: Consent of instructor; lower-division standing. Topics in special topics in anthropology with an emphasis on integrated and interdisciplinary problems.

*21. Proseminar in Physical Anthropology. (3) One hour of lecture and one hour of laboratory per week. Prerequisites: Consent of instructor. (SP) Nunn, Potter

*22. Proseminar in Archaeology. (3) One hour of lecture and one hour of seminar per week. Prerequisites: Consent of instructor. (SP) Nunn, Potter

*23. Proseminar in Social and Cultural Anthropology. (3) One hour of lecture, one hour of seminar and one hour of section per week. (SP) Nunn, Potter

*24. Proseminar in Anthropology. (3) Course may be repeated for credit. One hour of lecture, one hour of seminar and one hour of section per week. Prerequisites: Consent of instructor. (SP) Nunn, Potter

*25. Proseminar in Anthropology. (3) Course may be repeated for credit. One hour of lecture, one hour of seminar and one hour of section per week. Prerequisites: Consent of instructor. (SP) Nunn, Potter

*26. Proseminar in Anthropology. (3) Course may be repeated for credit. One hour of lecture, one hour of seminar and one hour of section per week. Prerequisites: Consent of instructor. (SP) Nunn, Potter

*27. Proseminar in Anthropology. (3) Course may be repeated for credit. One hour of lecture, one hour of seminar and one hour of section per week. Prerequisites: Consent of instructor. (SP) Nunn, Potter

*28. Proseminar in Anthropology. (3) Course may be repeated for credit. One hour of lecture, one hour of seminar and one hour of section per week. Prerequisites: Consent of instructor. (SP) Nunn, Potter

*29. Proseminar in Anthropology. (3) Course may be repeated for credit. One hour of lecture, one hour of seminar and one hour of section per week. Prerequisites: Consent of instructor. (SP) Nunn, Potter

*30. Exploring Anthropology. (1) Freshman may repeat course in sophomore year. One and one half hour seminar every other week. Must be taken on a passed/not passed basis. Prerequisites: Freshman or Sophomore status. This course is designed for lower-division students who are considering Anthropology as a major or minor field. It will offer an introduction to the various fields of anthropology (cultural, physical, archeological, linguistic, medical) through structured meetings with anthropology faculty at Berkeley and occasional distinguished visitors to the Anthropology Department who will discuss their research interests and their own interpretation of the anthropological imagination.

*31. Anthropological Demography. (5) Not open to students who have taken 189A or 194. Three hours of lecture and one hour discussion per week. Prerequisites: Lower division status, and consent of instructor. Population theory and methodology and anthropological data and problems. Malthusian and Boserupian theories of population change. Nonhuman primate, paleodemography, hunter-gatherers, historical and ethnographic data, and applications of social-cultural factors infertility, mortality, nuptiality.

98. Directed Group Study. (1-4) Course may be repeated for credit, under the limitations applied to 197, 198, 199. Three to twelve hours of group study (or tutorial or fieldwork) per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Freshman and 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. (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: Consent of instructor. Freshman or Sophomore status. Individual research by lower division students. (F,SP) Staff

Upper Division Courses

Physical Anthropology

*100. Human Paleontology. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: 1. Origin and relationships of the extinct forms of mankind.

*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 genetic and physical differences among human populations; theories of racial origins, selective bases of human variation.

*102L. Physical Anthropology Laboratory. (1-3) Three to six hours of laboratory per week. Prerequisites: 100 or 101 or 105. Descriptive and analytical techniques and methods applicable to the study of inter-group remains and differences.

*103. Introduction to Human Osteology. (6) Six hours lecture and fourteen hours laboratory work and study time per week. Prerequisites: 1 or consent of instructor. 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 statistics in osteological analysis.

*104L. Advanced Human Osteology Laboratory. (1-4) Three to six hours of laboratory per week. Prerequisites: Consent of instructor. Freshman or Sophomore status. Introduction to the study of human skeletal remains including original research, interpretation, and critical evaluation of classical and modern osteological work.
105. Primate Evolution. (5) Three hours of lecture and three hours of laboratory per week. Prerequisites: 1. A course in paleontol- ogy, or a course in the natural history of the primate order. This course will present an introduction to the evolution of behavior. (F) Howell

106. Primate Social Behavior. (4) Three 1-hour lectures, 1-hour section. Prerequisites: Recommend 1 or Integrative Biology 32. Humans, apes, and selected monkeys are the primates of concern, and among this array patterns and degrees of social behavior vary greatly. Lectures present a general introduction to behavior and its ecological context, the interaction of biology and behavior from an evolutionary perspective, and an examination of the roots of modern human behavior.

107L Primate Social Behavior Laboratory. (4) Two hours of lecture and five hours of laboratory per week. Prerequisites: 106 and consent of instructor. Students observe the social behavior of monkeys living in normal groups, and prepare a comprehensive written report based on the analysis of their observations. A lab manual is provided including an introduction to computer analysis of behavioral data. (SP) Dolinhow

108. 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.

109. Dietary Anthropology of Humans and Non-Human Primates. (4) Three hours of lecture per week. This course focuses on the dietary behavior of human and non-human primates, seeking insights into factors underlying patterns of food selection, diet, breadth, food avoidance and unusual behaviors with respect to food. Gut anatomy, nutritional requirements and energetics are also considered.

110. Theory and Method in Physical Anthropology. (4) Three hours of lecture and one hour of required section per week. Prerequisites: 1. A unitary view of past history and current trends in the field of Physical Anthropology, emphasizing schools of thought, important figures and major areas of research.

111. Evolution of Human Behavior. (4) Three 1-hour lectures per week. This course will ask to what extent human behavior, as an invariable entity, group, social, and cultural dimensions can be understood using the relatively small number of basic principles provided by evolutionary biological considerations. (F) Sarich

Required of All Anthropology Majors

114A. History of Anthropological Thought. (4) Three hours of lecture; one hour of discussion section per week. This team-taught course will present a history of anthropological thought from the mid-nineteenth 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 and cultural studies. (F) Staff

114B. Current Issues in Anthropological Thought. (4) Three hours of lecture; one hour of discussion section per week. This course will be team-taught and will cut across the subdisciplinary perspectives within anthropology with an emphasis on the development of interdisciplinary approaches to the study of important topics in contemporary social/cultural/linguistic/medical anthropology, archaeology, and physical anthropology. (SP) Berlin, Sarich

Medical Anthropology

115. Introduction to Medical Anthropology. (4) Three hours of lecture and one hour of discussion or laboratory 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) Staff

116. Environmental Effects on Human Health and Disease. (4) Three hours of lecture and one hour of discussion or laboratory per week. Prerequisites: 1 or 3, plus a course in general biology or consent of instructor. Examination of related ecological constraints of diverse eco-systems and the biological responses of human populations to these stresses: arctic, high-altitude, and zones, grasslands, humid tropics, urban.

117. Nutrition and Genetics in Medical Anthropology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Comparative study of the interaction of diet, genetics, and evolutionary selection in human populations.

118. Socio-Psychological Aspects of Medical Anthropology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Comparative study of mental illness and socially generated diseases; psychiatric treatment, practitioners, and institutions.

119. Special Topics in Medical Anthropology. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 2. Upper division status and consent of instructor. Special topics in cultural, biomedical and applied approaches to medical anthropology.

Archaeology

121. Historical Archaeology. Archaeology of the period from the first European settlement in America, Australasia, South Africa, etc.

121A. American Material Culture. (4) Three hours of lecture per week. Prerequisites: 2. Formerly 121. Patterns in material culture match patterns behavioral and psychological aspects of American culture since the 17th century. Topics include architecture, domestic arts, mortuary art, foodways, and trash disposal. Euro-American, Afro-American, and Native-American examples are considered.

121B. Archaeology, Material Culture and Ethnicity in America. (4) Three 1-hour lectures per week. Prerequisites: 2 or instructor's consent. A comparative study of the archaeology and material culture of the various ethnic groups who have contributed to the formation of American culture, and the way in which material culture studies can illuminate the lives of diverse groups of people in the American past. Topics will include Inuit-White interaction in 17th century Newfoundland, the impact of the fur trade and westward expansion on the Native Americans of the Plains. (SP) Deetz

122. New World Cultures. Three hour lectures per week. Prerequisites: 2, except no prerequisite for 1220 or 1222. A variety of courses that consider the peoples and past cultures and societies of the New World, as known from ethnohistory, archaeology, art history, ethnography, and other sources. No specific sequence to courses; students may take any or all of the following in any sequence.

122A. Archaeology of North America. (4) Three hours of lecture per week. Prerequisites: 2. Formerly 122. Prehistory of North American Indians; prehistoric cultural areas; relations with historic Indians.

122B. Ancient Civilization of Mexico and Central America. (4) Three hours of lecture per week. Formerly 122. A study of the development, form, and history of pre-Columbian Indian civilization, surveying the achievements of the Maya, the Aztec, and their neighbors. (F) Graham

122D. World of Antique Maya. (4) Three hours of lecture per week. Formerly 122D. A comparative study of the development and culture history of the longest sustained tradition of aboriginal New World civilizations. (SP) Graham

122E. People of the Andes. (4) Three hours of lecture per week. Prerequisites: 2. Formerly 122E. Inca culture and its antecedents; a survey from the earliest times to the present.

122F. California Archaeology. (4) Three hours of lecture per week. Prerequisites: 2. Prehistory of California Indians; selected archaeological sites and current issues in interpretations.

123. Old World Cultures. Course may be repeated for credit. 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. (SP) Tringham

123A. Stone Age Archaeology. (4) Three hours of lecture per week. Prerequisites: 2. An overview of stone age cultures and developments. Topics or geographic areas of paleolithic research.

123B. Archaeology of Africa. (4) Three hours of lecture per week. Prerequisites: 2. Formerly 127. Selected topics and research problems in the archaeology of Pre-Pleistocene and/or post-Pleistocene of Europe.

123D. Archaeology of Eurasia. (4) Three hours of lecture per week. Prerequisites: 2. Formerly 127. Prehistory and early civilizations of Europe, Asia and the Near East.

123E. Mediterranean Archaeology. (4) Three hours of lecture per week. Prerequisites: 2 or consent of instructor. Prehistory and early civilizations of the Mediterranean basin and its hinterland.

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

124A. Archaeology of the South Pacific. (4) Three hours of lecture per week. Prerequisites: 2 or consent of instructor. Courses in method and theory of archaeological research, varying with instructor. (F) Conkey, Tringham

129. Prehistoric Art. (4) Three hours of lecture per week. Prerequisites: 2 or 3. Draws on study of art in non-literate societies and on archaeology to explore a range of prehistoric arts in cultural contexts: e.g., rock art; Ice Age Arts; prehistoric ceramics. Uses illustrative material from Lowie Museum.

130. Invention and Technology. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. Origin, history, and spread of fundamental inventions; illustrative material from the Lowie Museum of Anthropology.

131. Science in Archaeology. (4) Three hours of lecture and one 3-hour laboratory per week. Prerequisites: 2 or consent of instructor. A survey of the application of principles and techniques derived from the physical and life sciences to the interpretation of archaeological materials. (SP) Staff

132. Analysis of Archaeological Materials. (4) Course may be repeated for credit. Three hours of lecture and one 3-hour laboratory per week. Prerequisites: 2 or consent of instructor. Laboratory in analyzing the materials of prehistory (e.g., stone tools, ceramics, and/or metals).

133. Field Course in Archaeological Method. (4) One hour of lecture and six hours of field work per week. Prerequisites: 2 or consent of instructor. Practical experience in the field and archaeological sites and materials. Coverage may include reconnaissance, mapping, recording, and excavation.
134. Analysis of the Archaeological Record. (4) Three hours lecture and three hours of laboratory per week. Prerequisites: 2 or consent of instructor. Guidance in the preparation of excavated materials for publication, cataloguing, and analysis. Emphasis on drawing, photography and write-up. (F) Lightfoot

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

Social and Cultural Anthropology

137. Energy, Culture and Social Organization. (4) Three hours of lecture per week. This course will consider the interrelations of particular energy production and consumption patterns. It will examine the influence of culture and social organization on energy use, energy policy, and quality of life issues in both the domestic and international setting. Specific treatment will be given to mind-sets, ideas of progress, cultural variation in time perspectives and recourse use, equity issues, and the role of power holders in energy related questions. (SP) Porter

*138. Ethnographic Film. (4) Two 2-hour lectures per week. Prerequisites: 3 or equivalent. An overview of ethnocratic films on a variety of cultures which examines assumptions and basic techniques involved in the audiovisual recording of field data. Written and visual ethnographies will be contrasted.

*139. Controlling Processes. (4) Three 1-hour lecture-discussion sections: Those with at least one social science course will be more familiar with the subject matter. This course will discuss key theoretical concepts related to power and control and examine indirect mechanisms and processes by which direct control becomes hidden, voluntary, and unconscious in industrialized societies. Readings will cover language, law, politics, religion, medicine, sex and gender.

140. Tribal Societies. (4) Two 1½-hour or 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, economies relying on gathering, hunting and/or herding, and a context ranging from use of sickles to big-man organization and chieftainships. Often termed indigenous or primitive as well as tribal, their characteristics and present conditions both will be studied. (SP) Berreman

*141. Comparative Society. (4) Three hours of lectures per week. Prerequisites: 3 or consent of instructor. Theories of social structure, functional interrelationships of social institutions. Primary emphasis on non-Western societies.

142. Kinship and Social Structure. (4) Three hours of lecture per week. Prerequisites: 141. Comparison of kinship and family types throughout the world; techniques of kinship and structural analysis. (SP) Graburn

*143. Advanced Survey of Social and Cultural Anthropology. (4) Three hours of seminar per week (plus extensive reading and written project). Prerequisites: 3 or consent of instructor. Theories of social structure, functional interrelationships of social institutions. Primary emphasis on non-Western societies.

144. Social and Cultural Change. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. The short-term and long-term effect of social change on the nature of societies and their social structure.

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.

*146. Comparative Peasant Society. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. A comparative study of peasant society as a social type contrasted with primitive and industrial society.

147. Gender, Culture and Sexuality. (4) Three hours of lecture plus one hour of discussion section per week. Prerequisites: 3 or consent of instructor. Explores the meanings of gender in both evolutionary and comparative anthropological perspectives in an effort to understand the interplay of biology and culture in the production of sex roles and sexuality. Themes to be addressed include: science and its theories of gender, gender and social inequality, gender and power, cultural construction of gender and sexuality, health, mental health as affected by gender and sexuality; gender play (gender reversals, gender crossing, and symbolic resistance). (F,SP) Ong, Schepers-Hughes

148. Human Ecological Relationships. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. An overview of socio-cultural and ecological attributes of human populations. (F) Anderson

*149. Culture and Personality. (4) Three hours of lecture and one hour discussion section per week. Prerequisites: 3 or consent of instructor. Exploration of the relationship between culture and personality in non-Western societies. Personality attributes and characteristics as defined in various traditional and non-traditional anthropological models. Bibliography includes the major social, political, and cultural works that have influenced cultural anthropology. (SP) DeVoe

150. Social Problems in Changing Cultures. (4) Three hours of lecture and one hour of required section per week. Prerequisites: 3 or consent of instructor. Explorations of social changes in the cultures of the recent past. Topics will be addressed in the social sciences and the humanistic disciplines. (SP) Cross

151. Anthropology of Tourism. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. Studies tourist motivation and behavior and the political, economic, and cultural impact of tourism on host cultures and communities.

152. Art and Culture. (4) Three hours of lecture per week. Graphic and plastic arts and their relations to culture in non-literate societies; study of material from the Lowie Museum of Anthropology.

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. (SP) Obudo

*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 band to state, from foraging to industrial, from egalitarian to stratified, with attention to inequality defined by kinship, gender, age, servitude, class, caste, race, ethnicity, colonial status, etc.

155A. Politics and Anthropology. (4) Three hours of lecture per week. Prerequisites: 3. Anthropological concepts relevant to the comparative analysis of political systems. Particular attention will be given to the interrelations of culture and politics.

156B. Culture and Power. (4) Three hours of lecture per week. The course examines how representations of power and authority have been translated into cultural forms and social roles in different societies and places, and will consider new forms of consciousness and culture generated by the colonial encounter, agrarian transition, industrialization, emigration, and the dynamic of cosmopolitan culture on non-Western societies.

*157. Anthropology of Law. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. Comparative survey of the ethnography of law, including the tools and methods relevant to the comparative analysis of the forms and functions of law.

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.

*159. Ethnic Interaction: Contemporary Issues. (4) Three hours of lecture and one hour required section per week. This interdisciplinary course will discuss comparative topics in ethnic groups, ethnicity and ethnic identity. Approaches considered are those of recent sociologists, mythic and legend, and comparative Anthropology and Comparative Psychology. The course considers various ethnic conflicts and accommodation. Readings required cover both literature and social science.

Folklore

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

161. Narrative Folklore. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. The study of folktales and their role in oral and written language. (F) Dunham

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) Staff, Dunham

Linguistic Anthropology

*164. Introduction to Ethnobiology. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. Introduction to the study of human societies' knowledge and knowledge of the plant and animal world. Comparative study of human conceptual organization of the natural universe, especially views of the biological environment. Implications of folk classification and nomenclature for general principles of language, thought, and culture.

165. Language in Society. (4) Three hours lectures per week. Prerequisites: One course in linguistics or linguistic anthropology. Social and linguistic aspects of verbal activities, speech communities, language power relations, and language and ethnicity. (SP) Berlin

Methods

*169. Ethnographic Research Methods. (5) Course may be repeated for credit. Three hours of lecture and one hour of discussion section per week. Prerequisites: 3 and consent of instructor. These courses deal with the problems, design, methods, and applications of ethnographic research. There is no specific sequence to the courses; students may take any or all of the following courses in any sequence.

*169A. Elicitation and Computer Assisted Analysis of Ethnographic Text. (5) Three hours lecture; three hours laboratory plus nine hours reading, writing and class discussion per week. Prerequisites: 3. Formerly 163. Lectures will cover theory and practices in the elicitation of ethnographic data including ethnographic interviews, questionnaires, event analysis, life history narratives, and other. Students will read selected ethnographic studies to become acquainted with differing theoretical perspectives. Laboratory sessions will provide an introduction to the use of Sun Solaris and Solaris workstations for data entry, archiving of field notes, and basic text analysis.

*169B. Research Theory and Methods in Socio-Cultural Anthropology. (5) Three 1-hour lectures and one hour of required section per week. Prerequisites:
3. Formerly 169. Introduction to research problems 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) Ogbo

Area Studies

*170. China. (4) Three hours of lecture per week. Chinese culture and society with an emphasis on the village level.

*171. Japan. (4) Three hours of lecture and one hour of required discussion section per week. Ethnological treatment of historic and modern Japanese culture, covering art and religion, family, kinship, 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.

*172. United States Culture and Society. (4) Three hours of lecture per week. Anthropological theory and research on American culture and society.


*174. Indians of California. (4) Three hours of lecture per week. Survey of the cultures of the native people of California. Tribal divisions, arts, customs, archaeology.

*175. Native Peoples of South America. (4) Three hours of lecture per week. Archaeology, ethnology, and ethnohistory.

*176. Contemporary Latin America. (4) Course may be repeated for credit. Three hours of lecture per week. Ethnology of Indian and Mestizo culture with special emphasis on comparative organization, belief systems, language, cultures, and communication.

*177. Mexico and Central America. (4) Three hours of lecture per week. Emphasis on Peruvian-Indian assimilation, African influences, and prescientific societies, and the concept of national cultures. Discussion of contemporary issues will also be covered.


*179. European Society. (4) Three hours of lecture per week. Representative groups in historical and modern perspective. Rural-urban relationships and the dynamics of change.

*180. The Near East. (4) Three hours of lecture per week. Cultures of the contemporary Near East, with special emphasis upon Arab populations.

*181. 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) Graburn

*182. Sub-Saharan Africa. (4) Three hours of lecture per week. Cultures and social institutions of sub-Saharan Africa. (SP) Shack

*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) Berrem

*185. Mainland Southeast Asia. (4) Three hours of lecture per week. Peoples and cultures of mainland Southeast Asia with an emphasis on Burma, Thailand, and Vietnam. (SP) Phillips

186. Insular Southeast Asia. (4) Three hours of lecture per week. Peoples and cultures of insular Southeast Asia with an emphasis on Indonesia, Malaysia, and the Philippines. (SP) Anderson

*187. Peoples and Cultures of the Himalayas. (4) Three 1-hour lectures per week. Formerly 186 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).

*188. Topics in Area Studies. (4) Course may be repeated for credit. Three hours of lecture per week. Formerly 187. Special topics in cultural areas not otherwise covered.

General Topics

189. General Topics. Course may be repeated for credit, (but each lettered course below cannot be repeated). Three hours of lecture per week. Prerequisites: See specific course descriptions. Various topics within: Span more than one subdiscipline of Anthropology. Students may take any or all of the courses numbered 189 in any sequence. (F)

189A. Anthropological Demography. (4) Not open to students who have taken 94 or 194. Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly 194. Population theory and methods applied to anthropological data and problems. Mathusian and Boserupian theories of population change. Nonhuman primates, paleodemography, hunter-gatherers, historical and modern peasant populations. Emphasis on social-cultural factors in fertility, mortality, (SP) Ong

Application of Quantitative and Computer Methods to Anthropology

Note: See also 169A, above.

190A. Quantitative Methods In Anthropology I. (5) Three hours of lecture and three hours of laboratory per week. Prerequisites: 183 or equivalent required. Techniques of quantitative analysis appropriate to anthropology and other social and behavioral sciences. Emphasis on practical work in handling large data sets, statistical analysis, and computer usage. (F) Khanna

190B. Quantitative Methods In Anthropology II. (5) Three hours of lecture and three hours of laboratory per week. Prerequisites: 190A or equivalent required. Techniques of quantitative analysis appropriate to anthropology and other social and behavioral sciences. Emphasis on practical work in handling large data sets, statistical analysis, and computer usage. (SP) Khanna

193. Practical Computer Use and Laboratory. (3) One hour of lecture and a minimum of three hours of laboratory per week. Must be taken on a passed/not passed basis. Setting data for computer analysis; data entry; editing data; sorting and categorizing data; word-processing; exploratory data analysis. Must be taken concurrently with laboratory. (F,SP) Khanna

193B. Advanced Computer Techniques. (1-5) Course may be repeated for credit with permission of instructor. One 1 hour lecture and one 3 hour laboratory per week. Must be taken on a passed/not passed basis. Prerequisites: 193 or equivalent and permission of instructor. Advanced computer methods of practical interest to anthropologists and other social scientists. Topics include: file management utilities (searching, sorting, editing), text editing and formatting, shell script programming, data base design and use, and electronic communications. (F,SP) Khanna

Seminars and Independent Study

H195A-H195B. Senior Honors. (4,4) Three hours of tutorial per week. Credit and grade to be awarded upon completion of the sequence. 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) Staff

*196. Undergraduate Seminar. (4) Course may be repeated for credit. Two hours of tutorial per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Seminar for the advanced study of the subject matter of a previously given upper division course, emphasizing reading and discussion.

197. Fieldwork. (1-12) Course may be repeated for credit. Three 1-hour hours of 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. (F,SP) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. One to four hours of group tutorial per week. Must be taken on a passed/not passed basis. Prerequisites: 60 units; good academic standing. Undergraduate research by small groups is restricted by regulations governing 198 courses. (F,SP) Staff

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 passed/not passed basis. Prerequisites: Consent of instructor. Supervised independent study and research. (F,SP) Staff

Graduate Courses

Physical Anthropology

200. Human Evolution. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. (F) Howell

*201. Genetic Anthropology. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of Instructor.

*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. (SP) White

205. Comparative Anatomy. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

206. Fossil Hominids. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. (SP) White

*207. Molecular Anthropology. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of Instructor. (SP) Howell

208. Biochemical Anthropology. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of Instructor.

209. Human Adaptation. (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. Osteology. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

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. (F) Scheper-Hughes

*216. Infectious Diseases of Anthropological Importance. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of Instructor.

*217. Population Genetics and Health Status. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of Instructor.

*218. Topics In Biomedical Anthropology. (3) Course may be repeated for credit. One hour of lecture and one hour of consultation per week. Prerequisites:
Consent of instructor. Module series: parasitology, genetica, nutrition, entomology, immunology, microbiology, physiology.

"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. Mesoamerica. (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.

"224. African Protohistoric Archaeology. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Subject matter will vary; current issues and debates in the archaeology of Africa, e.g., trade, exchange, colonization, maritime adaptations, etc.

"225. European and Near Eastern Prehistory. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. (SP) Tringham

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

"227. Historical Archaeology Research. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Graduate standing with some background in archaeology, or undergraduates who have taken 226. Various topics and issues in the methods of archaeological analysis and interpretation: style, ceramics, architectural analysis, lithic analysis, archaeozoology, etc. (F) Lighthart

230. Special Topics in Archaeology. (4) Two hours of seminar per week. Prerequisites: Consent of instructor. (F,SP) Tringham, Conkey

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. Formerly a portion of the 240A-240B-240C series. Advanced survey of the major theoretical and empirical areas of social and cultural anthropology. Sequence begins Fall (F) Gumert, Graham

"245. History and Theory of Anthropology. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Formerly 226. Various topics and issues in the methods of archaeological analysis and interpretation: style, ceramics, architectural analysis, lithic analysis, archaeozoology, etc. (F) Lighthart

250A. Culture and Personality. (4)

250B. Deviacy. (4)

250C. Applied Anthropology. (4)

250D. Economic Anthropology. (4)

250E. Political Anthropology. (4)

250F. Religion. (4)

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

250H. Art and Culture. (4)

250L. Urban Anthropology. (4) (F) Ogbu

250M. Ecological Anthropology. (4) (F) Anderson

250N. Education and Culture. (4) Formerly 251S, 251T, and 250Q. (SP) Ogbu

250O. Social Interaction. (4) (F) Bereman

250P. Social Change and Development. (4)

250Q. Peasant Societies. (4)

250R. Analysis of Field Data. (4) (F,SP) Brandes, Schepfer-Hughes

250S. Material Culture. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. An examination of the ways in which material culture can tell us about societies. Reading on the analysis and exhibition of material culture. Each student will design an exhibition around an idea or ideas using material to be found in the Lowie Museum of Anthropology. Successful design may result in an exhibition. The seminar is interdisciplinary. (SP) Benedict

250T. Tribal Societies. (4) One 2-hour graduate seminar per week. Prerequisites: Consent of instructor. The comparative study of small-scale, kin based, non-stratified foraging and horticultural societies, with attention to anthropological theories about them. Images of them past and present, and policies toward them that have been implemented or advocated.

250X. Special Topics. (4) Formerly 250, 251Y and 251Z. (F,SP) Staff

251. Research Design. (4) Course may be repeated for credit. Two hours of seminar per week. (F,SP) Milton, Hammel

252. Psychology and Folklore. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

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

Folklore

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

261. Psychology and Folklore. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

262. North American Indian 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.

Linguistic Anthropology

270. Seminars in Linguistic Anthropology. (3) 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.

270A. Semantics. (4) Formerly 270a and 271A-271B.

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

270C. Language Variation. (4) Formerly 270E and 271E-271F.

270D. Formal Ethnography. (4) Formerly 270 and 271-271J.

270F. Ethn-Biology. (4) Formerly 270K and 271K-271L.

270G. Color Categorization. (4) Formerly 270M and 271M-271N.

270H. Ethno-Linguistics. (4) Formerly 270 and 271O-271P.

270L. Decision Making. (4) Formerly 270Q and 271Q-271R.

270X. Special Topics in Linguistic Anthropology. (4) Formerly 270 and 271S-271T. (F,SP) Berlin, Gumpez

Area Studies

280. Seminars in Area Studies. (3) 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. Sub-Saharan Africa. (4)

280C. South Asia. (4) (F) Ong

280D. China. (4)

280E. Japan. (4)

280F. Southeast Asia. (4) (SP) Anderson

280G. Oceania. (4)

280H. European Society. (4)

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

280J. South American Ethnology. (4)

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

Application of Quantitative and Computer Methods to Anthropology

293. Problems in Data Analysis. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Advanced practicum and seminar in quantitative and qualitative data analysis and computing.

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. (F,SP) Staff

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. (F,SP) Staff

299. Directed Reading. (1-6) Course may be repeated for credit. Two 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. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-12) Course may be repeated for credit. One to eight hours of consultation per week. Must be taken on a satisfactory/unsatisfactory basis. In preparation for Ph.D. examinations. Individual study in consultation with 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 degree. (F,SP) Staff

Professional Courses

301. Professional Training: Teaching. (1-6) Course may be repeated for credit for a maximum of twelve units. Eight hours of lecture and section and two hours

On leave, spring

Recalled to active service

Recipient of Distinguished Teaching Award
of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Group consultation with instructor. Supervised training with instructor on teaching undergraduates. (F;SP) Staff

Interdepartmental Studies Courses

Upper Division Course

**IDS 123. Animal Behavior Laboratory.** (3) Course may be repeated for credit. One 1-hour lecture, one 3-hour laboratory, one 1-hour discussion per week. Prerequisites: Biology 1 or 11; or Integrative Biology 31; or Anthropology 106; and consent of instructor. A laboratory introduction to the observational study of comparative animal behavior in a semi-naturalistic setting. Students will learn sampling and observational methods, recording formats, data analysis and written presentation. Lecutre and discussion will focus on comparative animal behavior. Animals will be those in the vertebrate colonies at the Field Station for Behavior Research. Sponsoring departments: Anthropology, Integrative Biology, and Psychology.

Graduate Courses

**IDS 215. Faunal Analysis in Archaeology.** (4) One lecture hour, one hour discussion, and two 3-hour laboratories per week. Prerequisites: Integrative Biology 184, 184L, or a course in comparative anatomy. Introduction of systemsatics of animals commonly found in archeological contexts, principles and procedures in faunal analysis of archeological sites, practical training in osteology and research methods, and preparation of a faunal analysis of an archeological site. Sponsoring departments: Anthropology and Integrative Biology.

**IDS 228. Human Evolution, Prehistory and Paleoenvironments.** (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. A seminar course devoted to consideration of current research in paleoanthropology and related subjects. Sponsoring departments: Anthropology and Integrative Biology.

Architecture

(College of Environmental Design)

Department Office: 232 Wurster Hall, 642-6942
Chair: Gary R. Brown, M.Arch.

Professors:
Christopher Alexander, Ph.D. Harvard University. Architectural design, pattern language.
Edward A. Alden, M.A., B.Arch. School of Edinburgh. Building technology, energy.
Richard Benjamin, M.Arch. Harvard University. Architectural design, building technology.
Sam Davis, M.E.D., F.A.I.A. Yale University. Architectural history.
Margaret P. Dhesi, Ph.D. University of California at Berkeley. Architectural design.
W. Russell Ellis, Jr., Ph.D. University of Illinois at Urbana-Champaign. Architecture.
Norma D. Evanson, Ph.D. Yale University. Architectural history.
Sanford Hirshen, A.I., B.Arch. F.A.I.A. Columbia University. Architectural design.
Spero Kostel, Ph.D. University of Illinois. Architecture.
Lara G. Lerup, M.Arch. Harvard University. Architectural history.
Dorlyn Lyndon, M.F.A., F.A.I.A. Architectural design.
Clare Cooper, M.A., M.C.P. University of Nebraska. Architecture.
Roger Montgomery, M.Arch. Harvard University. Urban planning.

Graduate Programs

The department offers the professional degree Master of Architecture and the academic degree Doctor of Philosophy.

**Master of Architecture.** The professional degree, Master of Architecture, will be awarded to students who successfully complete a program of studies of from one to three years' duration depending upon previous education and experience. The department 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 depend upon undergraduate major, professional, or other work experience, and previous graduate study, if any.

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

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 hold a B.A. or B.S. degree with 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. Each student must register for at least one unit per year of 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 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, 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 departmental graduate secretary.

**Master of Arts Degree in Design.** There is a small program in Visual Studies at the graduate level leading to the Master of Arts degree in Design. Students with an interest in pursuing graduate work in photography or involved with visual issues in the areas of graphics may apply.

The present degree is offered under Plan 1 of the Graduate Division, which requires 20 semester units plus a thesis. The length of time required for completion varies with the individual, depending in part upon previous preparation. An undergraduate degree from the College of Environmental Design or an arts-related field is not necessary. The principal emphasis in the admission process is on the portfolio which all applicants for admission to the graduate program must submit. For additional information please consult the announcement of the College of Environmental Design or the graduate secretary.

**Special Degree Program with the Department of City and Regional Planning.** The two departments offer a special degree program for exceptionally qualified students who hold the five-year undergraduate professional degree in architecture. After a minimum of two semesters and 24 units in the Department of Architecture, and three semesters and 36 units in the Department of City and Regional Planning, the candidate may receive both the M. Arch. and the M.C.P. degrees. Applicants should seek admission to the Department
Architecture and indicate on their application that they wish to be considered for the joint program.

For additional information please consult the Announcement of the College of Environmental Design or the graduate secretary.

Concurrent Degree Program with the Division of Structural Engineering and Structural Mechanics. The programs offer a joint program with a concurrent degree for exceptionally qualified students. Students must fulfill the course requirements for both departments, but are allowed to cross-credit some units of electives from each department toward the other department thus achieving a saving in time enrolled, varying from one to one year (depending on undergraduate requirements). Some engineering courses are prerequisite to entering the program or may be taken during the first year of enrollment without credit toward the minimum course requirements. Applicants should seek admission to the Department of Architecture (M. Arch. Program) and indicate on their application interest in the joint program.

Architecture

Architectural Design

Upper Division Courses

100A-100B. Fundamentals of Architectural Design. (5-5) Forty-five hours of lecture/seminar and 75 hours of studio/tutorial per semester. Prerequisites: ED 11A-11B. Must be taken in sequence. Introductory courses in the design of buildings. Problems emphasize the manifestations of social, technological and environmental determinants.

100A focuses on the design process, social factors and site planning. (F,SP)

100B stresses structures, materials, and energy considerations. Studio work is supplemented by lectures, discussions, readings and field trips. (F,SP)

101. Case Studies in Architecture. (5) Course may be repeated for credit as topic varies. Forty-five hours of lecture/seminar and 75 hours of studio/tutorial per semester. Prerequisites: 100A-100B. Problems in design of buildings of intermediate complexity. Each section deals with a selected topic, such as housing, site planning, institutional buildings, community development, and interiors. Studio work is supplemented by lectures, discussions, readings and field trips. (F,SP)

102. Design Development in Architecture. (5) Forty-five hours of lecture/seminar and 75 hours studio/tutorial per semester. Prerequisites: 100A-100B. The development of architectural concepts into detailed design including the integration of structure, construction, and building systems, and the production of construction documents. Studio work is supplemented with lectures, discussions, readings and field trips. (F,SP)

105. Community Design Studio. (5) Forty-five hours lecture/seminar and seventy-five hours studio tutorial per semester. Prerequisites: 100A. Synthesis of social, political, and technological issues through architectural case studies.

109. Seminar in Architectural Design. Course may be repeated for credit when topic changes. Fifteen hours of lecture/seminar per unit per semester. Prerequisites: Consent of instructor. Selected topics in the theories and concepts of architectural design. For current selection offerings, see departmental announcement.

109A. Seminar in Architectural Theory. (1-4) (F,SP)

109B. Seminar in Architectural Criticism. (1-4) (F,SP)

109C. Current Issues in Architecture. (1-4) (F,SP)

109X. Special Topics: Architectural Design. (1-4) (F,SP)

Graduate Courses

200A-200B. Fundamentals of Architectural Design. (7-7) Sixty hours of lecture/seminar and 120 hours of studio per semester. 200A must be taken on a satisfactory/unsatisfactory basis. Course must be taken for a letter grade. Introductory course in architectural design and theories for graduate students. Problems emphasize the major social, technological and environmental determinants of building form. Studio work is supplemented by lectures, discussions, readings, and field trips.

201. Case Studies in Architectural Design. (5) May be repeated for credit. Forty-five hours of lecture/seminar and 75 hours of studio/tutorial per semester. Prerequisites: 100A-100B or 200A-200B. Each section deals with a specific problem such as housing, high-rise design, interiors, community development. Studio work is supplemented by lectures, discussions, readings, and field trips. (F,SP)

202. Final Project in Architectural Design. (5) Forty-five hours of lecture/seminar and 75 hours of studio/tutorial per semester. Prerequisites: Second or third year graduate standing. Seminar on structural, electrical and mechanical systems relating to the student's current graduate design studio project.

208A. Structural System Design. (2) (SP)

208B. Mechanical System Design. (1) (SP)

208C. Electrical System Design. (1) (SP)

209. Seminar: Architectural Design. Course may be repeated for credit when topics differ. Fifteen hours of lecture/seminar per unit per semester. Prerequisites: Second or third year graduate standing. Seminar deals with major problems and current issues in architectural design. (F,SP)

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

209B. Seminar in Architectural Criticism. (1-4) (F,SP)

209C. Current Issues in Architecture. (1-4) (F,SP)

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

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 relations between social functions and architectural design, with respect to individuals, groups, families, neighborhoods, and organizations. (F,SP)

110. Social and Cultural Factors in Design. (3) May be repeated for credit. Forty-five hours of lecture/seminar per unit per semester. Prerequisites: 110 or consent of instructor. Study of relationships between social and institutional functions and environments. (F,SP)

210. Advanced Study in Social and Cultural Factors in Design. (5) Forty-five hours of lecture/seminar per unit per semester. Prerequisites: 110 or consent of instructor. Study of relationships between social and institutional factors and environments. (F,SP)

211. Social and Cultural Factors in Design: Research Methods. (2) May be repeated for credit. Thirty hours of lecture/seminar per semester. Required for doctoral students and recommended for Master's students in the area of Social and Cultural Factors in Design. (F)

218. Colloquium on Social, Cultural, and Behavioral Issues in Design. (1) Course may be repeated for credit. Three hours seminar every other week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Required for Doctoral students in the Social Area of study. A forum for the presentation of research projects by doctoral students, resident faculty, visiting scholars, and visiting faculty. (F,SP) Crazn; Marcus

219. Seminar on Social and Cultural Bases in Design. Course may be repeated for credit when topics differ. Fifteen hours of lecture/seminar per unit per semester. Formerly 211 and 219A through 219G. Selected topics such as social policy and building form, energy issues for social populations, the birth and death, social form and housing form, personal and societal values in design, participatory design, and urban parks. For current section offerings see departmental announcement.

219A. Design in the Third World. (1-4) (F,SP)

219B. Designing for Special Populations. (1-4) (F,SP)

219C. Programming and Evaluation. (1-4) (F,SP)

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

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

219F. Urban Parks. (1-4) (F,SP)

219X. Special Topics: Social and Cultural Bases of Design. (1-4) Course may be repeated for credit when topics differ. Fifteen hours lecture/seminar per unit per semester. Prerequisites: 210 or consent of instructor. (F,SP)

Practice of Design

Upper Division Courses

120. Introduction to the Practice of Architecture. (3) Forty hours of lecture and 20 hours of discussion per semester. Architect, owner, developer, contractor relations, contract documents, and the ethics of the profession. (F)

122. Introduction to Community Development. (5) Forty-five hours of lecture/seminar and 180 hours of internship in Bay Area agencies and organizations. Prerequisites: 100A. (F)

129. Seminar in the Practice of Design. Course may be repeated for credit when topics differ. Fifteen hours of lecture/seminar per unit per semester. (F,SP)

129A. Housing Design Seminar. (1-4) Course may be repeated for credit. Fifteen hours lecture/seminar per unit per semester. (F,SP)

129B. Written and Graphic Skills for Designers. (1-4) Course may be repeated for credit. Fifteen hours lecture/seminar per unit per semester. (F,SP)

129X. Special Topics in the Practice of Design. (1-4) Course may be repeated for credit when topics differ. Fifteen hours lecture/seminar per unit per semester. (F,SP)

Graduate Courses

220. Advanced Study in the Practice of Design. (3) May be repeated for credit. Forty-five hours of lecture/seminar per unit per semester. Prerequisites: 120 or 122 or consent of instructor. Professional practice, its organization, methods, and problems.

222. Advanced Study in Community Development. (2) Thirty hours of lecture/seminar per semester. Political and ethical implications of professional intervention aimed at social change, and its impact on current practice.

225. Architectural Internship. (5) Thirty hours of lecture/internship and 135 hours of internship per semester. Prerequisites: 120; undergraduate seniors need consent of instructor. An intensive and structured introduction to the professional practice of architecture. Using the resources of practicing architect's offices as the "laboratory." (F,SP)

229. Seminar on the Practice of Design. Course may be repeated for credit, when topics differ. Fifteen hours of lecture/seminar per unit per semester. 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.

229A. Advanced Project Development Analysis. (1-4) Prerequisites: Designated section of 129, (F,SP)

229B. Architectural Practice: Construction Document Phase. (1-4) (F,SP)

229C. Architectural Practice: Construction Phase. (1-4) (F,SP)

229D. Construction Management. (1-4) (F,SP)

229E. Cost Estimation. (1-4) (F,SP)

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

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

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

229I. Professional Writing. (1-4) (F,SP)

229J. The Market for Architecture. (1-4) (F,SP)

229K. Case Studies in Design. (1-4) (F,SP)

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

**Design Theories and Methods**

**Upper Division Courses**

130A. Introduction to Design Theories and Methods. (3) This course is intended to have taken Environmental Design 130 will receive no credit for 130A. Sixty hours of lecture and twenty hours of discussion per semester. Comparison and discussion of the theories of environmental design, and development of various methods, tools, and techniques available for environmental designers. Particular emphasis lies on the difficulties of environmental design and related fields. (F,SP)

130B. Computer Applications to Design Methods. (1) Fifteen hours of lecture per semester. Prerequisites: 130A. An introduction to the use of microcomputers in design, this course surveys existing software packages which lend themselves to design applications or have been specifically developed for such applications. The usefulness, problems, and limitations of the software will be discussed. (F,SP)

132. Computer Applications in Architecture. (3) Two 1½-hour lectures and one 1-hour laboratory per week. Prerequisites: IDS 110 or equivalent or consent of instructor. Survey of applications of computers in the architectural profession. Topics include 2D/3D computer-aided design, architectural databases, computer analysis and models, and impact on the profession. Final grade is based on homework and programming assignments, midterm, project, and final exam. (F,SP)

135. Project Development: Analysis, Strategy, Financing. (3) Two hour lectures and one hour discussion per week. Prerequisites: 100A-100B and senior standing. Introduction to the property development process with a focus on techniques for determining the economic viability of a project; the influence of financing on design and development decisions. (SP)

139. Seminar in Design Theories and Methods. Course may be repeated for credit when topics differ. Fifteen hours of lecture/seminar per unit per semester. Prerequisites: 130. Special topics such as evaluation methods, information problems in design, development of design concepts, computer programming for design. For current section offerings see departmental announcement. (F,SP)

139X. Special Topics: Design Theories and Methods. (1-4) Course may be repeated for credit as topics differ. 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) 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. (F,SP)

239A. Design and Computers. (1-4) (F,SP)

239B. Environmental Models and Model Environments. (1-4) (F,SP)

239C. Ethics of Design. (1-4) (F,SP)

239D. Logic of Design. (1-4) (F,SP)

239E. Mathematical Models of Design. (1-4) (F,SP)

239F. Planning and Design of Infrastructure. (1-4) (F,SP)

239G. Spatial Configurations. (1-4) (F,SP)

239H. The Knowledge of the Designer. (1-4) (F,SP)

239X. Special Topics: Design Theories and Methods. (1-4) May be repeated for credit as topics differ. (F,SP)

**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: Physics 140 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 when topics differ. Fifteen hours of lecture/seminar per unit per semester. Prerequisites: 140. Special topics such as climatic design, HVAC systems, lighting and acoustics. For current section offerings see departmental announcement. (F,SP)

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

149B. Artificial Lighting. (1-4) (F,SP)

149C. Lighting Design. (1-4) (F,SP)

149D. Heating, Ventilating, and Air Conditioning Systems. (1-4) (F,SP)

149E. Solar Heating. (1-4) (F,SP)

149X. Special Topics: The Physical Environment in Buildings. (1-4) Course may be repeated for credit when topics differ. (F,SP)

**Graduate Courses**

240A-240B. Advanced Study of Energy and Environmental Issues in Design. (3) Forty-five hours of lecture/seminar per semester. Prerequisites: 140 or consent of instructor. Preparation for doctoral students in the area of Environmental Physics. Required for doctoral students in the area of Environmental Physics. (F,SP)

241. Research Methods in Building Sciences. (2) May be repeated for credit. Thirty hours of lecture/seminar per semester. Prerequisites: Required for doctoral students in the area of environmental physics. Re- quired for doctoral students in the area of Environmental Physics. (F,SP)

242. Building Environments. (1) Fifteen hours lecture/seminar, offered first 5 weeks of summer. Prerequisites: 140 or consent of instructor. Preparation for advanced study in thermal building sciences. This course provides a theoretical basis for advanced elective courses in the energy area including principles of heat transfer, airflow, psychrometrics, and thermal comfort. (F,SP)

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

244. Mechanical Systems for Environmental Control. (3) Thirty hours lecture/seminar, offered last 10 weeks of semester. Prerequisites: 140, 242 or consent of instructor. Introductory overview of principles and practical aspects of heating, ventilating, and air-conditioning (HVAC) of buildings. Discussion of criteria for comfort, and methods for estimating energy flows in buildings and resulting heating and cooling loads. Various types of HVAC systems will be described. (SP)

245. Daylighting Analysis Using Physical Models. (3) Two 1½ hour seminars 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 techniques. (F,SP)

249A. Appropriate Technology. (1-4) (F,SP)

249B. Artificial Lighting. (1-4) (F,SP)

249C. Lighting Design. (1-4) (F,SP)

249D. Natural Lighting. (1-4) (F,SP)

249E. Occupant Response. (1-4) (F,SP)

249F. Solar Technology. (1-4) (F,SP)

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 laboratory per semester. Prerequisites: Physics 8A. Study of forces and structural constraints in the design of buildings. Structural concepts are explored in laboratory settings. (F,SP)

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. (F)

159. Seminar on Structures and Construction. Course may be repeated for credit when topics differ. Fifteen hours of lecture/seminar per unit per semester. Prerequisites: 120. Special topics such as building performance, production and materials. For current section offerings see departmental announcement. (F,SP)

159A. Building Performance: Case Studies. (1-4) (F,SP)

159B. Building Performance Failures. (1-4) (F,SP)

159C. Building Production: Theory and Practice. (1-4) (F,SP)

159D. Building Materials. (1-4) (F,SP)

159E. Construction Economics. (1-4) (F,SP)

159X. Special Topics: Structures and Construction. (1-4) Course may be repeated for credit when topics differ. (F,SP)

**Graduate Courses**

250. Advanced Study of Structures. (3) Forty-five hours of lecture/seminar per semester. Prerequisites: Civil Engineering 128A-128B. Tension structures, shell structures, long span structures, model analysis and experimental structures. (SP)
The Building Process

Upper Division Courses

160. The Nature of Order. (3) Three hours 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. (F)

163. Architecture Shop Course. (3) Two 3-hour laboratories per week. Materials and processes in the fabrication of wood, plastic and metal. (F,SP)

Graduate Courses

260A. The Nature of Order, Graduate Seminar. (1) Two 1-hour seminars 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. (F)

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

260C. Color. (6) Sixty hours seminar/workshop per semester. Prerequisites: 260A 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 color charts under color objects. (SP)

260D. Patterns in Different Cultures. (3) Forty-five hours lecture and 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. (SP)

History of Architecture

Upper Division Courses

170A-170B. An Historical Survey of Architecture and Urbanism. (4-4) Forty-five hours of lecture and 15 hours of seminar/discussion per semester. Formerly 170 and 171. 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)

171. Survey of Urban Design. (3-4) Forty-five hours of lecture per semester; additional 15 hours of lecture for one additional unit. Prerequisites: 170A-170B. The evolution of urban form, civic design, and planning theory with emphasis on the development of the modern city. (SP)

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

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

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

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

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

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

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

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

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

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

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

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. (F,SP)

279. Seminar in the History of Architecture. Course may be repeated for credit as topics differ. Fifteen hours of lecture/seminar per semester. Prerequisites: 179 or consent of instructor. (F,SP)

279A. African Architecture. (1-4) (F,SP)

279B. Asian Architecture. (1-4) (F,SP)

279C. California Architecture. (1-4) (F,SP)

279D. History of Housing. (1-4) (F,SP)

279E. Mesoamerican Architecture. (1-4) (F,SP)

279F. Modern Architecture. (1-4) (F,SP)

279G. San Francisco Architecture. (1-4) (F,SP)

279H. Urban Design. (1-4) (F,SP)

279I. Victorian Architecture. (1-4) (F,SP)

279J. Renaissance-Baroque Architecture. (1-4) (F,SP)

279K. Special Topics: Architectural History. (1-4) Course may be repeated for credit, as topics differ. (F,SP)

Special Studies Courses

Upper Division Courses

188. Special Group Study. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Studies developed to meet individual 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. Special group studies 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 advisor and designed to reinforce the student's background in areas related to the proposed dissertation topic. (F,SP)

602. Individual Study for Doctoral Students. (1-4) 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 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)

Professional Courses

381. Seminar for Teaching Assistants in Social and Cultural Factors in Design. (1-2) May be repeated twice for credit. Fifteen hours of seminar/discussion per unit per semester. Must be taken on a satisfactory/unsatisfactory basis. Required course for all teaching assistants in this area. (F,SP)

382. Seminar for Teaching Assistants in Practice of Design. (1-2) May be repeated twice for credit. Fifteen hours of seminar/discussion per unit per semester. Must be taken on a satisfactory/unsatisfactory basis. Required course for all teaching assistants in this area. (F,SP)

384. Seminar for Teaching Assistants in Building Environments. (1-2) May be repeated twice for credit. Fifteen hours of seminar/discussion per unit per semester. Must be taken on a satisfactory/unsatisfactory basis. Required for all teaching assistants in this area. (F,SP)

386. Seminar for Teaching Assistants in Structures and Construction. (1-2) May be repeated twice for credit. Fifteen hours of seminar/discussion per unit per semester. Must be taken on a satisfactory/unsatisfactory basis. Required course for all teaching assistants in this area. (F,SP)

387. Seminar for Teaching Assistants in History of Architecture. (1-2) May be repeated twice for credit. Fifteen hours of seminar/discussion per unit per semester. Must be taken on a satisfactory/unsatisfactory basis. Required course for all teaching assistants in this area. (F,SP)

Interdepartmental Studies Course

IDS 235. Community Scale Energy Systems. (3) Two 1-1/2-hour lectures/discussions per week. Prerequisites: Consent of instructor. Energy supply at the community scale through development of locally available renewable energy resources (solar, wind, biomass). Architecture, site planning, and urban development; review of conservation and supply tech-
Visual Studies
Upper Division Courses
180A-180B. Introduction to Visual Studies: Word and Image. (4-8) 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. (F,SP)

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)

185. Selected Topics: Word and Image. Course may be repeated for credit, as topics differ. Fifteen hours lecture per unit per semester. Prerequisites: Environmental Design 11A-11B. Studio sections in assignments on topics such as photography, the history of letter forms, and typography. For current offerings see the departmental announcement. (F,SP)

185A. Typography. (1-4) Course may be repeated for credit. (F,SP)

186. Special Topics: Word and Image. (1-4) Course may be repeated for credit, as topics differ. (F,SP)

186. Selected Topics: Photography. (1-4) Course may be repeated for credit, as topics differ. Fifteen hours lecture/seminar or 60 hours of studio/laboratory per unit per semester. Prerequisites: 181, Studio sections in Photography as an Art Form, Documentary Photography, Light and Motion Studies, Artificial Lighting Photography. For current section offerings see departmental announcement. (F,SP)

186A. Documentary Photography. (1-4) Course may be repeated for credit. (F,SP)

186B. Light and Motion Studies. (1-4) Course may be repeated for credit. (F,SP)

186C. Photography as an Art Form. (1-4) Course may be repeated for credit. (F,SP)

186X. Special Topics: Photography. (1-4) Course may be repeated for credit, as topics differ. (F,SP)

187. Selected Topics: Drawing. Course may be repeated for credit. Fifteen hours lecture/seminar or 60 hours studio/laboratory per unit per semester. Prerequisites: Environmental Design 11A-11B.

187A. Freehand Drawing. (1-4) Course may be repeated for credit. (F,SP)

187B. Life Drawing. (1-4) Course may be repeated for credit. (F,SP)

187X. Special Topics: Drawing. (1-4) Course may be repeated for credit. (F,SP)

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

197. Field Studies in Visual Studies. (1-4) No more than 4 units are allowed in any one semester. May be repeated for credit. Must be taken on a passed/not passed basis. Supervised experience relevant to specific areas of design and research. Regular individual meetings with faculty sponsor and written reports required. See General Catalog regarding unit limitation toward the degree. (F,SP)

198. Special Group Study. (1-4) No more than 4 units are allowed in any one semester. 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)

199. Supervised Independent Study and Research. (1-4) May be repeated for credit. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations listed in General Catalog. Studies developed to meet individual needs. (F,SP)

Graduate Courses
280. Advanced Visual Studies. (1-3) Course may be repeated for credit when topic changes. Fifteen hours lecture/seminar per unit per semester. Prerequisites: 181, 186. Advanced work in visual studies and photography. (F,SP)

281. Seminar in Photography. (3) May be repeated for credit. Forty-five hours of lecture/seminar per semester. Prerequisites: 181 and 186. Selected topics such as Photography in Photography, Photography as an Art Form, or Environmental Photography. For current section offerings see departmental announcement. (SP)

289. Seminar in Visual Studies. (2) Course may be repeated for credit. Fifteen hours lecture/seminar per semester. Orientation seminar required of all graduate students in the M.A. program in Visual Studies. (F,SP)

288. Special Group Study. (1-5) No more than 5 units are allowed in any one semester. May be repeated for credit, subject to unit limitation. Special group study topics to be introduced by instructor or students. (F,SP)

299. Individual Study and Research for Master's Students. (1-5) Course may be repeated for credit. One unit will be assigned for each 4 hours of student effort per week. Individual studies including reading and individual research under the supervision of a faculty adviser and designed to reinforce the student's background in areas related to the proposed topic. (F,SP)

Professional Courses
388. Seminar for Teaching Assistants in Visual Studies. (1-2) May be repeated for credit. Fifteen hours seminar/discussion per unit per semester. Required course for all Teaching Assistants in this area. (F,SP)

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

Practice of Art
Department Office: 238 Kroeber Hall, 642-2582
Chair: Anne L. Mealy, B.A.

Professors:
Boyd G. Allen, M.A.
Christopher G. Brown, M.F.A.
Robert L. Hartman, M.A.
James F. Melchert, M.F.A.
George J. Miyasaki, M.F.A.
David W. Simpson, M.A.
Brian A. Wall
Elmer N. Bischoff, M.A. (Emeritus)
Sidney Gordin (Emeritus)
John C. Haley (Emeritus)
Karl A. Kasten, M.A. (Emeritus)
Erie Loram, M.F.A. (hon.) (Emeritus)
James A. McCray, M.F.A.
Felix Fratoni (Emeritus)
Pete H. Voukis, M.F.A. (Emeritus)

Associate Professors:
Jerold C. Balfälne, M.F.A.
Anne L. Healy, B.A.
Mary L. O'Neal, M.A.

Assistant Professors:
Richard B. Shaw, M.F.A.
Katherine D. Shearon, M.F.A.
Wendy Susman, M.F.A.

Four goals underlie the teaching in the Department of Art:
1. To advance the body of knowledge of human artists and their work
2. To help students learn to think visually
3. To help students understand the strategies that artists have devised to deal with esthetic problems in both traditional and nontraditional methods of artmaking.
4. To help students develop a creative intelligence through practicing a visual arts discipline.

To the extent that artmaking is a means for rendering the unknown known, it can be regarded as complementary to scientific investigation.

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 artworks. An art student should be familiar with methods in which visual ideas have been manifested 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 Worth Ryder Art Gallery, an adjunct educational facility that is open to the public.

Major Program
Lower Division: Art 10, 12, and 14. Art 10 is prerequisite to Art 12.

Upper Division: Art 150, 117 or 118, and five additional upper division courses in Practice of Art. Three of the studio courses must be taken with three different members of the regular faculty.

History of Art: A minimum of three courses, at least one of which must be upper division.

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 the 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 and 30 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 and summarized in a written thesis.

Further information about this program may be obtained from the Art Office, 238 Kroeber Hall.

Lower Division Courses

10. Color and Composition. (3) Two 3-hour instructional studio periods and one 3-hour open studio period per week. Introduction to drawing, composition, and color theory. Charcoal, pastel, acrylic and other media on paper. (F,SP)

12. Figure Drawing and Painting. (3) Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisite: 10. Introduction to the use of the human figure in painting and drawing composition. (F,SP)

14. Introduction to Sculpture. (3) Two 3-hour instructional studio periods and one 3-hour open studio
period per week. Projects introduce ways of improvising with raw materials and physical space to create aesthetic structures. Field trips and illustrated lectures will acquaint students with the ideas that sculptors have explored in the 20th century. (F, SP)

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Lower Division Seminar. (2) Two 1½-hour instructional periods per week. Weekly discussions will introduce students to visual thinking and to the ideas both in art and other disciplines that artists have investigated and developed in historical and contemporary times. Assigned reading and field trips will provide the basis for discussions. (F, SP)

Upper Division Courses

102. Approaches to Painting. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 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. A. Mr. Hartman; B. Mr. Allen; C. Mr. Miyasaki; D. Mr. Simpson; E. Mr. Ballaine; G. Ms. O'Neal; I. Mr. Brown; J. Ms. Sherwood; K. Ms. Sussman; V. Visitori(s). (F, SP)

161. Materials and Processes of Painting. (3) Course may be repeated once for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 or equivalents. Introduction to human figure seen in the context of pictorial space, and materials used in painting. This course extends the student's knowledge of the raw materials of painting, i.e., their composition, potentials, and limitations, and the techniques employed in the use of these materials. (F)

117. Drawing and Composition. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 or equivalents. Traditional and contemporary methods and materials of drawing and painting. This course extends the student's knowledge of the raw materials of painting, i.e., their composition, potentials, and limitations, and the techniques employed in the use of these materials. (F)

118. Figure Drawing. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 or equivalents. Emphasis on the human figure seen in the context of pictorial space, and materials used in painting. This course extends the student's knowledge of the raw materials of painting, i.e., their composition, potentials, and limitations, and the techniques employed in the use of these materials. (F)

120. Intaglio. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 or equivalents. Etching, drypoint, aquatint, color printing, and other intaglio processes as well as photographic intaglio processes. Art 117 or 111 is required of all art majors. (F, SP)

122. Lithography. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 or equivalents. Lithography, utilizing the planographic printing process. Emphasis on developing concepts in design and in the application of photographic techniques to the lithographic medium. Art 117 or 111 is required of all art majors. (F, SP)

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

130. Fabricated Metal Sculpture. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 or equivalents. The construction of metal sculpture using welding, brazing, and soldering techniques. (F)

131. Cast Metal Sculpture. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 or equivalents. The construction of metal sculpture using lost-wax and other traditional techniques. (SP)

132. Ceramic Sculpture. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 or equivalents. Techniques taught using wood-working equipment for constructing sculpture. Use of color and media such as wood, metal, and plastic is encouraged. (F)

133. Wood Sculpture. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 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. Materials will be chosen dependent on the exigencies of the site and of the interest of the student. (SP)

138. Environmental Sculpture and Sited Work. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 or equivalents. The focus of the course will be on ways of inventing narrative connections among images through the format of the book and other mediums. (SP)

141. Temporal Structures: Video and Performance Art. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 or equivalents. Projects are aimed at understanding and inventing ways in which time and change can become key elements in the artwork. Regular screenings of professional tapes will illustrate uses of the mediums and provide a historical context. (F)

150. Art Analysis. (3) Two 1½-hour lectures per week. Prerequisites: 10, 12, and 14 or equivalents, and two courses in History of Art. Formerly 120 and 121. The evolution and comparison of historical and contemporary modes of composition and their relationship to underlying aesthetic ideas and philosophies. Required of all art majors. (SP)

155. Upper Division Seminar: Theory and Criticism. (3) Course may be repeated for credit. Two 1½-hour periods per week. Prerequisites: 10, 12, and 14 or equivalents. This course provides a forum for discourse on theories of contemporary art-making as well as modes of criticism. It is intended to help students develop their skill in thinking analytically and in articulating their perceptions of works of art. (SP)

H195A-H195B, Special Study for Honors Candidates in the Practice of Art. (3-5) May be applied to toward upper division departmental major requirements. Individual hours to be arranged. Prerequisites: Eligibility for admission to the Honors Program. Honors students are limited to 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) May not count toward the art major. Course may be repeated for credit. Individual hours to be arranged. Must be taken on a passed/no passed basis. (F, SP)

Graduate Courses

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

*Not offered 1991–92
*On leave, spring, fall
*On leave, fall

200. Advanced Problems in Drawing. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: 10, 12, and 14 or equivalents. Exploration of individualized problems/ideas in painting under supervision of instructor. Individual and group critiques of student work as well as presentations and discussion of related outside topics. (F, SP)

201. Advanced Workshop in Painting. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: Graduate standing and consent of instructor. Exploration of individualized problems/ideas in painting under supervision of instructor. Individual and group critiques of student work as well as presentations and discussion of related outside topics. (F, SP)

202. Advanced Workshop in Printmaking. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: Graduate standing and consent of instructor. Exploration of individualized problems/ideas in printmaking processes under supervision of instructor. Individual & group critiques of student work as well as presentations and discussion of related outside topics. (F, SP)

203. Advanced Workshop in Sculpture. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: Graduate standing and consent of instructor. Individual exploration of problems/ideas in sculpture using various materials. (F, SP)

216. Seminar: Issues and Ideas. (3) Course may be repeated for credit. One 3-hour open studio period per week. Prerequisites: Graduate standing and consent of instructor. Open to graduate students in History of Art. Students will be required to attend lectures given at the discretion of the instructor as well as critiques of student projects and independent research. (SP)

218. Seminar: Theory and Criticism. (3) Course may be repeated for credit. One 3-hour open studio period per week. Prerequisites: Graduate standing and consent of instructor. Exploration of artmaking in various non-traditional modes: video, photography, performance, site-specific installations, etc.; particular mode(s) and course content to be determined by instructor. Individual and group critiques of students' work as well as presentations and discussion of related outside material. (F, SP)

224. Seminar in Nontraditional Modes of Artmaking. (3) Course may be repeated for credit. Two 3-hour instructional studio periods and one 3-hour open studio period per week. Prerequisites: Graduate standing and consent of instructor. Individual and group exploration of artmaking in various non-traditional modes: video, photography, performance, site-specific installations, etc.; particular mode(s) and course content to be determined by instructor. Individual and group critiques of students' work as well as presentations and discussion of related outside material. (F, SP)

299. Supervised Independent Study for Graduate Students. (1-3) May be repeated for credit. Individual hours to be arranged. Prerequisites: Graduate standing and consent of instructor. Staff Committee members as well as other faculty. (F, SP)

299. Supervised Independent Study for Graduate Students. (1-3) May be repeated for credit. Individual hours to be arranged. Prerequisites: Graduate standing and consent of instructor. Staff Committee members as well as other faculty. (F, SP)

299. Supervised Independent Study for Graduate Students. (1-3) May be repeated for credit. Individual hours to be arranged. Prerequisites: Graduate standing and consent of instructor. Staff Committee members as well as other faculty. (F, SP)
History of Art

Office: 405 Doe Library, 642-5510
Chair: Loren Partridge

Professors:
1. Svatiina Alpera, Ph.D. Harvard University, 17th- and 18th-century art and the history of art. Michael Baxandall, M.A. Cambridge University, European art.
3. Timothy Clark, Ph.D. London University. Modern art. James Morrow, Ph.D. Columbia University. Late Gothic, Northern Renaissance art. Loren Partridge, Ph.D. Harvard University. Italian Renaissance.

Research Interests:

Associate Professors:
Carol Armstrong, Ph.D. Princeton University. Late 19th- and 20th-century European art.
Harvey Stahl, Ph.D. New York University, Institute of Fine Arts. Renaissance, Gothic, Late Byzantine art.
Anne M. Wagner, Ph.D. Harvard University. Modern art.

Major Program

The major provides a thorough education in the history of the visual arts in all major periods of western and Asian culture as well as the opportunity to do specialized study in areas of the student's choice. Fundamentally a humanistic inquiry and often multidisciplinary in approach, the program provides majors with essential training in those conceptual and historical, research and critical skills needed for many professions. Majors frequently go on to careers in business, law, or the arts 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 will consist of not fewer than 12 courses, and shall include the following:

1. One course in the practice of art; 
2. Two lower division survey courses in the history of western art (10A: Ancient to Medieval; and 10B: Renaissance to Modern); 
3. One course in Asian art (either a lower division survey of an upper division course); 
4. Three upper division lecture courses in three of the four areas of western art: Ancient, Medieval, Renaissance-Baroque, and Modern; 
5. One seminar; 
6. One upper division course in history relating to the student's major field of interest (may substitute a course in another department with prior consent of adviser); 
7. Three more upper division courses, one of which must be in the History of Art Department; the others may be chosen from the following range of possibilities:
   a) additional art history courses, including upper division lecture courses, seminars, and courses in the 190 series; 
   b) additional courses in related disciplines—beyond the requirement in part 6 above; 
   c) additional courses in the practice of art; 
   d) courses that deal primarily with art or architectural history but are taught in other departments, such as Near Eastern Studies, Environmental Design, Classics, etc. Courses outside the department (options b,c,d) must be approved by the undergraduate adviser.

Honors Program.

Students with at least a 3.3 grade-point average both overall and in all upper division courses completed in the major are eligible for admission into the Honors Program. Candidates for Honors in the History of Art are required to complete a satisfactory Honors Project by the end of their senior year. An Honors Project, normally a thesis, consists of at least two semesters of continuing academic work under faculty supervision. The first semester is usually a seminar, directed research, or independent study course; work done in History of Art 192 or in another upper division course requiring an acceptable research paper may also be counted as the first semester project. The second semester is taken as History of Art H195. Those who have completed the program will graduate with Honors, High Honors, or Highest Honors in the major department. Students of the History of Art may complete their final GPA in upper division art history courses. Applications, which require the signature of the project director and undergraduate major adviser, are available in the History of Art office.

Minor Program

Required: Five upper division courses in three of the following five areas: Asian (130s), Ancient (140s), Medieval (150s), Renaissance-Baroque (160s-170s), and Modern (180s). One course may be a seminar (150). 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 taken at Berkeley.

Recommended: History of Art 10A and 10B, and one Practice of Art course, preferably drawing.

Graduate Study

The department offers two degree programs:

M.A./Ph.D. Program.

A two-stage integrated master's and doctoral program in preparation for college teaching, advanced research, and specialized curatorial careers. Students are not admitted to the program at Berkeley. All courses must be taken for letter grades. An overall GPA of 2.0 is required in all courses applied to the requirements for Stage I of the M.A./Ph.D. program.

M.A./M.L.I.S. Program.

A concurrent program with the School of Library and Information Studies to prepare students for careers in art librarianship.

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 in the history of art, their expectations for graduate study at Berkeley, and their professional goals.

2. Post-M.A. Transfer Students. Students applying for admission must hold an M.A. degree in history of art or a closely related field from another institution and 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, interests in the history of art, their expectations for graduate study at Berkeley, and their professional 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 below, Languages). It is strongly urged that students do everything possible to satisfy both language requirements before entering the program. The summer before enrolling is particularly recommended as a time to improve language proficiency.

5. Graduate Division Requirements. Each applicant is 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 five areas: Ancient, Medieval, Renaissance, Baroque (1600-1800), and Modern (1800-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 two of the three Asian areas 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 at the graduate level, including three research seminars. One course may be taken 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; the seminar designed especially for first-year graduate students (History of Art 200); additional graduate seminars inside or outside the department; and 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 upper division undergraduate course, the pre-seminar designed especially for first-year graduate students (History of Art 200); and one major Asian language (normally Chinese, Japanese, Sanskrit, or Hindi).

4. Qualifying Paper or M.A. Thesis. The qualifying paper is a perfected version of a seminar paper, normally no longer than 50 pages including footnotes and bibliography. It should demonstrate the scholar's competence in the investigation of a limited problem. The qualifying paper is read and approved by three regular faculty members. If the paper is not completed by the end of the third week of instruction in whichever semester (fall or spring) the degree is expected. All degrees are awarded in December or May.

5. Graduate Student Instructors (GSIs). Since teaching is considered an important part of graduate training, each student in the program will normally serve at least once as a teaching assistant. 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 a certain amount of experience as teaching assistants elsewhere. To qualify as a GSI, students in Western art must have satisfied both language requirements and all students must
have made up any incompletes by the time teaching is to begin.

6. Length of Stage I. For students in Western art, good progress is two years, or two years and a summer; for Asian or Classical art, three years. (Although many students do file for and receive the M.A. degree, although many students do file for and receive the M.A. degree, although many students do file for and receive the M.A. degree. Three years is to begin.

7. Annual Review of Ph.D. Candidates. All doctoral students at the dissertation stage must meet annually with at least two members of the dissertation committee. The purpose 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. Length of Stage II. Good progress is one year to the passing of the qualifying examination, plus three additional years for research and completion of the doctoral dissertation. (Total time for Stage I and Stage II is six to seven years.)

Requirements for Completion of M.A./M.L.I.S. Program
1. Requirements for the History of Art component of this concurrent degree program is identical to those of Stage I of the graduate program, except that one less upper division course is required. Students must complete History of Art 200 in their first semester of study and then fulfill the History of Art requirements. It is recommended, however, that a special bibliography committee be appointed for courses in history of art. In the third year students fulfill the remainder of their lib- rarianship requirements for a total of 28 units. These courses should be chosen in consultation with the faculty of the School of Library and Information Studies, but must include Cata- loging and Classification (L 210) and one of the following courses: Information Services in Organizations (L 261), Public Libraries (L 262), Work with Children and Young Adults in School and Public Libraries (L 264), or College and University Libraries (L 266). Two library service courses can be combined with on-site activities in the History of Art collections: Organization of Non- Book Materials (L 211) in the slide and photo- graphic archive, and Evaluation of Reference Services (L 257) in the Art History/Classics Graduate Service.

2. Normative time for students in the M.A./M.L.I.S. program is three years.

Further information concerning the programs above may be obtained from the Graduate Assist- ant, History of Art Department, 405 Doe Library, University of California at Berkeley; Berkeley, CA 94720.

University Art Museum
The University Art Museum plays an active role in instruction and research, giving students an opportunity for experience in connoisseurship and organization of exhibitions. (The University Art Mu- seum in Index for further information.)

Lower Division Courses
10. History of Western Art. (4) Three hours of lecture and one hour discussion per week. Prerequisites:

- Not offered 1991-92
- On leave: spring, fall
- On leave: fall

- Possible the two courses should be taken consecu- tively, fall before spring. An historical survey of selected works of painting, sculpture, and architecture to the end of the 15th century. The course may serve as an introduction to the major artistic movements in Western art as well as to the study of history of art. Stress is placed on the acquisition of perceptual and interpretive skills, the analysis of style and meaning, and the ability to relate works to a broader visual tradition and historical context. (F)

10A. Ancient to Medieval. (4) (F) Stahl, Stewart
10B. Renaissance to Modern. (4) (SP) Alpers, Arm- strong

**The Arts of Asia: India, China, and Japan.** (4) Three hours of lecture and one hour of discussion per week. A survey of selected works of sculpture, prints, and painting from India, China, and Japan. The course is intended to serve as an introduction to basic art-historical issues and methodology as well as to provide a cultural and historical per- spective for understanding the great monuments of East Asian art.

39. Freshman Seminar. (4) Course may be repeated for credit with a different instructor. Three hours of seminar per week. Topics vary. For descriptions of current offerings, consult the Departmental listing in 405 Doe.

61. Introduction to the History of Art: Sculpture. (4) Three hours of lecture and one 2-hour discussion per week. Selected examples of sculpture emphasizing the human figure, including portraits and narrative reliefs, from ancient Egypt to modern America.

62. Introduction to Italian Renaissance Art. (4) Three hours of lecture and one hour of discussion per week. In-depth study of a limited number of fourteenth, fifteenth, and sixteenth century masterpieces of Italian Renaissance painting, sculpture, and architecture created in Florence, Rome, Venice, and the Italian courts.

81. Introduction to Modern Art (for Non-Majors). (4) Designed for students with no previous study of the visual arts. One 2-hour lecture and one 2-hour dis- cussion per week. Selective survey of major develop- ments in painting, sculpture, graphic arts, photograph- ry, architecture and design, primarily from about 1890 to about 1960. Emphasizes on detailed analysis of examples in the Bay Area, on developing critical and writing skills.

Upper Division Courses
Open to nonmajors. General prerequisite: Upper Division course or consent of the instructor. Un- less otherwise stated, the "A" part of a sequence is not prerequisite to the "B" part.

*130A. Early Chinese Art, Part I (L) Three hours of lecture and one hour per week. Chinese art of the Neolithic and Bronze Age. From the earliest pe- riod to the end of the Han dynasty (early third century A.D.), especially ceramics, bronzes, jades, and lacquer.

130B. Early Chinese Art, Part II (L) Three hours of lecture and one hour per week. Chinese art in the medieval period: Six Dynasties through Sung Dynasty (third-thirteenth centuries A.D.), especially ceramics, bronzes, jades, and lacquer.

131A. Early Chinese Painting. (4) Three hours of lecture and one hour per week. The history of Chinese pictorial art and painting from the begin- ning of the late Chou dynasty to the Sung dyna- sty (4th century B.C. to ca. A.D. 1270), with concentra- tion on the later periods (10th-13th centuries). (F) Cahill

131B. Later Chinese Painting. (4) Three hours of lecture and one hour per week. The history of Chinese pictorial art and painting from the begin- ning of the late Chou dynasty to the Sung dyna- sty (10th-13th centuries). (SP) Cahill

131C. Modern Chinese Painting. (4) Three hours of lecture and one hour per week. The his- tory of Chinese painting from the beginning of the Ch'i dynasty (1644-1912) to the present. For recent

3On leave, spring
4Recalled to active service
5Recipient of Distinguished Teaching Award
decades, painting done both inside and outside China will be treated, but only work in the traditional materials and techniques (hua-hua).

113. Arts of Japan. (4) Three 1-hour lectures and one 1-hour discussion section per week. A historical survey of the major works and periods. The three main topics within a careful survey are Buddhist painting; narrative handscrolls; and painting in the Zen milieu.

113A. Japanese Painting to 1600. (4) Three hours of lecture and one hour of section per week. There are three major themes: decorative screenpainting (in its architectural context); genre painting and ukiyo-e; and literati painting (banjin-ga).

113B. The Art of India, Indus Valley Through 550 A.D. (4) Three hours of lecture and one hour of section per week. A survey of Hindu survey of Hindu and Buddhist architecture and sculpture in India from the sixth to the fourteenth centuries. (SP) Williams

113C. The Art of India, 1350 A.D. to the Present. (4) Three hours of lecture and one hour of discussion per week. A selective survey of major developments in Muslim and Non-Indian painting from 1350 to the present. (F) Williams

113T. The Art of Southeast Asia. (4) Three hours of lecture and one hour of section per week. A survey of Cambodian, Thai, 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. (F) Williams

114. Aegean Art. (4) Three hours of lecture and one hour of discussion per week. The art of Crete and Greece in the Bronze Age, with attention to connections with neighboring cultures. Stewart

114A. Greek Sculpture and Painting. (4) Three hours of lecture and one hour of discussion per week. In addition to close study of the major works, particular emphasis upon their cultural context and upon key issues such as narrative strategies, modes of address in sculpture and painting, political propaganda in art and the rise of the creative artist. Special attention, wherever possible, will be paid to newly-discovered work. (F) Hart

114B. Classical Greek Art (570-480 B.C.). (4) Three hours of lecture and one hour of discussion per week. The painting, sculpture and architecture of the Greek world from the age of Homer to the Persian Invasions. In addition to close study of the major works, particular emphasis upon their cultural context and upon key issues such as narrative strategies, modes of address in sculpture and painting, political propaganda in art and the rise of the creative artist. Special attention, wherever possible, will be paid to newly-discovered work. (SP) Stewart

114C. Hellenistic Art (330-30 B.C.). (4) Three hours of lecture and one hour of discussion per week. The painting, sculpture, and architecture of the Greek world from Alexander to Cleopatra. In addition to close study of the major works, particular emphasis upon their cultural context and upon key issues such as narrative strategies, modes of address in sculpture and painting, political propaganda in art and the rise of the creative artist. Special attention, wherever possible, will be paid to newly-discovered work. (BP) de Caso

115. Roman Art. (4) Two 2-hour lectures per week. The art of Rome and the Roman Empire, from its sources in the Republican era to the Age of Constantine the Great.

115A. Medieval Art. (4) Two 2-hour lectures per week. Medieval art about to 1050.

115B. Medieval Art. (4) Two 2-hour lectures per week. Medieval art after 1050.

115C. Early Gothic Art. (4) Three hours of lecture and one hour of discussion per week. Gothic art and architecture from its origins in France about 1130 to its triumph in the international pre-eminence of the fourteenth century. The related developments of architecture, sculpture, and stained glass at the major cathedrals are closely examined, as well as the evolution of pictorial & narrative styles in religious and secular illustration.

115D. The Illuminated Book in Northern Europe: 13th-16th Centuries. (4) Three hours of lecture and one hour of discussion per week. Late Gothic manuscript illumination in Northern Europe, chiefly in France and the Low Countries. Topics include types of illuminated books and their traditions of illustration, relations of book illumination to other media, and changing aesthetics within the medium itself.

116. Italian Renaissance Art. (4) Three hours of lecture and one hour of discussion per week. Each course covers all media—painting, sculpture, architecture—and is organized topically: urbanism, fortifications, churches, chapels, palaces, villas, altarpieces, portraits, fresco decoration, tombs, public sculpture, festival decoration, etc. The works of art are interpreted in terms of style, iconography, function, setting, patronage and cultural context. (F) Partridge

160A. The Fourteenth Century. (4)

160B. The Italian Courts, 15th and 16th Centuries. (4)

160C. Florence and Tuscany, 15th Century. (4)

160D. Florence and Tuscany, 16th Century. (4)

160E. Rome and Central Italy, 15th Century. (4)

160F. Rome and Central Italy, 16th Century. (4)

160G. Venice and the Veneto, 15th Century. (4)

160H. Venice and the Veneto, 16th Century. (4) (SP)

162. Italian Art and Its Circumstances 1400-1527. (4) Three hours of lecture and one hour of discussion per week. The course studies the cultural environment of Italian painting and sculpture from about 1400 to about 1527. The major topics are artists' career patterns; mechanisms of patronage (concrete, individual court); subject-matters, religious and secular; physical techniques; intellectual techniques; mediation between high culture (literature, mathematics, science) and art; contemporary reception in Italy; contemporary reception abroad; modern view of the Renaissance since Burchardt.

166. Early Netherlandish Painting. (4) Three hours of lecture and one hour of discussion per week. Survey of Franco-Flemish and Early Netherlandish painting from ca. 1250-1525. Major artists treated monographically (Jean Pucelle, the Limbourg brothers, Rogier van der Weyden, Jan van Eyck, Rogier van der Weyden, Hugo van der Goes, Hieronymus Bosch, and others) but emphasis is also placed on the changing functions of art during the transition from the late medieval to the early Renaissance periods in the North. (F) Marlow

168. German Painting, 1530-1550. (4) Three hours of lecture and one hour of discussion per week. Survey of the development of German painting in the late Middle Ages and the Early Renaissance. Major artists treated monographically (e.g., Lochner, Witz, Schongauer, Durer, Grunewald, Altdorfer, Cranach).

170. Southern Baroque Art. (4) Three hours of lecture and one hour of discussion per week. A general survey of Netherlandish painting of the seventeenth century organized according to the genres or types of painting done at the time. The historical and social as well as the art historical contexts for the development in the Netherlands of such genres as history painting, landscape, still-life, and the kinds of meanings with which they were endowed.

175. Rubens, Rembrandt, and Vermeer. (4) Three hours of lecture and one hour of discussion per week. The works of these three leading painters in the north will be contrasted and used to introduce the major concerns of northern artists of the time.

180A. Modern art: Neoclassicism and Romanticism, 1770-1830. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Upper division standing and consent of instructor. The course will address major developments in the history of European art during the Age of Revolution, with emphasis on French and English painting. Equal importance will be given to the study of selected artists and works and to that of artistic movements considered in their historical and intellectual context. Architecture and sculpture will be considered in as much as they shed light on the major artistic concerns of the period (revolutionary architecture, the picturesque garden, etc.)

180B. Sculpture in 19th Century France. (4) Two 1-hour lectures and one hour of discussion per week. Prerequisites: Upper division on course in European art- late 18th C to late 19th C or one upper division course in 19th C history or literature, preferably French. Non UCB courses subject to instructor's approval. The course will discuss the transformation of sculpture in France in all of its aspects between the First and the Third Republic (approximately 1792-1870), ending with the emergence of Rodin's art. It will comprise a study of major works and major issues and will address the numerous theoretical, critical and social issues that account for the thematic and stylistic changes of sculpture during the 19th century. (de Caso)

180D. Rodin and His Time. (4) Three hours of lecture and one hour of discussion per week. A study of the art of Rodin from 1840 to 1917 and its role in the transformation of sculpture and the art of the Symbolist and Art Nouveau periods. Monuments and other works considered in involvement in architecture, draughtsmanship and criticism. (SP) de Caso

181. Contemporary Art. (4) Three hours of lecture and one hour of discussion per week. Painting and sculpture in America and Europe from World War II to the present.
192A. The Beginnings of Modernism: French Painting from 1848 to 1900. (4) Two 1½-hour lectures and one 1-hour section per week. The topic of this course is the history of French painting from 1848 to 1900: the formation of the avant-garde and the formulation of the modernist aesthetic—within the social context of later nineteenth century France.

192B. Modernism in Europe 1900-1939. (4) Three hours of lecture and one hour of discussion per week. A survey of the international avant-gardes prior to and between the two world wars: representational and anti-representational practices and strategies in painting, sculpture, and decorative arts of colonial and early Federal periods. Focus on specific issues of technology, culture, and style as well as on a chronologically overview.

193A. British and American Art (1550-1800) Survey I. (4) Three hours of lecture and one hour of discussion per week. A survey of the history of the British and American art, with emphasis on the role of the city and its surrounding areas. Focus on specific issues of technology, culture, and style as well as on a chronologically overview.

193B. American Art Survey II (1800-Preseent). (4) Three hours of lecture and one hour per week. A survey of the major developments in American architecture, decorative arts, photography, and painting from Americanism to post-modernism, focusing on the academic and vernacular traditions and introducing issues of representation and audience. Field trips to local museums.

194. American Architecture: Domestic Forms. (4) Three hours of lecture and one hour of discussion per week. Both vernacular and high-style architectural forms and their relationship to the history and culture of America. Focus on specific issues of technology, style, and of social use. Field trips.

195. Twentieth-Century Sculpture. (4) Three hours of lecture and one hour of discussion per week. Sculpture from Rodin to the present.

196. American Art: 20th Century. (4) Three hours of lecture and one hour of discussion per week. From Thomas Eakins to the present.

197A. American and Bay Area Architecture. (4) Three hours of lecture and one 2-hour field trip per week. The lectures will trace the major trends in the history of American architecture from the colonial period to the present. In the field trips, individual buildings and the urban development of the Bay Area will be studied and related to the nationwide developments.

198. Special Topics in Various Fields of Art History. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Topics of concern to the instructor, usually related to current research projects which may fall outside of the normal curriculum or be of more restricted content than regular lecture courses. Primarily intended for advanced undergraduate majors and graduates in History of Art, but open to others. For specific topics and enrollment, see listings outside of 405 Doe. (F,SP) Staff

199A. Asian. (4)
199B. Ancient. (4)
190C. Medieval. (4) (SP) Stahl
190D. Renaissance-Baroque. (4)
190E. Modern. (4) (F,SP) Clark, Wagner

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 with major status or consent of the instructor. Concentration on specific problems or works in a particular area of History of Art. Assigned readings, discussion and a substantial paper. For specific topics and enrollment, see listings outside of 405 Doe. (F)

192A. Asian. (4) (F,SP) Cahill, Williams
192B. Ancient. (4) (F) Stewart
192C. Medieval. (4) (SP) Morrow, Stahl
192D. Renaissance—Baroque. (4)
192E. Modern. (4) (F,SP) Staff

192F. Museum Studies. (4) *192G. American and British. (4)

193. Directed Research. (4) Three conference hours per week and substantial paper. Prerequisites: Consent of instructor and departmental advisor. Intended for advanced undergraduates wishing to continue research in the field in a seminar 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 195; for honors research, see H195. (F,SP) Staff

194. Museum Internship. (4) Course may be repeated for credit. Ten hours of fieldwork per week plus conferences. Prerequisites: Approval of undergraduate advisor and department chair. 192F recommended. Study and practical professional experience, usually for no less than ten hours per week, including 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 must ordinarily be arranged in advance; for further information, inquire at 405 Doe. (F,SP) Staff

H195. Special Study for Honors Candidates in the History of Art. (1-4) Individual conferences. Prerequisites: Senior standing and qualifying scholastic record (3.3 GPA overall and 3.3 GPA in courses completed in major) and leading to the preparation of the honors thesis. Consult the description of Honors Program in Art History. (F,SP) Staff

196. Undergraduate Proseminar. (4) Three hours of seminar per week plus extensive outside work. Prerequisites: Junior or Senior with major status or consent of instructor. An introduction to the study of the history of art, with an emphasis on the importance of art in contemporary society. For continuing or advanced research projects, see 193. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor, major advisor and department chairman. For students wishing to pursue an interest not represented 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. (F,SP) Staff

Graduate Courses

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

200. Graduate Proseminar in the Interpretation of Art Historical Materials. (4) 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 innovative perspectives designed for 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. (F) Partridge

200X. Special Topics: Short Course. (2) Course may be repeated for credit. Four hours of lecture and seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Ability to participate in intensive study. Bibliography in Chinese, Japanese and western language sources will be treated, but the emphasis will be in materials in Chinese.

230. Seminar in Chinese Art. (4) May be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor. (SP) Cahill

234. Seminar in Japanese Art. (4) May be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor. (F) Williams

240. Seminar in Ancient Art. (4) May be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor. (F) Williams

244. Seminar in Roman Art. (4) May be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor. (F) Wright

254. Seminar in Early Medieval Art. (4) May be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor. (F) Marrow

257. Seminar in Romanesque and Gothic Art. (4) May be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor. (F) Stahl

262. Graduate Seminar in European Art 1400-1800. (4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor. (SP) Baxandall

265. Seminar in Northern Renaissance Art. (4) May be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor.

270. Seminar in Baroque Art. (4) May be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor. (SP) Alpers

275. Graduate Seminar in 18th Century Art. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Graduate Standing and consent of instructor. Analysis of 18th century art/painting.

281. Seminar in French 19th Century Art. (4) May be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor.

285. Seminar in Late 19th- /Early 20th-Century Art. (4) May be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor. This seminar deals in topics drawn from the history of French painting and photography from 1848 to 1914. Other media and national traditions of this period are also covered when relevant. Emphasis is placed on interdisciplinary approaches and issues of methodology. (F,SP) Staff

286. Seminar in 20th-Century Painting and Sculpture. (4) May be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor.

288. Seminar in English Art. (4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. Prerequisites: Graduate standing and consent of instructor. (SP) Cahill

On leave, spring
Recipieent of Distinguished Teaching Award

*Not offered 1991-92
On leave, spring, fall
On leave, fall

Art and History of Art / 115
Asian American Studies
(Special Studies or College of Letters and Science)

Program Office: 3407 Dwinelle Hall, 642-6555
Coordinator: L. Ling-chi Wang, M.A.

Professors:
Evelyn N. Glenn, Ph.D.
Elaine H. Kim, Ph.D.
Hiroshi T. Takaki, Ph.D.

Associate Professors:
L. Ling-chi Wang, M.A.

Assistant Professors:
Amado Y. Cabasea, Ph.D.
Michael A. Ohm, Ph.D.
Saul-ling C. Wong, Ph.D.

Lecturer:
Chuong H. Chung, M.A.

Undergraduate Major Advisers: Mr. Mang, Ms. Megino.

Choice of Program
A student can complete the major in Asian American studies in the College of Letters and Science or in the Department of Ethnic Studies, each with an A.B. degree. Students in each program are subject to the requirements of the respective college or department.

Undergraduate Program
The Asian American Studies Program offers a unified and comprehensive undergraduate curriculum which seeks 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 upon the curricula of such schools and departments as Education, Public Health, Law, and Sociology. The program itself offers instruction in those areas relating to the special needs of Asian American communities. Second, the program explores the historical and cultural aspects of the Asian American experience. In doing so, it provides the undergraduate with thorough instruction on the experience of Asians in the United States, and prepares students for graduate work in their own and allied fields. Third, the program broadens the curriculum at Berkeley to include instruction which reflects the conditions of Asian and other third world people living in America.

Breadth Requirements—Special Studies. (For College of Letters and Science breadth requirements, see the college announcement.) Five courses outside the Department of Ethnic Studies, two of which must be at the upper division level, including: (1) One course in computer literacy; (2) One course in each of the following areas: humanities, social science, and natural science.

The Major
Lower Division. The student seeking to major in Asian American studies must either have satisfied or be in the process of satisfying the following: (1) Reading and Composition (Asian American Studies 2A-2B, English 1A-1B, or equivalent); (2) Asian American Community Language or Spanish (one year); (3) 20A; (4) 20B or 20C; (5) Ethnic Studies 20; (6) two courses related to the major, offered outside of the Department of Ethnic Studies, in either the humanities or social sciences (subject to the approval of the major adviser).

Upper Division. (1) Asian American Studies 120, 145, 165, and one of the 192 courses (or Ethnic Studies 195); (2) Ethnic Studies 130; (3) Two courses in Asian American Studies; (4) Two courses in Ethnic Studies (Chicano Studies, Ethnic Studies, Native American Studies) or Afro-American Studies; (5) Field Studies 197—six units (cumulative).

Honor. The Asian American Studies Program will provide a program leading to the A.B. degree with honors. A student will be recommended for honors if: (1) the student has completed at least 30 units and two semesters with a grade-point average of at least 3.3 for all work undertaken in the Asian American Studies Program and has been approved specifically for honors by the Ethnic Studies Department chair and the Asian American Studies Coordinator upon the recommendation by the faculty adviser for the major. The honors student will be required to complete H195 Senior Honors Seminar for Asian American Studies Majors. In order to graduate with an A.B. degree with honors, a student must obtain at least a 3.3 GPA for all course work undertaken at the University.

The Minor
Requirements: One lower division course and five upper division courses.
1) Lower division: One course: Asian American Studies 20A or 20B.
2) Upper division: Five courses:
   a) History: One course: Asian American Studies 120-129, 151, or 192A
   b) Issues: One course: Asian American Studies 141-149, 165, 166, or 192B
   c) Humanities: One course: Asian American Studies 172, 173, 180, or 192C
   d) Electives: Two courses in Asian American Studies

Lower Division Courses
1. Basic Reading and Composition. (2) Three 1-hour lectures and one 1-hour tutorial per week. This course develops basic skills in academic essay-writing and fosters productive writing habits by providing intensive writing practice on a variety of issues relevant to Asian Americans. Topics include: ethnic identity, language and communication, racism, stereotyping, sex roles, family relationships, career choices, etc. A grade of C or higher fulfills the Subject A requirement. Two units recorded credit but recognized as four units of workload in computing study lists. (F,SP) Staff
2. Reading and Composition. (4) Three 1-hour lectures and one 1-hour tutorial per week. Prerequisites: 1, Subject A or equivalent. Through the study of the literary, political, social and psychological dimensions of representative works of Asian American literature, this course introduces students to close textual analysis, fosters critical judgment, and reinforces academic writing skills. (F,SP) Staff
3. Reading and Composition. (3) Three 1-hour lectures and one 1-hour tutorial per week. Prerequisites: 1, English 1A or equivalent. This course examines literature by Asian American, Afro-American, Chicano and Native American writers in their political and social contexts, focusing on similarities and differences between the experiences of ethnic minorities in the U.S. Emphasis is on literary interpretation and sustained analytical writing. (F,SP) Staff
4. Introduction to the History of Asians in the United States. (4) Three 1-hour lectures and one 1-hour discussion per week. Introductory comparative analysis of the Asian American experience from 1848 to present. Topics include: an analysis of the Asian American perspective; cultural roots; immigration and settlement patterns; labor, legal, political, and social history. (F,SP) Kim, Takaki
5. Introduction to the Contemporary Issues in the Asian American Community. (4) Three 1-hour lectures and one 1-hour discussion per week. Introduction to Asian American communities covering the
evolution of social, economic, and political institutions of Asian American communities and their relationship to the larger American Society. Course employs race and class analysis. (F) Ceballos

20C. Introduction to the Culture of Asians in the United States. (4) Two 1½-hour lectures and one 1-hour discussion per week. An analysis of the intellectual and artistic activity characteristic of Asian American communities. Focus will be on the arts, social patterns, and expression (e.g. language and literature) reflecting the historical aspects and political concerns which influence the culture. (SP) Staff

Upper Division Courses

120. Comparative History of Asian Experience in American Society. (4) Two 1½-hour lectures or one 1-hour seminar per week. Prerequisites: 20A. Analysis of the similarities and dissimilarities of the Asian experience in America; methods of comparative approach to Asian American history were common Asian experiences in areas such as immigration, labor, economic development, race relations, community institutions and development, occupational patterns will be analyzed and compared. (SP) Takaki

121. History of the Chinese in the U.S. (4) Three 1-hour lectures and one 1-hour discussion per week. Prerequisites: 20A. Chinese American history, 1848 to present. Topics include influence of traditional values, Eastern and Western; patterns of immigration and settlement by history; the influence of public policy, foreign and domestic on the Chinese individual and community. (SP) Wang

122. Japanese American History. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A. This course will be presented as a proseminal with selected topics in order to give students an opportunity to participate in the dynamics of the study of Japanese American history. Topics include immigration, anti-Japanese racism, labor, concentration camps, agriculture, art and literature, and personal experiences. (SP) Staff

123. Korean American History. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A. Koreans in America from 1876 to the present. Topics include: comparative immigration and settlement patterns; labor and socioeconomic life; political activities; community organization; and issues related to the contemporary population influx. (SP) Staff

124. Filipino American History. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A. Topics include: consequences of the Spanish American War on Philippine emigration; conditions in Hawaii and California and the need for Filipino labor; community development; changing relations between the U.S. and the Philippines; effects of independence movement and World War II on Filipino Americans; and contemporary issues. (SP) Staff

125. Socio-Economic and Educational Issues of Southeast Asians in the U.S. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or consent of instructor. An analysis of the contemporary issues in the Southeast Asian American community. Topics include: socio-economic adaptation, education, and political organizations. This course is designed to acquaint the student with the resources available to Southeast Asian Americans and to provide an understanding of the role of education in the process of adaptation. (SP) Staff

126. Southeast Asian Migration: From Tradition to Resettlement. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A. A study of the characteristics of Southeast Asian migration and resettlement in the U.S. with special focus on the effects of the war and the role of cultural traditions in the adaptation of Southeast Asians to American society. (SP) Staff

127. South Asian American Historical and Contemporary Issues. (4) Course may be repeated for credit. Two 1½ hour lectures per week. Prerequisites: 20A or consent of instructor. Examines immigration and social history of Indians and Pakistanis in the U.S. from beginning 20th century to present. Development of South Asian American communities within the social, political and economic issues in South Asia and the U.S. (F) Staff

128. The Peoples of Hawaii: A Comparative Historical Analysis. (3) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A. A comparative historical study of the experiences of Asians and Pacific Islanders in Hawaii from 1778 or the arrival of Captain James Cook to the present. Readings and lectures will examine immigration, labor, culture, politics, and economic developments in the islands.

130. Asian American Experience and U.S. Foreign Policy. (3) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A. An analysis of the impact of U.S. foreign policy toward East and Southeast Asian countries on the formation and development of Chinese, Filipino, Indo-Chinese, Japanese, and Korean communities with emphasis on such issues as race relations, cultural nationalism, national security and internal political dynamics.

141. Law in the Asian American Community. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A. An analysis of the role of American law, procedure, and process in the Asian American community. The course focuses on the legal system and its impact on the Asian American community. May be taken with 197. (F) Staff

142. Asian American Psychology. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or 20B. This course is designed to acquaint the students with the basic understanding of the concepts relevant to the mental health of Asian Americans with particular emphasis on the service delivery aspect. It attempts to correct the traditional deficiencies in the curricula, which fail to focus on the role of Asian American in the Asian American communities in the area. May be taken with 197.

143. Asian American Employment Patterns and Issues. (3) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or 20B or consent of instructor. An analysis of the empirical realities of Asian American labor and examine some of the different strategies for approaching the problems of employment, underemployment, exploitation, affirmative action, etc. (SP) Staff

144. Language, Ethnicity and Society: Asian American Language Issues. (3) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or 20B or consent of instructor. Language needs and problems of Asian American, linguistics, psycholinguistics, and sociolinguistic factors affecting acquisition of English and maintenance of native language; language and cultural identity; implications for research, resource development, classroom teaching, and educational policy-making.

145. American Political Institutions and the Asian American Communities. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or 20B. An examination of the purpose, power, and function of the executive, legislative and judicial branches of the federal government and their relations to the Asian American community. The course presents a range of contemporary issues to illustrate how government, community, and individual define issues and respond to political challenges. (SP) Staff

146. Housing and Community Development in the Asian American Community. (3) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or 20B. This course examines housing-related institutions and processes in Asian American communities; housing policies and programs of federal and state agencies; urban renewal policies have come to bear on Bay Area Asian American community projects will be covered. May be taken with 197.

147. Asian American Literature. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or 20B or consent of instructor. Approaches to research in the Asian American community with emphasis on the San Francisco Bay Area. Problems of research design, measurement, and data collection, processing and analysis, will be considered. (SP) Kim

150. Asian American Family and Community. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or 20B. The influence of cultural legacies, ethnic background, community structure, class and economic status, and racism in the sociological and psychological dynamics of the Asian American family and personality. (SP) Staff

151. Asian Women in America. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or 20B. An analysis of events, forces, and movements affecting Asian women in America drawing from material in literature, history, philosophy, political science and other fields. Readings, reports, papers, and discussions. (SP) Kim

165. Analysis and Research in the Asian American Community. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or 20B. Approaches to research in the Asian American community with emphasis on the San Francisco Bay Area. Problems of research design, measurement, and data collection, processing and analysis, will be considered. (SP) Kim

166. Comparative Analysis of Asian American Communities. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or 20B or consent of instructor. This course will compare social organizations and institutions within Asian American communities. An analysis of the formation and development of social, political, and economic institutions as the basis for understanding the responses of Chinese, Japanese, Korean, Filipino, and new Asian immigrants to American race relations. (F) Staff

172. Asian American Literature. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 20A or 20B or consent of instructor. Approaches to representative works of Asian American literature by writers from the major ethnic subgroups; examines the works in their sociocultural context; analyzes thematic and methodological intertextuality to foster a coherent understanding of the Asian American literary tradition. (SP) Kim

173. Creative Writing. (4) One 2-hour lecture and one 3-hour writing lab per week. Prerequisites: 20A or 20B or 20C. Asian American writing as an expression of and contribution to Asian American culture: a study of issues facing minority American and Third World writers. Interpretation of themes, symbols, language, characterization, and community portrait in literary texts in forms and techniques of verse and prose writing. (F) Staff

180. Survey of Asian Immigrant Literature. (4) Course may be repeated for credit in different languages. Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: Two years Asian language or consent of instructor. Introduction to novels, short stories, poems, plays, and other literary writings of one of the following Asian immigrant groups: Chinese, Japanese, Korean, Filipino, and Vietnamese. Class will be conducted in one of the languages each time it is offered. (F) Wong

190. Seminar on Advanced Topics in Asian American Studies. (3) May be repeated for credit when topic changes. One 3-hour seminar per week. Prerequisites: Consent of instructor. Advanced seminar in Asian American Studies will be announced at the beginning of each semester. (SP) Wong

192A. Seminar on Asian American History. (3) Three hours of seminar per week. Prerequisites: 120 or consent of instructor. Advanced seminar in Asian American history for majors. Students will do original research on a historical topic or issues, and write a major paper.

192B. Seminar on Asian American Communities. (3) Three hours of seminar per week. Prerequisites: 165 or 166 or consent of instructor. Students will study Asian American community issues in relation to American social institutions. Through weekly seminars, readings, and supervised placements in local community organizations and agencies, students combine learning through field experience and academic work.

*On leave, spring
*On leave, spring
*On leave, fall

*Recipient of Distinguished Teaching Award
Topics such as race, class, political mobilization, and social change will be examined in relation to student field placements.

*192C. Seminar on Asian American Culture. (3) Three hours of seminar per week. Prerequisites: 172 or consent of instructor. A study of how Asian American history, tradition, family life, and community concerns are reflected and contributed to in Asian American art (including visual art), music, theatre, and literary art.

195. Senior Honors Seminar for Asian American Studies Majors. (3) Three hours of seminar per week. Prerequisites: 165 and consent of Instructor. Research seminar for senior Asian American Studies majors designed to support and guide the writing of a senior thesis. (F,SP) Staff

197. Field Study In Asian American Communities. (1-3) Course may be repeated for credit. Meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Formerly 197A-197B-197C-197D-197E-197F. Supervised community field study. Regular individual meetings with faculty sponsor and written reports required. (F,SP) Staff

198. Supervised Group Study. (1-3) Course may be repeated for credit. Meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Group discussion, research, and reporting on a topic. (F,SP) Staff

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Individual research on a topic which leads to the writing of a major paper. Regular meetings with faculty sponsor. (F,SP) Staff

Asian Studies

(College of Letters and Science)

Undergraduate Office: 207 Moses Hall, 643-5814
Graduate Office: 2229 Fulton Street, Room 228-242, 542-0339
Chair and Head Adviser: James Cahill
Advisers: Andrew Barshay (Department of History), James Cahill (Department of History of Art), George Deal (Department of Anthropology), Richard Holton (Haas School of Business), Padmanab Jain (Department of South and Southeast Asian Studies), Joyce Kalgren (Institute of East Asian Studies and Department of Political Science, UC Davis), Robert Reed (Department of Geography).

Group Major in Asian Studies

The undergraduate group major in Asian Studies is a rigorous but flexible interdisciplinary program designed to provide students with an Asian language, a broad range of interdisciplinary area-related course work, and at least a minimal familiarity with the methods of one discipline relevant to their area studies. The major program assists students by organizing the rich course offerings in the Asian field at the University in such a way as to 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).
2. At least two courses drawn from the following list. Since majors are required to select one discipline for the disciplinary focus, one of these introductory courses must be from the department in which the candidate for the major intends to fulfill this requirement:
   - Anthropology 2, Introduction to Archaeology
   - Anthropology 3, Introduction to Social and Cultural Anthropology
   - Economics 1, Introduction to Economics
   - Geography 1, Introduction to Physical Geography
   - Geography 4, Introduction to Cultural Geography
   - Geography 7, The Local and the Global
   - History 9A-9B-9C, Asian History
   - History of Art 30, The Arts of Asia: India, China, Japan
   - Political Science 2, Introduction to Comparative Politics
   - Political Science 3, Introduction to Empirical Analysis and Quantitative Methods
   - Political Science 4, Introduction to Political Theory
   - Sociology 1, Introduction to Sociology
   - Sociology 2, Sociology 172, Development and Modernization
   - Sociology 3, Sociology 183, Contemporary Chinese Society
   - Sociology 4, Sociology 183, Modern Chinese Society
   - Sociology 5, Sociology 183, Contemporary Chinese Society
   - Sociology 6, Sociology 183, Modern Chinese Society
   - Sociology 7, Sociology 183, Contemporary Chinese Society
   - Sociology 8, Sociology 183, Modern Chinese Society
   - Sociology 9, Sociology 183, Contemporary Chinese Society

3. One course from among the following: Anthropology 146, Comparative Peasant Society (4); Anthropology 148, Human Ecological Relationships (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 116A-116B-116C, China (4,4,4); History 117A-117B, Topics in Chinese History (4,4)

History of Art
1. History of Art 192A, Undergraduate Seminar: Problems in the Research and Interpretation in the Several Areas of the History of Art (4)
2. Two courses from among the following: History of Art 130A, 130B, Early Chinese Art (4,4); History of Art 131A, Early Chinese Painting (4); 131 B, Later Chinese Painting (4); 131C, Modern Chinese Painting (4)

Economics
1. One course treating the theories and/or methods appropriate to the discipline, chosen with the consent of the major adviser;
2. Economics 106, The Economics of Marxism (3)
3. Two other courses chosen with the consent of the major adviser.

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 120C, Communist International Relations (4); Political Science 140B, Comparative Communism (4); Political Science 140C, Selected Topics in Communist Politics (4); Political Science 143A, 143B, Northeast Asian Politics (4,4); Political Science 128A, 128B, The American Role in Asia (4,4)

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

Comparative Literature 160, Western Literary Cross-currents in Twentieth-Century China (3)
Legal Studies 161, Law in Chinese Society (4)
Music 134A, Music of the East Asia Tradition (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 Oriental Languages:

Oriental Languages (Chinese) 100A-100B, Advanced Chinese (5-5)
Oriental Languages (Chinese) 101, Readings in Modern Chinese (4); Oriental Languages (Chinese) 102, Survey of Chinese Literature (4)
Oriental Languages 116, The Classics of Chinese Philosophy (4)
Oriental Languages 121, Development of Buddhism in East and Inner Asia (4)
Oriental Languages 122, Buddhism and Contemporary Society (4)
Oriental Languages 131A-131B, Chinese Literature in Translation (4,4)
Oriental Languages (Chinese) 140, Readings in
Chinese Buddhist Texts (4);
Oriental Languages (Chinese) 154, Readings in Vernacular Chinese Literature (4); Oriental Languages 155, Readings in Later Medieval Poetry (4);
Oriental Languages (Chinese) 156, Readings in Chinese Vernacular Literature: Drama (4);
Oriental Languages (Chinese) 158, Modern Chinese Literature (4).

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

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 3 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 171, Japan (4);
3. One of the following courses: Anthropology 149, Culture and Personality (4); Anthropology 150, Social Problems in Changing Cultures (4); Anthropology 196, Undergraduate Seminar (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 118A-118B-118C, Japan (4,4,4); History 119A-119B, Topics in Japanese History (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 143A-143B, Northeast Asian Politics (4); Political Science 128A-128B, The American Role in Asia (4,4).

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 the following:

Geography 166, Japan and Korea (4);
History of Art 133, Arts of Japan (4); History of Art 134A, The Arts of the Japanese Temple (4); History of Art 135A-135B, Japanese Painting (4,4);
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 Oriental Languages:

Oriental Languages (Japanese) 100A-100B, Advanced Japanese (5,5); Oriental Languages 121, Development of Buddhism in East and Inner Asia (4); Oriental Languages 123, Buddhism and Contemporary Society (4); Oriental Languages (Japanese) 124, Classical Japanese Poetry (4); Oriental Languages (Japanese) 125, Hellenic Prose (4); Oriental Languages (Japanese) 126, Medieval Prose (4); Oriental Languages (Japanese) 127, Nikki Literature (4); Oriental Languages (Japanese) 128, Japanese Drama (4); Oriental Languages (Japanese) 129, Edo Literature (4); Oriental Languages (Japanese) 149A, 149B, Advanced Colloquial Japanese (4,4); Oriental Languages (Japanese) 155, Modern Japanese Literature (4); Oriental Languages (Japanese) 159, Contemporary Japanese Literature (4); Oriental Languages 133A-133B, Survey of Japanese Literature in Translation (4); Oriental Languages 134, Classical Women Writers of Japan (4).

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

Area III: Southeast Asia

A. The student must complete one additional year of Malay/Indonesian or Thai, or a second year of Dutch or French in the case that a relevant Asian language is not offered. It is to be noted that, in the case of Dutch, Thai, and Malay/Indonesian, all or a part of the first two years work carries upper division credit. In these two 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 3 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 185, Mainland Southeast Asia (4);
3. One course from among the following: Anthropology 146, Comparative Peasant Societies (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 164, The Classical Period of Indigenous Peoples (4); Geography 194, The City in the Third World (4); Geography 116, Economic Geography of the Non-Industrial World (4); Geography 107, Geography of Religions (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. Geography 160, Southeast Asia (4); Political Science 143C, Southeast Asian Politics (4); Political Science 143D, Policy Problems of Southeast Asia (4); Political Science 128A, 128B, The American Role in Asia (4,4).

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 the following:

History of Art 137, Art of Southeast Asia (4);
Music 133A, Music of the Southeast Asia Tradition (4);
Music: 134A, Music of the East Asia Tradition; 134B, Music of Japan

Oriental Languages: 121, Development of Budhism in East and Inner Asia; 122, Buddhism and Contemporary Society; 133A-133B, Japanese Literature in Translation; 134, Classical Women Writers of Japan

Political Science: 128A-128B, The American Role in Asia; 143A-143B, Northeast Asian Politics

Option III. Minor in Southeast Asian Studies.

Five upper division courses from among the following:

- Anthropology: 185, Mainland Southeast Asia; 186, Insular Southeast Asia
- Geography: 163, Southeast Asia
- History of Art: 137, The Art of Southeast Asia
- Music: 133A, Music of the Southeast Asia Tradition

Political Science: 128A-128B, The American Role in Asia; 143C, Southeast Asian Politics; 143D, Policy Problems in Southeast Asia

Southeast Asian Studies: 122, Authors and Audiences in the Malay World; 123, The Poetry of Indonesia and Malaysia
- 124, The Shadow Play in Southeast Asia; 128, Introduction to Modern Indonesian and Malay Literature

Graduate Program

The Group in Asian Studies offers an M.A. degree program in Asian studies. Students in the program emphasize one of four areas of Asia: East Asia (China), Northeast Asia (Japan/Korea), Southeast Asia, or South Asia. The group, in cooperation with the Graduate School of Journalism, the Graduate School of Business Administration, and the School of Law, respectively, also offers a concurrent M.J.U./M.A. or M.B.A./M.A. in business administration and Asian studies, and a concurrent J.D./M.A. in law and Asian Studies.

The group is authorized to award the degree of Doctor of Philosophy in Asian studies, but for practical and academic reasons this degree program is very restricted. Applicants with specific disciplinary interests should apply to a particular department rather than to the interdisciplinary group. Interested applicants should contact the Group in Asian Studies for additional information.

Lower Division Courses

1A-1B. Introductory Tagalog. (5/5) Five 1-hour classes per week. Formerly South & Southeast Asian Studies - Tagalog 1A-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)

Upper Division Courses

100A-100B. Intermediate Tagalog. (5/5) Five 1-hour classes per week. Prerequisites: 1A-1B or equivalent. Formerly South & Southeast Asian Studies - Tagalog 100A-100B. The goal of this course is to enable students to increase their proficiency in Tagalog to at least the intermediate level. Materials approved by the chair of the Group in Asian Studies will be used as a basis for vocabulary, grammar, and comprehension. The course will meet two hours per week. (F,SP)

H195A-H195B. Senior Honors. (3/3) Individual study supervised by two faculty members. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Open to seniors in the group major in Asian Studies with a minimum 3.5 in all upper division 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 a honors dissertation in close consultation with two members of the faculty. (F,SP)

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. Individual study supervised by appropriate faculty adviser. Prerequisites: Consent of instructor. (F,SP)

197. Field Study. (1-4) Course may be repeated for credit. Individual meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. (F,SP)

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

199. Independent Study. (1-4) Course may be repeated for credit. Individual meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Written proposal must be approved by instructor. Directed individual study on topics approved by the chair of the Group in Asian Studies. (F,SP)

Graduate Courses

200. The Pacific Rim. (4) One 3-hour 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 240. (F,SP)

286. 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)

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)

Astronomy (College of Letters and Science)

Department Office: 601 Campbell Hall, 642-5275

Professors:
- Jonathan Arau, Ph.D.
- Donald G. Backer, Ph.D.
- C. Stuart Bowyer, Ph.D.
- Marc Davis, Ph.D.
- Carl E. Heiles, Ph.D.
- Steven M. Kahn, Ph.D. (Physics)
- Ivan R. King, Ph.D.
- Christopher Kowal, Ph.D. (Physics)
- Jerry Nelson, Ph.D.
- Frank H. Shu, Ph.D.
- Joseph I. Silk, Ph.D.
- Hyron Spinrad, Ph.D.
- William J. Welch, Ph.D.
- Leonard V. Koh, Ph.D. (Emeritus)
- John G. Phillips, Ph.D.
- Harold F. Weaver, Ph.D. (Emeritus)

Associate Professors:
- Gilbert Basri, Ph.D.
- Imre de Pater, Ph.D.
- Alexei Filippenko, Ph.D.

Lecturers:
- David D. Cuttackab, Ph.D.
- Charles A. Alcock, Jr., Ph.D.
- Richard Klein, Ph.D.

Major Advisers: Mr. Bagri, Mr. Heiles.

Graduate Advisers: Mr. Davis, Ms. de Pater.

The Department of Astronomy offers undergraduate and graduate instruction in a wide variety of fields, including theoretical and observational astrophysics; infrared, X-ray, and radio astronomy; galactic and stellar structure; high-energy astrophysics and neutron stars; and sociodynamics. A considerable amount of research and teaching related to astronomy is done in other units at Berkeley, including the Space Sciences Laboratory and the Physics Department. Various courses in the Chemistry, Mathematics, Statistics, and Electrical Engineering departments have an active interest in astronomy and are available for consultation.

A variety of instruments is available to students and staff, including a 30-inch telescope at Lick Observatory (near the campus), a 120-inch telescope at Lick Observatory, an 85-foot radio telescope and three 20-foot dishes used as a mm. interferometer at Hat Creek Observatory. Laboratorv and libraries are available for use in astronomy, and the precise measurement of optical images and spectra.

The Major in Astrophysics

During the first two undergraduate years, students must, in addition to fulfilling certain specific requirements of the College of 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 technical positions in industry (particularly with aerospace companies). Specifically, the department requires that during the first two years students take courses that provide a thorough understanding of:


In addition, students are urged to take foreign language courses that will enable them to gain a reading knowledge of any one of the three languages: German, Russian, and French.

The last two years, leading to the A.B. degree in astrophysics, are spent in more intensive work, primarily in the fields of astrophysics, mechanics, and related topics. For students intending to pursue graduate studies in astronomy, a strong emphasis on physics is recommended among the elective courses (particularly in electromagnetism and quantum mechanics). The major is constructed to allow such students to obtain a double major with physics. For other students, a broader-based curriculum is possible from among an eclectic set of courses. The specific plan of study to be followed by each student is to be worked out in consultation with the department adviser for the major, and must include at least 30 units of upper division work in astronomy and allied fields. For students who are double majors in astrophysics and another science, the upper division requirement may be reduced to 24 units.

Prospecrive astrophysics students are encouraged, but not required, to take Astronomy 7 and 80 while in the lower division. Astrophysics majors are required to take Astronomy 127A-127B-127C. With the approval of the departmental adviser, outstanding students planning to do graduate work in astronomy may take a graduate course in astronomy.

Astronomy 190, an undergraduate seminar in astrophysics and astronomy, is recommended.
The remainder of the student's courses will generally be chosen from the following list: Analytic Mechanics (Physics 105), Electromagnetism and Optics (Physics 110A-110B), Modern Physics and Applications (Physics 112), Introductory Statistical and Thermal Physics (Physics 112), Introductory Nuclear Physics (Physics 124), Nuclear and Particle Physics (Physics 125), Quantum Mechanics and Its Applications to Atomic Physics (Physics 137A-137B), Introduction to Plasma Physics (Physics 142), Analysis for Applied Mathematics (Math 120A-120B), Numerical Methods for the Physical Sciences (Math 121A-121B), Numerical Analysis (Math 128A-128B), Physics of the Earth (Geophysics 122A-122B), Introduction to the Theory of Probability and Statistics (Statistics 101-102), Concepts of Probability (Statistics 134), Concepts of Statistics (Statistics 135), Foundations of Computer Graphics (Computer Science 184), Introduction to Database Systems (Computer Science 185), Principles of Meteorology (Geography 144), Climatic Change (Geography 147), Plate Tectonics (Geology 107), The Earth (Geology 151), Astronomy and Astrology in Medieval and Early Modern Europe (History 181A), Physics and Some of Its Applications (181B), Teaching Science in the Non-School Setting (Education 121A), Production of Mediated Programs (Education 122D).

Honors Program. For honors in astrophysics a student must fulfill the following requirements: (1) graduate with an average of 3.5 or better in all courses in astronomy and related fields and an overall grade-point average of at least 3.3 in the University; (2) if Astronomy 127A-127B-127C is taken, a minimum of 12 hours; (3) an individual project of research or study, involving at least three units of Astronomy H195. The student's project is chosen in consultation with the departmental adviser and the project report is judged by the adviser and one faculty member.

Graduate Programs

The graduate program is aimed at the Ph.D. degree. 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 reading of mathematics in German, Russian, and French as part of their graduate work, entering students are urged to study at least one of these languages as undergraduates.

In addition to the qualifying examination required by the University, the department requires students to pass a comprehensive 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 in preparing for the preliminary and qualifying examinations. In addition, students must pass a modest number of graduate courses taken outside the department and must acquire one year's teaching experience. A tutorial program is designed to maintain regular contact with the faculty. The program normally takes four to five years. Additional information on the program is available upon request from the Department.

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

Lower Division Courses

3. Descriptive Cosmology. (2) Two hours of lecture per week. Prerequisites: 10 or consent of instructor. Non-mathematical description of research and results in modern extragalactic astronomy and cosmology.

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

6. Breakthrough Discoveries in Modern Astronomy. (2) Two hours of lecture per week. Prerequisites: 10 or 7 or consent of instructor. Considers the major breakthrough discoveries that have, from time to time, dramatically changed the astronomer's understanding of the universe; it describes the state of astronomical knowledge when each breakthrough occurred and analyzes how the breakthrough changed that state.

7. Introduction to Modern Astronomy and Astrophysics. (4) No credit for course after taking 10. Three hours of lecture and one hour of laboratory/discussion per week. Prerequisites: Good facility in high school physics and mathematics. Description and interpretation of astronomical phenomena using the laws of modern physics. Modern astronomical instrumentation. (F,SP) Silk; Bowyer

8. The Universe Through Radio Eyes. (2) Two hours of lecture per week, plus an occasional field trip. Prerequisites: 10, 105, 7, or 75, or consent of instructor. Topics vary and may include modern instrumentation, the three degree cosmic microwave background, radio galaxies and quasars, pulsars, interstellar atoms and molecules, interstellar masers, and radio studies of the solar system, with physical understanding with occasional use of mathematics.

9. Selected Topics in Astronomy. (2-3) May be repeated for credit, taking different sections (A, B, C, etc.). Two or three hours per week, depending on topic. Prerequisites: 10, 105, 7, or 75, or consent of instructor. Relativistic astrophysics in an area of current research interest. Topics explored in greater depth than in introductory courses. Classes taught by graduate students. Discussion and class participation encouraged. (F,SP)


9B. Relativity and Cosmology. (2,3) Evolution and origin of the Universe. Quasars. Curved spacetime, gravitational observations. (F,SP) Schlegel; Fieher

9C. Stellar Systems. (2,3) Star clusters, galaxies, and clusters of galaxies. Formation dynamics and evolution.

9D. Solar System. (2,3) Sun, planets, spacecraft exploration. Formation and evolution of the solar system.

9E. Interstellar Medium. (2,3) Gas and dust between the stars, regions of star formation, structure of the galaxy, cosmology.

9F. Observational Astronomy. (2,3) Telescopes, instruments, astronomical photography, and observing techniques.


9H. High Energy Astrophysics. (2,3) Study of a selection of unusual astronomical objects, such as Gamma ray, x-ray, and ultraviolet sources, from an observational viewpoint.

9I. History of Astronomy. (2,3) Astronomical concepts which influenced development of subfields of astronomy; determination of distance on all scales in the Universe; instrumentation, planetary astronomy, novae and supernovae, and galaxy evolution.

10. Introduction to General Astronomy. (4) Students who have completed Astronomy 7 will receive no credit for Astronomy 10. Three hours lecture and one hour 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 extragalactic communication, etc. Individual instructor's synopses available from the department. (F,SP) Filippenko, Shu, (F); Basri, TBA (SP)

38. Seminar. (2) Two 1-hour seminars per week. A small-size undergraduate seminar exploring an astronomical topic in depth with students being respons-

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*101. Current Problems in Astronomy. (3) Students who have completed 127A-B-C may not receive credit for 101. Three 1-hour lectures per week. Prerequisites: Physics 7 series, Math 50A-50B. Introduction to the principal fields of modern astrophysical research. It is intended primarily for majors in the physical sciences and engineering.

127A. Astrophysics of Stars and Stellar Systems. (3) Three hours lecture per week; occasional laboratory or observing time. Prerequisites: Physics 7 series, Mathematics 51A-51B-51C. Introduction to modern astronomy and physical discussion of stars—the observations, theory of stellar evolution. Stellar systems—clusters, the galaxy, external galaxies, and galaxies. Cosmological observations and interpretation. (F) King

127B. Stellar Structure and Evolution. (3) Three hours lecture per week; occasional laboratories or observing time. Prerequisites: 127A. The transfer of radiation from stellar atmosphere analysis, planetary atmospheres; stellar structure and evolution. (SP) Backer

127C. Interstellar Matter and High Energy Astrophysics. (3) Three hours lecture per week; occasional laboratories or observing time. Prerequisites: 127A; 127B recommended. Interstellar matter, high energy astrophysics, condensed objects. (F) Alcock

149. Solar System Astrophysics. (3) Three hours lecture per week. Prerequisites: Physics 7ABC, Math 50AB. The study of solar system astronomy: planetary formation, interior structure, atmospheres, surface structures, planetary ring systems, comets, asteroids, satellites, magnetospheres.

190. Undergraduate Seminar. (2) May be repeated for credit. Two 1-hour seminars per week. Prerequi-

sites: Upper division standing. Seminar format discussion of selection of current problems in astronomy. This course meets for two hours per week in an informal setting where group discussions or student presentations will take place on astronomical issues of current interest. The focus will be not only on the formal subject matter, but also on the nature of scientific inquiry. Students experience how to recognize scientific problems and resolve them. (SP)

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

199. Supervised Independent Study and Research. (2-4) Course may be repeated for credit. Independent study. Student must be on a pass/fail basis. Must be taken on a pass/fail basis. (2-4 eyes) Prerequisites: 127A-127B. Enrollment is restricted by regulations in the General Catalog. (F,SP)

Graduate Courses

201. Radiation Processes in Astronomy. (4) Three hours lecture and one hour discussion per week. Prerequisites: Physics 105, 110A, 110B concurrently; open to advanced undergraduate graduates with GPA of 3.70. Formerly 201A. An in-
transfer by radiation. Elements of classical and quantum theory of photon emission; bremsstrahlung, cy- sions. Collisional excitation of atoms, molecules and nuclei. (F) Kahn


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) Heiles

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

218. Stellar Dynamics and Galactic Structure. (3) Three hours of lecture per week. A basic course. Structure and kinematics of the galaxy; stellar population concepts; dynamics of stellar systems with and without encounters. (SP) King

228. Extragalactic Astronomy and Cosmology. (3) Three hours of lecture per week. Formerly 228 and 229. A survey of the field 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) Spivak

236. Radio Astronomy. (3) Three hours of lecture per week. Prerequisites: 216 recommended. Comparison of radio and optical instrumentation and techniques. Detailed application of radiation and physics to objects observed in the radio range, including emission nebulae, galactic pulsars, with application to current observations. (F) Welch

238. Special Topics in Astronomy. (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.

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. The study of planetary atmospheres and surfaces. Meteors, comets, and the inter planetary medium. Observational techniques and problems. (F) De Pater

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

255. Computational Methods in Theoretical Astrophysics. (3) Two 1½ hour lectures per week. Prerequisites: 127 series or consent of instructor. The formulation and numerical solution on large-scale computers of problems involving coupled non-linear astrophysical flows with radiation transport; fundamental concepts underlying finite-difference approaches for Lagrangian and Eulierian dynamics; applications in normal and x-ray irradiated stellar atmospheres, pulsating variables and stellar mass loss, supernova explosions, x-ray pulsars, sequential star formation and 2-D evolution of H II regions. (F) Klein

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 1 section; three units for two discussion sections. (F,SP)

301. Undergraduate Astronomy Instruction. (1-2) May be repeated for credit up to a maximum of 4 units. One hour of lecture and 3-4 hours laboratory per week. Must be taken on a pass/fail basis. Prerequisites: An elementary astronomy course and consent of instructor. Open to a limited number of highly qualified undergraduate students interested in astrophony 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.

Interdepartmental Studies Courses

Graduate Courses

*IDS 252. Stellar Structure and Evolution. (3) Three hours of lecture per week. Prerequisites: Physics 107A-107B, 112, 1104A-1108B. Equations of stellar structure, radiative transfer and convection, thermonuclear reactions and stellar energy generation; stellar models; degenerate configurations; evolution sequences; supernovae; neutron stars; black holes and crusts. (F,SP) Sponsoring departments: Physics and Astronomy.

*IDS 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 astrophysical environments; Cosmic ray production and propagation. Applications selected from pulsars, x-ray sources, supernovae, interstellar medium, intergalactic medium, extragalactic radio sources, quasars, and big-bang cosmologies. (F,SP) Sponsoring department: Physics and Astronomy.

*IDS 285. Theoretical Astrophysics Seminar. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. The study of theoretical astrophysics. Sponsoring departments: Astronomy and Physics.

Berkeley Programs for Study Abroad (Special Studies)

Office: 2538 Channing Way, Building D, Room 104, 642-1396
Berkeley Programs for Study Abroad (BPSA) offers the Education Abroad Program for undergraduates and graduate students. For additional information, contact: BPSA, 2538 Channing Way, Berkeley, CA 94720-3114 (642-1396), or visit our website at http://www.bpsa.berkeley.edu

BPSA also sponsors the Professional Studies Program in India. The program is open to American graduate students in professional fields at any accredited U.S. institution. Students spend two semesters in India. Based on their professional and research interests, participants design projects that are conducted under the supervision of Indian faculty and professionals. Seminars are offered by the program's academic staff on Indian culture and tradition. For information on issues related to study and travel, contact: Office; 2538 Channing Way, Building D, Room 104, Berkeley, CA 94720-3114.

All courses listed below are offered in India only.

Upper Division Courses

*100. Cultural Traditions of India. (1-4) Three hours lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate status and acceptance into program. This course provides background on Indian culture and civilization which is critical in understanding professional problems within the whole context of India. The course will involve lectures and field trips intended to orient students to India.
Graduate Courses

"200. Cultural Traditions of India. (1-4) Independent study. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate status and acceptance into program. If students have a background in Indian studies, they may elect to take the Cultural Traditions course on a 200 basis, in which they must write a paper on a topic of their choosing, in consultation with the instructor.

"299. Independent Study. (1-5) Independent study. Prerequisites: Graduate status and acceptance into program. Independent study through various academic departments.

Professional Courses

"400. Modernization in Contemporary India. (1-4) Three hours lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate status and acceptance into program. This course will deal with problems of development and social change, the economics of modernization and the impact of industrialization. The course will also direct itself to the professional interests of program participants. Interdisciplinary emphasis.

497A. Internship in India. (4-5) Field work and research done by student. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate status and acceptance into program. This course comprises the field work and research aspect of the Professional Studies Program. (F,SP)

Biochemistry

(College of Letters and Science)

The biological sciences at Berkeley were reorganized in July 1989. Consult staff in the Department of Molecular and Cell Biology for information on graduate and undergraduate programs in biochemistry. Undergraduate students who declared the biochemistry major before fall 1989 may continue in the program provided they complete all degree requirements and graduate before fall semester 1993. Such students should contact Mary Sylvia, Department of Molecular and Cell Biology, 121 Genetics and Plant Biology Building, 643-7473.

Bioengineering

Graduate Training at Berkeley and UC San Francisco (Special Studies)

The University of California at Berkeley and San Francisco campuses offer a joint graduate program in 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 resources available on the Berkeley campus.

The program is interdepartmental as well as intercampus. It combines related interests and research activities of faculty from five of the seven engineering departments and from several nonengineering departments at Berkeley with those of the faculty from all four professional schools (Dentistry, Medicine, Nursing, and Pharmacy) at San Francisco.

All students in the program are simultaneously enrolled in the Graduate Divisions of both the San Francisco and Berkeley campuses and are free to take advantage of courses and research opportunities on both campuses.

The program awards Master of Science in Bioengineering and Doctor of Philosophy in Bioengineering degrees that carry the names of both campuses.

Students with a B.A. or B.S. degree in engineering, biology, or other sciences are eligible for admission. Students can obtain additional information and application material by contacting the Bioengineering Graduate Group, College of Engineering, Meakins Interdisciplinary Studies Center, University of California at Berkeley; Berkeley, CA 94720; (415) 642-8790.

Upper Division Courses

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Supervised independent study. (F,SP) Staff

Graduate Courses

299. Individual Study or Research. (1-12) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Independent, advanced problems in bioengineering. (F,SP) Staff

Biology

(College of Letters and Science)

The biological sciences at Berkeley were reorganized in fall 1989. The teaching functions of the Department of Instruction in Biology are now administered by the Department of Integrative Biology, the Department of Molecular and Cell Biology, and the Department of Plant Biology. Students in the latter two departments who wish to major in biochemistry should consult staff in these three departments. Undergraduate students who declared one of the biology field majors before fall 1989 may continue in the program if they provide all degree requirements and graduate before fall semester 1993.

Note: Because the three courses below provide a broad, basic introduction to the biological sciences for both majors and nonmajors, and because they are taught by faculty from all three of the biology departments, the name "Biology" has been retained to reflect their interdepartmental character.

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. Neither is a prerequisite for the other.

Lower Division Courses

1A. General Biology. (4) Three 1-hour lectures, one 3-hour laboratory, and one hour discussion per week. Prerequisites: Chemistry IA-IB, Chemistry 1A with a grade of B or better and current enrollment in Chemistry IB; Chemistry 8A recommended concurrently. General introduction to cell structure and function, molecular and organismal genetics, animal development, form and function 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. Suggested by Molecular and Cell Biology.

1B. General Biology. (4) Three 1-hour lectures, one 3-hour laboratory, and one hour discussion per week. Prerequisites: Chemistry IA-IB. General introduction to plant development, form and function; population genetics, ecology and evolution. Intended for students majoring in the biological sciences, but open to all qualified students. Students must take both Biology 1A and 1B to complete sequence. Suggested by Integrative Biology. (F,SP) Liddle, Thomson, Schmid (F); Clemens, Friedman (SP).

11. Introduction to the Science of Living Organisms. (4) Students may not receive credit for this course if they have credit for both Integrative Biology 15 and 30. Three hours of lecture and one 5-hour laboratory per week. Prerequisites: For student not majoring in Biological Science and for non-science majors. Principles of biological organization and function using examples from plant and animal kingdoms. Simplicity of Marine science is neither required nor assumed. Sponsored by Plant Biology. (F)

Biomedical and Environmental Health Sciences

(School of Public Health)

Department Office: 113 Haviland Hall, 642-4416
Chair: George F. Sembesmeyer, D.Crim.
Professors:
Nina M. Agabian, Ph.D. Albert Einstein College of Medicine. Pathogenesis and antibiotic variation of medically important parasites; DNA technology
Richard J. Brand, Ph.D. University of California at Berkeley. Biostatistical methods for risk research and clinical trials
Robert C. Spear, Ph.D. University of California at Berkeley. Genetics and epidemiology of breast cancer
Joyce C. Lashof, M.D. Washington University. Community-oriented primary care
Nehemiah L. Frankel, M.D. University of Washington, St. Louis. Cancer epidemiology
Stanley B. Prusiner, M.D. Arthur L. Reingold, M.D. University of Chicago. Epidemiology of infectious diseases
Steve Selvin, Ph.D. Application of data analysis techniques to environmental and epidemiological problems
George F. Sembesmeyer, D.Crim. University of California at Berkeley. Forensic biology; human biochemical genetics
Allan H. Smith, M.D. (New Zealand). Occupational and environmental epidemiology
Robert C. Spear, Ph.D. Cambridge University. Engineering aspects of environmental and occupational health
S. Leonard Syme, Ph.D. Yale University. Social and cultural influences on the occurrence of disease
Michael E. Tarter, Ph.D. University of California at Los Angeles. Computer-intensive model-free statistics
Constantine H. Timpellis, Ph.D. University of Wisconsin. Immunoregulation
John T. Thorton, D.Crim. University of California at Berkeley. Forensic science; physical evidence analysis and interpretation
Nayanl V. Vedros, Ph.D. University of Colorado. Comparative immunology, immunology of marine mammals
Edward T. Wei, Ph.D. University of California at San Francisco. Peptide pharmacology and immunology
Warren Winkelstein, Jr., M.D., M.P.H. Columbia University. Epidemiology; cancer/ AIDS
Chin Long Chiang, Ph.D. (Emeritus)
Santo D. Eiber, Ph.D. (Emeritus)
Neil F. Hollinger, Ph.D. (Emeritus)
Stewart H. Madin, D.V.M., Ph.D. (Emeritus)
William J. Oswald, Ph.D. (Emeritus)
William C. Reeves, Ph.D., M.P.H. (Emeritus)
Living R. Taberhawa, M.D. (Emeritus)

Associate Professors:
Gurudee C. Buehrpf, Ph.D. University of California at Berkeley. Epidemiology and breast cancer
Brenda Ereskenazi, Ph.D. G.Y. Human behavioral toxicology/physiological psychiatry; neuroendocrinology; perinatal epidemiology
William A. Satinari, Ph.D. Purdue University. Epidemiology of aging
Marty T. Smith, Ph.D. St. Bartholomew's Hospital Medical College, London. Occupational and environmental toxicology

Assistant Professors:
Charles P. Koehler, Ph.D. Stanford University. Engineering aspects of environmental health; combustion
Hira M. Maitra, Ph.D. Columbia University. Survival analysis, bioassays
William J. Redfeam, Ph.D. University College, London. Rounding genetic markers, cumulants, factor-analysis models

Professors:
Walter W. Hauck, Ph.D. (Adjunct)
John E. Swartzberg, M.D. (Clinical)
Ralph Thomas, Ph.D. (Adjunct)

Associate Professor:
W. Thomas Boyce, M.D. (Adjunct)
The Department of Biomedical and Environmental Health Sciences has a dual mission: (a) to provide graduate students with the specific foundation of disease prevention in human populations, and (b) to expand this foundation through research. The faculty of the department brings a multidisciplinary perspective to this mission, and both the teaching and research programs are designed to facilitate interdisciplinary communication and cooperation. Important public health objectives served by the department include identification of the biological, chemical, physical, and social factors that affect human health; development of analytic methods and investigative models to measure and assess the impact of these factors on health; and design and evaluation of health programs. Some areas of special interest include the study of arthropod-borne viral diseases, air and water pollution in the etiology of cancer and other diseases, host-parasite relationships in infectious diseases, the toxicology of chemicals in the environment, the human health aspects of the work place, and forensic science.

Disciplines represented by faculty in the department include biostatistics, chemistry, engineering, entomology, forensic science, genetics, immunology, medicine, microbiology, psychology, sociol- ogy, and toxicology. The faculty are organized into four curricular programs: biomedical sciences, bio- statistics, environmental health sciences, and epidemiology. Because problem areas in public health require interdisciplinary approaches, students are encouraged to take advantage of the disciplinary diversity within the department, in the school, and on the campus in designing their programs of study.

The department offers both professional and academic degree programs. The professional degree programs lead to the M.P.H. and Dr.P.H. degrees and are administered by the School of Public Health. Academic degree programs leading to the M.A. or M.S. and Ph.D. degrees are offered in biostatistics, environmental health sciences, epidemiology, immunology, microbiology, and parasitology. These M.A. and M.S. and Ph.D. degree programs are administered by the Graduate Division. Students seeking detailed information about any of these programs regarding admission, curriculum, and financial support should direct inquiries either to the department or to the program of interest within the department.

The following sections have been established for courses 197, 198, 199, 295, 296, 297, 298, 601, and 602. The courses may be repeated for credit, but some sections may not be given every semester.

K. Environmental Health Sciences

L. Biostatistics

N. Epidemiology

P. Biomedical Sciences

Q. Epidemiology/Biostatistics M.P.H. Program

S. Forensic Science

Upper Division Courses

103. Public Health Microbiology, (1-4) Two 1/2-hour lectures and one 2-hour demonstration/discussion/laboratory per week. Prerequisites: Basic Biology and Chemistry. Lectures and demonstrations may be taken altogether or each alone. Satisfies most requirements for a laboratory course in microbiology. Introduction to properties of microorganisms; their relationships with humans in causing infectious diseases, and in maintain- ing health of population and sanitation. (F) Cooper, Grant, Tempelis, Vedros

104. Introduction to Medical Virology, (3) Three 1-hour lectures per week. Prerequisites: Elementary courses in biology and chemistry, including biochemistry, or consent of instructor. Basic principles of molecular biology, pathology, immunity, epidemiology, and control of medically important viruses. (F) Hardy

121. Introduction to Vital and Demographic Statistics, (4) Three 1-hour lectures and one 1-hour discussion section per week. Statistical and evaluation methods in studies of human mortality, morbidity, and natality. History of vital statistics, critical appraisal of census and vital data, measurement of risk, and introduction to life tables. Health record systems, analysis of mass data. (F) Tarter

122. Introduction to Health Statistics, (3) Two hours of lecture, one hour of discussion and two hours of laboratory per week. Prerequisites: High school algebra. Basic tools of descriptive and inferential statistics, life tables, rates and rate adjustment. Regression and correlation, statistical aspects of basic experimental and observational health research designs. (F) Langhauser

130A. Introduction to Probability and Statistics in Biology and Public Health, (4) Three 1-hour lectures and one 2-hour discussion section per week. Prereq- uisites: High school algebra. Descriptive statistics, probability, probability distribution, point and interval estimation, hypothesis testing, chi-square, correlation and regression with biomedical applications. (F) Langhauser

130B. Introduction to Probability and Statistics in Biology and Public Health, (4) Three 1-hour lectures and one 2-hour discussion section per week. Prereq- uisites: 130A or equivalent. Regression, analysis of variance; bioassay, analysis of covariance, design of experiments, and nonparametric analysis with biomedical applications. (SP) Langhauser

138. Introduction to Health Survey Methods, (4) Three hours of work per unit per week. Must be taken on a passed/not passed basis. Prerequisites: Enrollment is restricted by regulations listed in the General Catalog. (F,SP)

149. Chemical Hazards in the Environment, (3) Two 1/2-hour lectures per week. Prerequisites: Biology 1A-1B, or Chem 8A-8B or permission of instructor. Introduction to the scientific and technical basis of the evaluation of risk to human populations from expos- sure to chemicals in the community and in the work environment. (SP) Koshland, Matlith

150. Environmental Health in the Community, (2) Two hours lecture per week. Prerequisites: Chemistry 1A; Mathematics 1A. Fundamentals of water quality, waste treatment, air quality, and food hygiene related to health.

153. Introduction to Pharmacology, (3) Two 1 1/2 hours lectures per week. Prerequisites: Organic Chemistry; upper division biological science. Principles of drug action and toxicity. Brief survey of major groups of chemicals used in therapy. (SP) Wei

160. Microbiology of Water and Wastewater, (3) Two 1-hour lectures and one 3-hour laboratory demonstration per week. Prerequisites: Elementary courses in biology and chemistry. Formerly 156 and 156L. Princip- ies of microbiology applicable to the aquatic envi- ronment, drinking water and wastewater. (SP) Cooper

160. Introduction to Epidemiology and Environmental Health, (1-3) Three hours of lecture and one 11/2-hour discussion section per week. Prerequisites: Prior background in biological sciences and a course in biostatistics required or consent of instructor. Introduction to principles and uses of epi- demiology and environmental health. The course is divided into 2 modules. The first covers the principles and methods of epidemiology and reviews the epi- demiology of important specific diseases, and the second presents special issues concerning the physical environment. Variable unit course: 3 units for 2 mod- ules: 2 units for epidemiology module, 1 unit for environ- mental modules. Regular exit exams offered for both modules. (SP) Reingold, Staff

181. Trace Microanalysis, (4) Two 1-hour lectures and two 3-hour laboratories per week. Prerequisites: Upper division standing in a physical or natural science. A systematic approach to the microanalysis of materials using chemical and physical techniques. Emphasis on materials of forensic and environmental pollution significance. (SP) Thornton

183. Forensic Toxicology, (2) Two 1-hour lectures per week. Prerequisites: Upper division standing in a physical or natural science. Laboratory in the detection and estimation of toxic substances in the human organism by chem- ical and physical means. Systematic analysis of normal and abnormal constituents to determine presence or absence in relation to legal standards of proof. (F) Shuglin

183L. Forensic Toxicology Laboratory, (2) One 1- hour lecture/demonstration and one 3-hour laboratory per week. Prerequisites: Upper division standing in a physical or natural science. Laboratory in the detection and estimation of toxic substances in the human organism by chemical and physical means. (F) Shuglin

197. Field Study in Public Health, (1-4) Course may be repeated for credit. Requires three hours of work per unit per week. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Enrollment is restricted by regulations listed in the General Catalog. (F,SP)

198. Directed Group Study, (1-4) Course may be re- peated for credit. Requires three hours of work per unit per week. Must be taken on a passed/not passed basis. Prerequisites: Enrollment is restricted by regulations listed in the General Catalog. (F,SP)

199. Supervised Independent Study and Research, (1-4) Course may be repeated for credit. Requires three hours of work per unit per week. Must be taken on a passed/not passed basis. Prerequisites: Enrollment is restricted by regulations listed in the General Catalog. (F,SP)

Graduate Courses

201A. Principles of Infectious Disease, (5) Three 2- hour sessions per week to include lectures, discussion and demonstration laboratories. Prerequisites: Basic courses in biology, biochemistry, molecular biology or consent of instructor. A critical analysis of the various types of interactions that occur at the molecular, organ- ismal, and community levels between infectious disease agents, humans and their environments that re- sult in infection, disease and immunity in humans and human populations. (F) Hardy

201B. Infectious Disease: Host-Parasite Interac- tions, (4) Two 2-hour lectures/discussions per week.
Prerequisites: 201A or consent of instructor. A critical analysis of the host-parasite interactions that occur after exposure and infection of humans with various infectious disease agents, including representative nematodes, cestodes, and protozoa. Prerequisites: Concurrent enrollment in 201A-201B or consent of instructor. Formerly 104L & 105. Designed to present contemporary methods for the determination of the pathogenicity of infectious agents. 201L will emphasize techniques in cell culture, diagnostic immunology, mycology, and parasitology. The second semester, 201M, will cover current methods for isolation, characterization, and identification of pathogenic bacteria and viruses of their virulence components. Students with specialized needs may take portions of the course on a modular basis. (F) Grant, Moos-Holling

201L Infectious Disease Laboratory. (1-3) Two 3-hour laboratories and one 2-hour discussion per week. Prerequisites: Concurrent enrollment in 201A-201B or consent of instructor. Formerly 104L & 105. Designed to present contemporary methods for the determination of the pathogenicity of infectious agents. 201L will emphasize techniques in cell culture, diagnostic immunology, mycology, and parasitology. The second semester, 201M, will cover current methods for isolation, characterization, and identification of pathogenic bacteria and viruses of their virulence components. Students with specialized needs may take portions of the course on a modular basis. (SP) Grant, Moos-Holling

204. Advanced Medical Virology. (3-4) Two 2-hour lecture/discussion sections per week. Prerequisites: 104L or consent of instructor. Analysis of viruses and host factors that play a role in viral diseases of medical importance. Four units of credit given to doctoral students who write a research proposal on a topic other than that proposed for their dissertation. (SP) Hardy, Volkman

205. Advanced Medical Microbiology. (3) Course may be repeated for credit. Two 2-hour lecture/discussion sections per week. Prerequisites: 201A or consent of instructor. Analysis of bacterial and fungal cell components and host factors that play a role in molecular disease. (SP) Grant, Moos-Holling

206. Public Health Epidemiology. (2) Two 1-hour lectures per week. Prerequisites: 105 or equivalent. Current immunological developments in relation to hypersensitivity, tolerance, immunologic disorders, autoimmune diseases, transplantation and infectious diseases. (F) Tempels

207. Advanced Methods in Medical Microbiology. (4) One 1½-hour lecture with one 3-hour laboratory and one 4 ½-hour laboratory per week. Prerequisites: A course involving sterile techniques and consent of instructor. Theory and practice of current analytical methods used in clinical and research medical microbiology: tissue culture, karyotyping, immunological probes, electrophoresis, chromatography, radioisotopes, analytical ultracentrifugation. (F)

210A. Current Problems in the Public Health Laboratory. (1.5) One 1 ½-hour lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Biomedical Sciences. Existents for health and public health laboratories; current diagnostic and surveillance data and environmental problems associated with microorganisms; hospital infection control. (SP) Tempels

210B. Current Issues in the Public Health Laboratory. (1) One 1-hour discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Biomedical Sciences. Existents for health and public health laboratories; current diagnostic and surveillance data and environmental problems associated with microorganisms; hospital infection control. (SP) Tempels

220A. Biostatistical Methods. (4) Three hours of lecture and one 2-hour laboratory per week. Prerequisites: A course in mathematical statistics or 2 years of calculus plus linear algebra and a mathematical statistics course taken concurrently. Two distinct topics will be presented: Biostatistical Computing and Risk Research Methods. Computing techniques, numerical methods, simulation, and general implementation of biostatistical techniques. Modelling of risk processes including design, sample size planning, bias control and multifactor prediction and analysis. Material presented will be illustrated in the laboratory. (F) Selvin, Jewell

220B. Biostatistical Methods. (4) Three hours of lecture and one 2-hour laboratory per week. Prerequisites: 220A. Two distinct topics will be presented: Survival Analysis and Clinical Trials. Analysis of survival time data using parametric and non-parametric models, hypothesis testing, and regression methods for censored data with covariates. Biostatistical concepts and modelling relevant to design, conduct and analysis of clinical trials. Material presented will be illustrated in the laboratory. (SP) Malani, Brand

222. Biometrical Data Analysis—Pathological and Incomplete Data. (2) Three hours of lecture and one 2-hour discussion per week. Prerequisites: 130A-130B or equivalent, or consent of instructor. Survey of classical methods: mixture, clustered, grouped, incomplete, Cox-model, and truncated data simulation and analysis. (SP) Tarter

223. Introducton to Risk and Intervention Research Methods. (4) Three hours of lecture and one 2-hour discussion/laboratory section per week. Prerequisites: 130A-130B or equivalent, or consent of instructor. Survey of classical methods: mixture, clustered, grouped, incomplete, Cox-model, and truncated data simulation and analysis. (SP) Tarter

225. Biometrical Data Analysis—Model Free Curve Estimation. (4) Three 1-hour lectures and one 2-hour discussion section per week. Prerequisites: 130A-130B or equivalent, or consent of instructor. Generalized linear models, survival models, regression models for clustered data, longitudinal data, time series, categorical data, mixed models. (SP) Tarter

226A-226B. Special Topics in Biostatistics. (1-3) Course may be repeated for credit. One to three hours of lecture/discussion per week. Prerequisites: 220A, 220B or consent of instructor. Current issues in biostatistical research. Topics will vary from term to term depending on student demand and faculty availability. Possible topics are bioassay, meta-analysis, compartmental models, biostatistical consulting, covariance structure models, bootstrap and jackknife methods, artificial intelligence techniques in biostatistics. (SP) Staff

230. Stochastic Processes in Biology and Health. (3) Three 1-hour lectures per week. Prerequisites: Consent of instructor. Formerly 230A-230B. Introduction to a wide variety of models and methods, illustrated with biological and biomedical examples. Generating functions, binomial process, Poisson process, random walk, brownian motion, renewal processes, inventory chains, birth- and death processes, epidemic models, diffusion processes, discrete-time martingales. Mathematical results are precisely stated, interpreted and explained, but formalities of proof are omitted. (SP) Redfearn

231. Introduction to Multivariate Statistics. (4) Three 2-hour lectures and one 2-hour laboratory session per week. Prerequisites: 130A or equivalent or consent of instructor. A selection of the following topics is discussed in the context of biomedical and biotechnological application: multiple linear model, loglinear models, discriminant analysis, principal components, factor analysis. Instruction in statistical computing is given in the lab session. (SP) Redfearn

234. Statistical Methods in Survival Analysis. (3) Three 1-hour lectures per week. Prerequisites: Calculus, matrix algebra, one year of mathematical statistics: Analysis of survival time data. Parametric and nonparametric models for hypothesis testing and estimation. Regression models and data with covariates. Cox proportional hazards model. Accelerated time models; mixture and semi-Markov models. (SP) Jewell

240. Evaluation and Control of Airborne Chemicals. (3) Two 1 ½-hour lectures per week. Prerequisites: Consent of instructor. Survey of methods for measuring of airborne chemicals. Instrumentation, procedures and sampling equipment, and industrial applications. Intended primarily for students specializing in industrial hygiene. (F) Koshash

241. Industrial Hygiene: Physical Agents. (3) Three 1-hour lectures per week. Prerequisites: Consent of instructor. Survey of methods for measuring of airborne chemicals. Instrumentation, procedures and sampling equipment, and industrial applications. Intended primarily for students specializing in industrial hygiene. (F) Koshash

242. Characterization of Airborne Chemicals. (3) Three 1-hour lectures per week. Prerequisites: Consent of instructor. Survey of methods for measuring of airborne chemicals. Instrumentation, procedures and sampling equipment, and industrial applications. Intended primarily for students specializing in industrial hygiene. (F) Koshash

243. Industrial-Hygiene Laboratory. (2) One 3-hour laboratory and one 2-hour discussion per week. Prerequisites: 240, 241, 242. (Can be taken concurrently with 241), Practical experiments designed to illustrate...
principles of industrial hygiene. Topics include air monitoring methods, ventilation measurements, noise measurements, nonionizing radiation measurements. (SP) Hines

244. Industrial Hygiene: Professional Practices. (3) Six hours lecture/laboratory or discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 240, and 241 or 242. Familiarize students with the professional skills practiced by industrial hygienists in management, labor and government programs. Introduce students to the occupational environment in selected industries. (SP) Plog

245. Indoor Air Pollution. (3) Three one-hour lectures per week. Prerequisites: Graduate Standing or Consent of Instructor. Introduce the major pollutant classes of concern, describes pollutant behavior, exploration methods, ventilation measurements, noise measurement.

246. Principles of Occupational Diseases. (2) Two hours of lecture per week. An overview of the major occupational diseases including pulmonary, dermatologic, musculoskeletal, neuropsychiatric. Specific disease causing agents (solvents, metals, pesticides and others) will be discussed. The course will cover causality and prevention. The class does not require previous medical or biological background. (F) Seward

247. Chemical Risk Assessment. (3) One two-hour lecture and one discussion hour per week offered as a three hour block. Prerequisites: Previous or concurrent enrollment in 239, 260, 262 or 290, 240. Cover the objectives, principles and methods for health risk assessment of occupational and environmental exposure to chemicals. Participants will conduct and report component of a health risk assessment for one chemical using animal and human data, and extrapolating risks to a low exposure scenario. (F) A. Smith, M. Smith

253. Environmental Toxicology. (3) Three hours or lecture per week. Prerequisites: Graduate standing or consent of instructor. Principles of toxicology applied to the evaluation and control of chemical hazards in air, food, and water. Biological mechanisms of toxicity will also be discussed. (F) M. Smith

254. Advanced Toxicology. (2) May be repeated for credit. Three hours seminar per week. Prerequisites: 253. Current topics in toxicology research. Seminar format. (SP) Wei

255. Chemical Carcinogenesis and Teratogenesis. (3) Three hours lecture per week. Prerequisites: 253 or consent of instructor. Overview of the mechanisms by which chemicals are thought to cause cancer and birth defects. Approximately 4 weeks (8 lectures) will be devoted to human exposure and environmental analysis. Class to date review of the latest theories will be given in light of the latest findings in biochemistry, cell biology and molecular biology. The importance of these findings for estimating human health risk will also be discussed. (SP) M. Smith

256. Environmental Health and Infectious Disease. (2) Two hours lecture/discussion per week. Prerequisites: 253 or consent of instructor. A survey of important infectious diseases associated with disease etiology, and vectors. Their description, distribution, and control. (F) Cooper

258. Toxicology Laboratory. (3) One 1-hour lecture followed by seven laboratory hours per week. Prerequisites: Graduate standing and 253 or consent of instructor. Experimental methods and techniques for evaluating the adverse effects of chemicals on living systems. (SP) M. Smith

259. Applied Allogogy. (3) Three hours lecture per week. Prerequisites: Graduate or upper division standing in Engineering, Biology, or Public Health. Applications of microbiological systems to human needs. (F,SP)

260. Epidemiologic Methods. (4) Three 1-hour lecture and one 3-hour laboratory per week. Prerequisites: 160 or equivalent one semester course in epidemiology: BEHS 130A or concurrent enrollment or consent of instructor. Principles and methods of epidemiology: study design, selection, and definition of cases and controls; sampling, data collection, analysis, and inference. Students will develop an opportunity to apply methods to problems and see discussion issues presented in lecture. (F) Winkelftein

261. Current Problems in Epidemiology. (3) May be repeated for credit. One 3-hour lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Introductory course in epidemiology and basic statistics. Guest lecturers and staff present their current research in epidemiology and related fields, emphasizing the bases for development of research programs, methods employed, and difficulties encountered. (SP) Syme

262. Advanced Epidemiology. (3) May be repeated for credit. Two 1½-hour lectures per week. Prerequisites: 280 and 130A or consent of instructor. Formerly 272, 275, 276, and 279. Theory and application of epidemiology to common diseases of complex etiology. Multivariable analysis of associations from several subject modules which are selected annually from current, critical reviews. Pre-enrollment required. (SP) Staff

263. Epidemiology and Control of Infectious Diseases. (3) One 3-hour lecture/discussion per week. Prerequisites: Prior course or courses in biomedical sciences and consent of instructor. Emphasis will be given for major infectious diseases with emphasis on disease surveillance, investigative procedures and prevention programs. Emphasis is on current problems in health agencies at a state, national and international level. (SP) Reingold

264. Occupational Epidemiology. (2) Two hours of lecture per week. Prerequisites: Consent of instructor. Principles and methods of epidemiology for the design, execution and analysis of occupational health studies, and for occupational health monitoring and surveillance programs. The course is designed for students with primary interest in occupational and environmental health. (F) A. Smith

265. Design and Conduct of Clinical Trials. (2) One 2-hour lecture/discussion. Prerequisites: 130A, 260, or consent of instructor. Emphasis on epidemiologic and biostatistical principles underlying clinical trials. Organization, design, allocation schemes, sample size, power estimates, operational issues, data management and analysis will be addressed. Trials addressing public health issues will be featured. Case study approach to published trials. (SP) Reingold

266. Practicum in Epidemiologic Methods I. (3) One 2-hour lecture and one 2-hour computer laboratory per week. Prerequisites: 260; 130B or 223 concurrently; consent of instructor. First in a two-semester sequence intended for students in the Epidemiology/Biostatistics MPH program and other qualified graduate students. Course teaches use of CMS and SAS in performing univariate analyses; students also learn to critically review scientific literature. (SP) Eskenazi, Sholtz

267. Topics In Disease Surveillance. (2) One 2-hour session per week. The course will focus on various ways of doing surveillance for infectious and non-infectious diseases; how the reasons for doing surveillance influence the selection of the system selected; and how to evaluate whether or not a given surveillance is providing the data needed to meet various goals. The course will also explore the impact of various biases on the conclusions derived from surveillance data. (F) Reingold

268. Genetic Epidemiology. (2) One 2-hour lecture per week. Prerequisites: Upper-division or graduate courses in epidemiology, genetics or human genetics, and statistics or biostatistics; or consent of instructor. Epidemiologic, genetic and statistical approaches for the analysis of genetic influences on diseases in human populations and families. Interaction of genetic, environmental, and cultural risk factors for disease. (F,SP) Kirlg

269. Advanced Occupational and Environmental Epidemiology. (3) One 3-hour session per week. Prerequisites: 260 or 264. This course provides an 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 the course 264, but 260 is sufficient as a prerequisite. (SP) A. Smith

270. Epidemiological Analysis. (3) Three hours of lecture per week. Prerequisites: 222, 231, 260, or consent of instructor. Advanced treatment of epidemiological techniques: discussion of blast of cohort data, data from multiple cohort data, spatial cluster data and contingency tables; logistic regression; analysis of time dependent data including life tables, Kaplan-Meier estimation and proportional hazards models. (SP) Shurtleff

271. Outbreak Investigation. (2) One 1-hour lecture per week and fieldwork outside class time. Prerequisites: Instructor approval required. The course will teach students why and how clusters of illnesses/epidemics are investigated. In the weekly seminar, methods and approaches required for investigating an outbreak of cohort data, spatial cluster data and contingency tables; logistic regression; analysis of time dependent data including life tables, Kaplan-Meier estimation and proportional hazards models. (SP) Shurtleff

272. Epidemiology of Neoplastic Diseases. (3) Two 1½-hour lectures per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 160 or equivalent one semester course in epidemiology. Students may repeat the course, but 160. This course is intended for students who have already acquired a basic understanding of epidemiology, biostatistics, and tumor biology. The objectives of the course are to introduce the student to the epidemiology of some major site-specific cancers, to consider epidemiological approaches to the study of their causation, and to address some current problems in the field. Issues of study design and implementation will be discussed. (SP) Kirlg, Sacatario

273. Advanced Forensic Science: Physical Aspects. (4) One 2-hour lecture/discussion and three 3-hour laboratories per week. Prerequisites: Consent of instructor. Detailed analysis of advanced procedures and interpretational problems in forensic science. Focus on problems of a physical nature. (F) Thornton

274. Advanced Forensic Science: Biological Aspects. (4) One 2-hour lecture/discussion and three 3-hour laboratories per week. Prerequisites: Consent of instructor. A detailed analysis of advanced procedures and interpretational problems in forensic science. Focus on problems of a biological nature. (SP) Sensusabaugh

275. Forensic Pathology. (2) One 2-hour lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. An in-depth examination of aspects of medicolegal investigations, including sudden and unexpected natural death, time of death, characterization of injuries, analysis of medicolegal evidence, and post-mortem examination, the pathologist's role in the medicolegal system. Requires attendance at one post-mortem. (SP) Herrmann, Rogers, van Meter, Sensusabaugh
Biophysics and Medical Physics
(College of Letters and Science)

The biological sciences at Berkeley were reorganized in fall 1989. Consult staff in the Department of Molecular and Cell Biology for information on the current undergraduate program in biophysics. Undergraduate students who declared the major in biophysics or biophysics: medical physics option before fall semester 1989 may continue in the program provided they complete all degree requirements and graduate before fall semester 1993.

Graduate Program: The graduate program is administered by the Graduate Group in Biophysics and Medical Physics. This campus-wide, interdepartmental group permits interested students to receive training leading to the M.A. or Ph.D. in biophysics. Students may work under the supervision of any faculty member belonging to the group without having to satisfy other degree requirements of the department with which the faculty member is affiliated.

Undergraduate students interested in pursuing graduate work in biophysics should acquire undergraduate training in analytical chemistry and molecular biology, but individual deficiencies may be removed during the early stages of graduate study. Graduate courses in biophysics are listed in this catalog among the offerings of the Division of Biophysics and Cell Physiology of the Department of Molecular and Cell Biology. Further information is available from the Group Office, 101 Donner Laboratory, 542-0379.

Bioresource Sciences
(College of Natural Resources)

Department Office: 216 Wellman Hall, 642-6600
Major Advisers, Natural Resource Emphasis: John Doyen, 217 Wellman Hall; Wayne Getz, 121 Gillian Hall.
Animal Science Emphasis: Tom Burns, 341 Genetics and Plant Biology Building; Lynn Epstein, 141 Hilgard Hall; Genes Huisman, 251A Hilgard Hall; Lynn Huntsinger, 39 Mulford Hall; Bob Lane, 411 Wellman Hall; Peter Raabe, 208 Hilgard Hall; Norman Terry, 421A Genetics and Plant Biology Building; Loy Volkman, 251 Genetics and Plant Biology Building.

Group Major in Biological Sciences

This major program provides an interdisciplinary study of the biology of renewable natural resources and involves faculty and courses from numerous departments within the college. At the lower division level, the major calls for the traditional strong foundation in natural sciences that is characteristic of most major programs in the biological sciences. At the upper division level, students in the program select either one of the following emphases:

Emphasis on Natural Resources. The focus of this emphasis is on breadth. Selection of at least one course from each of eight distinct subject areas and wide choices of electives in upper division biology and in other natural sciences are specific advantages of this emphasis, which provides a broad background in the biological sciences and an excellent preparation for pre-med or graduate and professional studies in many allied biological sciences.

Emphasis on Animal Science. This emphasis provides a broad background in the scientific disciplines that underlie studies in veterinary and human medicine. It also serves as excellent preparation for graduate work in medicine and zoology or other animal sciences. Students are expected to develop an area of interest related to the animal sciences or the medical sciences or take the course in the dean's office or Preprofessional Advising (2224 Piedmont Avenue) should be consulted about specific courses at Berkeley that fulfill preveterinary requirements.
ermatics and statistics. For further information, consult the graduate advisors.

The M.A. degree can be obtained under Plan I or Plan II, but students may proceed directly to the Ph.D. program without obtaining the M.A. degree. The Ph.D. dissertation is administered according to Plan B.

Preparation for Graduate Study

Minimum entrance requirements consist of two full-year courses in calculus and one-year courses in mathematical statistics or biostatistics. Some entering students will not be adequately prepared in mathematics, statistics, and the subject matter areas. Some prerequisites, however, can be made up during the first year of graduate study.

Research Facilities

Graduate students in the group have direct access to a variety of specialized computers as well as the services of the University Computer Center. Research activity of the faculty currently focuses on methodological areas of biostatistical computing, and the department of the student's dissertation is administered according to the Ph.D. program. The Ph.D. dissertation will not be adequately prepared in statistical background and the surrounding civilizations. Students who wish to join the program may choose either an emphasis in Sanskrit or in an East Asian language, i.e., Chinese or Japanese. For those who choose the Sanskrit emphasis, the required secondary language will be Chinese or Tibetan; for the Chinese/Japanese emphasis, the required secondary language will be Sanskrit.

Preparation.

For admission to the graduate program the student must have completed an M.A. in one of the appropriate Asian languages or have equivalent language preparation. Early in the student's doctoral career, written examinations in two modern languages must be passed. These languages must be relevant to the student's program and have the approval of the graduate advisor. Further information about the program, including a full statement of the requirements for advancement to candidacy, is available upon request from the group office.

Business Administration

(Walter A. Haas School of Business)

Office: 350 Barrows Hall, 642-7989
Dean: To be announced

Professors:

David A. Aaker, Ph.D. Stanford University. (Gary Shansby Chair in Marketing Strategy) Strategy, advertising, market research
Frederic, E. Baldwin, Ph.D. Princeton University. Strategy, financial services, marketing systems
Louis P. Bucy, Ph.D. Northwestern University. Marketing strategies, distribution systems
James M. Carman, Ph.D. University of Michigan. Marketing strategies, distribution, service marketing
Glenn R. Carroll, Ph.D. (Paul J. Courtice Chair in Management) Stanford University. Organizational theory, industrial change
David A. Cottrell, Ph.D. Pennsylvania State University. Taxation, real estate, accounting
Earl F. Chit, Ph.D., J.D., D.H.L. (hon.) (Edward F. Kaiser Professor of Law and Geography) University of Minnesota. Business, government, trade policy, education
Robert E. Cottle, Ph.D. University of Illinois. Work organization, industrial relations, organizational change, leadership
Robert H. Edelstein, Ph.D. (Chair in Real Estate Development) Harvard University. Real estate finance and development
Edwin M. Epstein, LL.B., M.A. Yale University. Business ethics and corporate social responsibility
Mark B. Garman, Ph.D. Carnegie-Mellon University. Finance, options, arbitrage theory
Nils H. Hakansson, Ph.D., C.P.A. (Sylvan C. Coleman Professor of Finance and Accounting) University of California at Los Angeles. Investment theory, financial markets, accounting
Dorot S. Hoch, Ph.D. University of Pennsylvania. Operations research, computer systems, algorithms
Austin C. Hoggatt, Ph.D. University of Minnesota. Simulations, modeling, experimental economics
Michael L. Katz, Ph.D. Oxford University. Competitive strategy, industrial organization
Emet Koenigsberg, Ph.D. Iowa State University. Payment systems
Hayne E. Leland, Ph.D. (Arno A. Rayner Chair in Finance and Management) Harvard University. Portfolio strategies and optimal pricing
Baruch I. Lev, Ph.D. (Emile Riis Nielson Chair in Accounting) University of California at Santa Barbara. Financial regulation
James R. Lipton, Ph.D. University of Wisconsin. Organization theory, Japanese management, organization theory
Thomas A. Marshak, Ph.D. Stanford University. Economics mechanisms, decision theory
Richard A. Matza, Ph.D. University of Wisconsin. International finance, applied econometrics
Robert A. Meyer, Ph.D. Stanford University. Economics, strategy, market structure
Pamela G. Miller, Ph.D. Elitess. (Eugene E. and Catherine M. Tredwell Chair in Business Administration) Stanford University. Organizational structure, design, strategy
John G. Myers, Ph.D. Northwestern University. Advertising, communications, marketing management
Franco M. Niccolini, Ph.D. University of California at Berkeley. Psychology, brand advertising, corporate marketing
Charles A. O'Reilly, Ph.D. (Lenoir Lyon Trust Chair in Leadership and Communication) II University of California at Los Angeles. Employee communications, work culture, productivity
Stephen D. Ross, Ph.D. (L. H. Penney Chair in Accounting) University of Chicago. Accounting, investment, securities analysis
David H. Pyly, Ph.D. (Willis Harlow Booth Professor in Banking and Finance) Massachusetts Institute of Technology. Economics, international economics
Karenne A. Roberts, Ph.D. University of California at Berkeley. Organizational communication, high reliability systems
Kenneth E. Rosen, Ph.D. (California Real Estate Chair) Massachusetts Institute of Technology. Real estate, housing, mortgages
Mark E. Rubinstein, Ph.D. University of California at Los Angeles. Options and portfolio insurance
J. George Shanthikumar, Ph.D. University of Toronto. Operations research, stochastic modeling
Cari Shapiro, Ph.D. Massachusetts Institute of Technology. Competitive strategy, innovation, intellectual property, antitrust and regulation
Wallace F. Stump, Ph.D. University of Washington. Real estate and urban economics
Gary S. Trefethen, Ph.D. (Chair in Real Estate Development) Stanford University. Urban economics, real estate, macroeconomics
David Vogel, Ph.D. Princeton University. Business-government relations, American and comparative politics
Oliver E. Williamson, Ph.D. (Francis H. Burr Chair in Business Strategy) Carnegie-Mellon University. Economics of organizations, applied microeconomics
Russell S. Winer, Ph.D. Carnegie-Mellon University. Marketing, consumer choice models
Janet L. Yellen, Ph.D. Yale University. International economics, macroeconomics
Barry J. M. Blatt, Ph.D. (Emeritus) Harvard University. Financial institutions, economic behavior
Hector R. Antolin, Ph.D. (Emeritus) University of Minnesota. Accounting
Karol A. Antle, Econ. Dr. (Emeritus) Stockholm School of Economics. Economics of economic regulation, macroeconomics
Nancy D. Seiberling, Ph.D., C.P.A. (Emeritus) University of California at Berkeley. Auditing, accounting, computers
John P. Carter, Ph.D. (Emeritus) University of California at Berkeley. Finance, transportation management
C. West Churchman, Ph.D. (Emeritus) University of Pennsylvania. Ethics, statistics, psychology, systems approach
Manuel Evangel, Ph.D., J.D. (Emeritus) Stanford University. Antitrust economics, law, regulation
Michael A. Davidson, Ph.D. (Emeritus) Economics
Leonard A. Doyle, Ph.D., C.P.A. (Emeritus) Ohio State University. Accounting, economic analysis and policy
Joseph W. G. Dubin, Ph.D. (Emeritus) Stanford University. Employee relations, bargaining arbitration
Johannes Grether, Ph.D., J.D. (Emeritus) (Floyd Professor, Emeritus) University of California at Berkeley. Money, public policy, regulation
John C. Harsanyi, Ph.D. (Floyd Research Professor in Business Administration, Emeritus) Stanford University. Game theory, decision theory, economic models
Richard H. Holton, Ph.D. (E. T. Grahear Chair in Marketing and Public Policy, Emeritus) Harvard University. Marketing, marketing international business, e-commerce
Roy W. Jastram, Ph.D. (Emeritus) Stanford University. Management science
Van Dusen Kennedy, Ph.D. (Emeritus) Columbia University. Industrial relations, environment of business
Clark Kerr, Ph.D., J.D. (Emeritus) Stanford University. Industrial relations, environment of business
Shih-Ming, Ph.D. LL.D., D.S.S. University of California at Berkeley. (Emeritus) Finance, insurance, marketing
Sherman J. Masel, Ph.D. (Emeritus) Harvard University. Capital markets, investment
Maurice Moenntiz, Ph.D. (Emeritus) University of California at Berkeley. Finance, insurance, marketing
Frederic P. Morrisey, Ph.D. (Emeritus) Columbia University. Finance and public utility regulation
Jack D. Rogers, Ph.D. (Emeritus) Massachusetts Institute of Technology. Management, technology
Alan S. Westin, Ph.D. (Emeritus) University of California at Los Angeles. Economic analysis and policy
Dorothy Y. Watanabe, Ph.D. Harvard University. Corporate affairs, social responsibility
John R. Wineberg, Ph.D. (Emeritus) Massachusetts Institute of Technology. Managerial accounting, budgeting, strategic planning

Graduate Faculty:

J. Frits Staal, Ph.D. University of Madras. (Philosophy and South and Southeast Asian Studies) (Emeritus)
Joanna Williams, Ph.D. Harvard University. (History of Art) (Emeritus)

Associate Professors:

James E. Boess, Ph.D. University of Washington. (Sociology and Comparative Studies) (Emeritus)
Michel Strickmann, Ph.D. Ecole Pratique des Hautes Etudes. (Philosophy and South and Southeast Asian Studies) (Emeritus)
Barend A. van Nooten, Ph.D. University of California. (South and Southeast Asian Studies) (Emeritus)

Graduate Adviser: Lewis R. Lancaster.
Undergraduate and Graduate Programs

For a description of the undergraduate and graduate programs in business administration, see page 71.

Lower Division Courses

1. Introduction to Accounting. (3) Two hours of lecture and two hours of discussion per week. Prerequisites: Sophomore standing. The identification, measurement, and reporting of the financial effects of economic events on enterprises; the contemporary model and its origins. (F,SP)

Upper Division Courses

110. Microeconomic Analysis for Business Decisions. (3) Students will receive no credit for 110 after taking Economics 102A or 101A. Three hours of lecture and one hour of optional discussion per week. Prerequisites: Economics 1, Mathematics 16A-16B and Statistics 21 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)

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 optional 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)

112. Economics of Regulated Industries. (3) Three hours of lecture per week. Prerequisites: 110 or equivalent. Survey of the history, structure and functions of firms in the transportation, energy, communications, and financial sectors of the American economy. Application of economic analysis to the administrative regulation of prices, incomes, and services. Emphasis on the governmental alternatives to economic regulation, including market failure and activity, that result from 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)

113. Managerial Economics. (3) Three hours of lecture per week. Prerequisites: 110 and 111 or equivalents. Theories and practice of decision making in business firms, utilizing the concepts and techniques of managerial economics. The business decisions to be investigated include pricing policies, internal transfer prices, and various choices under uncertainty. (F,SP)

114. Forecasting for Managerial Decisions. (3) Three hours of lecture per week. Prerequisites: 110 and 111 or equivalents. Theory and analysis of the long-run and short-run forecasts of economic activity. (SP)

115. Management in the Public and Not-For-Profit Sectors. (3) Three hours of lecture per week. Prerequisites: 110. Economic basis of the public and not-for-profit sectors. Institutional arrangements as they impinge on operations in the public sectors. Emphasis on management techniques and tools to use in a nonprofit environment. (F)

120. Managerial Accounting. (3) Two hours of lecture and 2 hours of discussion per week. Prerequisites: 1. The use of accounting systems and their outputs in the process of managing an enterprise. Classification and analysis of decisions on several bases: for various uses; budgeting and standard cost accounting; analyses of relevant costs and other data for decision making. (F,SP)

121. Financial Accounting I (4) Three hours of lecture and 2 hours of discussion per week. Prerequisites: 1 and 110. An introduction to the theory and practice of financial accounting. The measurement and reporting of the economic effect of events involving working capital and long-term plant assets, investment in securities, intangible assets. (Required for those specializing in accounting.) (F,SP)

122. Financial Accounting II. (4) Three hours of lecture and 2 hours of discussion per week. Prerequisites: 121. Continuation of 121. Sources of long term capital; funds statements, financial analysis, accounting for partnership and consolidated financial statements, adjustments of accounting data using price index; accounting for the financial effects of pension plans; other advanced accounting problems. (Required for those specializing in accounting.) (F,SP)

124. Cost Accounting. (3) Two hours of lecture and 3 hours of discussion per week. Prerequisites: 1 and 120. An intensive study of basic cost accumulation systems and refinements thereof used to determine costs of products or activities in various types of enterprises. (SP)

125. Administrative Accounting. (3) Students will receive no credit for 125 after taking 1 or 120. Three hours of lecture per week. Introduction to accounting and its uses in analyzing, planning, and controlling the operations of organizations of all types. (For students interested in administration or management who are not majors in business administration.) (F,SP)

126. Auditing. (4) Three hours of lecture and one 1-hour discussion per week. Prerequisites: 121 or 122 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)

127. Accounting Systems for Management. (4) Three hours of lecture and one 1-hour discussion per week. The study of accounting systems, including computer-oriented systems, with an emphasis on the information and control functions of the management decision-making process. The COBOL language will be used. (F)

128A. Federal Income Taxation I. (4) Three hours of lecture and one 1-hour discussion per week. Prerequisites: 1 and 120; 121 recommended. Determination of individual and corporation tax liability; influence of federal taxation on economic activity; tax considerations in businesses and investment decisions. (F,SP)

128B. Federal Income Taxation II. (4) Three hours of lecture and one 1-hour discussion per week. Prerequisites: 128A. A study of federal taxation of corporations, shareholders, partnerships and partners; economic and policy analysis of the current structure and proposed reforms; introduction to tax planning and research. (SP)

129. Field Study in Accounting. (3) Field study course. Prerequisites: 122 or equivalent or consent of instructor. A planned program of exposure to actual accounting practice designed to broaden students' perspective of the concepts and theory of accounting. Assignment to specific corporation, CPA firms, or government agencies for orientation and work experience. Research reports based on field study required. (F,SP)

130. Financial Management. (4) Three hours of lecture and one 1-hour discussion per week. Prerequisites: 110 and 120. Analysis and management of the flow of funds through an enterprise. Cash management, source and application of funds, term loans, types and sources of long term capital. Capital budgeting, cost of capital, and financial structure. Introduction to capital markets. (F,SP)

132. Money and Capital Markets. (3) Three hours of lecture per week. Prerequisites: 111 and 130. Organization, 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)

133. Investments. (3) Three hours of lecture per week. Prerequisites: 130 or consent of instructor. Sources of and demand for investment capital, oper-
ations of security markets, determination of investment policy, and procedures for analysis of securities. (F,SP)

139. Seminar in Finance. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Attainment of prescribed grade levels in 130 and/or 132 or equivalent, ECON 1, Math 1A-1B, and Statistics 21, or equivalents. Survey of management science and its applications to business problems. Topics covered include linear and integer programming, project management, dynamic programming, inventory control, queuing theory, and simulation. (F,SP)

140. Introduction to Management Science. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Computer Science 3 or equivalent. Survey of the basic issues in production and operations management and of concepts and methodologies a manager can use to address these issues. Topics include plant design, plant and warehouse location, capacity expansion, and new products, and acquisition of new technologies. (F)

142. Production and Operations Management. (3) Three hours of lecture per week. Prerequisites: 140 or consent of instructor. A survey of the concepts and methodologies for management control of production and operations systems. Topics include inventory control, material requirements planning for multi-stage production systems, aggregate planning, scheduling, and production distribution. (SP)

145. Applications of Linear Models to Decision Making. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 140 or consent of instructor. A discussion of problems faced by decision-makers to the analysis of mathematical models consisting entirely of linear relationships among the model's parameters. This course will concentrate on the formulation and analysis of such linear models. (F)

146. Applications of Stochastic Models to Decision Making. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 140 or consent of instructor. Stochastic and dynamic models of decision analysis. The course includes treatment of Markov chains, decision-making under uncertainty, inventory management, and control systems, and quality control systems. The techniques presented include queueing theory, computer simulation, dynamic programming, and network analysis. Particular emphasis is placed on application of models to actual situations in business, industry, and government. (SP)

147. Computers and Modern Organizations. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Computer Science 3 or consent of instructor. 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, recent advances in computer science, and the impact of scientific versus business problems, information storage and retrieval, compilers, problem-oriented languages, simulation models, current developments in computer systems. (F,SP)

148. MIS: Business Systems Planning and Design. (4) Three hours of lecture and one hour 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 range from systems analysis and design, implementation of data processing systems with emphasis on applications to business problems, market research, market structure, marketing cost and efficiency; public and private regulation; the development of marketing programs including decisions involving products, price, promotional distribution. (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 are addressed. The interaction among technology, environment, behavior, and goals is considered. Alternate theoretical models are discussed. (F,SP)

151. Management of Human Resources. (3) Three hours of lecture per week. Prerequisites: 150 or consent of instructor. The design of systems of rewards and punishment, and manpower development. The integration of selection, placement, training, personal evaluation, and career ladders within an on-going organization. Role of the staff manager. Introduction of change. Implications for research on management problems and policies. (SP)

154. Industrial Relations. (3) Students will not receive credit for both Economics 151 and Business Administration 154. Three hours of lecture per week. An analysis of union, white collar, and professional employee relations. Background and functioning of employer and employee organizations. Functioning of labor markets and wage and income security issues. Questions of public policy in labor economics and industrial relations. (F)

155. Labor and the Law. (3) Three hours of lecture per week. Analysis of the issues arising out of legal, administrative, and judicial efforts to define the rights, duties, and responsibilities of employers and labor relations. Includes programs to deal with racial, ethnic, sex, and age discrimination as well as the law of union-management relations. (F)

156. Collective Bargaining Systems. (3) Three hours of lecture per week. The nature, institutions, and processes of collective bargaining. Analyses of labor-management issues and their economic and political significance. Comparative analyses of industrial relations systems in major industries, in public employment, and in other countries. Includes opportunities for simulated bargaining. (F)

159. Special Topics in Organizational Behavior. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: BA150 or equivalent or consent of instructor. Analysis of recent literature and development related to such topics as organization development, environmental determinants of organization structure and decision making behavior, management of professionals and management in temporary structures; cross cultural studies of management and organizations. (F)

160. Marketing. (3) Two 1 1/2-hour lectures per week. Prerequisites: 110 or equivalent. The evolution of marketing, market structure; market size; marketing costs and efficiency; public and private regulation; the development of marketing programs including decisions involving products, price, promotional distribution. (F,SP)

161. Introduction to Marketing Research. (3) Two 1 1/2-hour lectures per week. Prerequisites: 160. Marketing research objectives; qualitative research, surveys, experiments, sampling, data analysis. (F,SP)

162. Sales Management. (2) Two hours of lecture per week. Prerequisites: 180. Analysis of selling function, sales management, and channel management within the firm. (F,SP)

163. Organizational Buying Behavior. (2) Two hours of lecture per week. Prerequisites: 160. The interaction of buyer and seller in a non-ultimate consumer environment. Development of buying policies in: quality and product quality; specifications; make-buy-lease decisions; pricing and terms of sale; energy and resource conservation; negotiation. (F)

165. Advertising. (2) Two hours of lecture per week. Prerequisites: 160. Basic concepts and functions of advertising in the economy; consumer motivation; problems in utilizing and measuring and its effectiveness. (F,SP)

166. Retailing. (2) Two hours of lecture per week. Prerequisites: 160. History and development of retail management types; geographical structure of retail trade; assortments of goods and services; store management; government regulations. (F,SP)

168. Marketing Policies and Problems. (2) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: 160 or consent of instructor. Special emphasis on marketing strategy 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 and national priorities. The expanding role of the corporation in dealing with social problems and issues. (F,SP)

171. Business, Government, and Law in the American Political Economy. (3) Three hours of lecture per week. Prerequisites: 175 and/or 170 recommended. In this course, students examine the complex relationship between the "public and private" sectors in the American political economy. Focus is on diverse interactions among governmental institutions, business organizations, and legal processes which provide the framework for both economic and political activity in the U.S. (SP)

172. Business in its Historical Environment. (3) Two 1 1/2-hour lectures per week. This course will examine selected aspects of the history of American business. Emphasis will be placed on developments of the large corporation, the development of modern managerial techniques, and the changing relationship of business, government, and labor. (F)

175. Legal Aspects of Management. (3) Two 1 1/2-hour lectures per week. An analysis of the legal and ethical issues, 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)

177. Legal Aspects of Business Transactions. (3) Two 1 1/2-hour lectures per week. Prerequisites: 175; 180 recommended. A review of the legal implications of certain commercial business transactions and situations, including problems arising in sales, installment buying, inventory financing, obtaining and extending credit, negotiable instruments, and insolvency, with emphasis on the Uniform Commercial Code. (F,SP)

178. Legal Aspects of Real Estate. (3) Two 1 1/2-hour lectures per week. Prerequisites: 180 recommended. The law affecting ownership and use of real property; transfers, titles, development rights, and the regulation thereof in the public interest, (SP)

180. Introduction to Real Estate and Urban Land Economics. (3) Two 1 1/2 hours lectures per week. Prerequisites: Econ 1 or equivalent; Math 1A-1B recommended. The nature of real property; market analysis; construction cycles; mortgage lending; equity investment; metropolitan growth; urban land utilization; 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 role of value estimates in private land-use and real estate investment decisions and in 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 and credit on demand; equity investment criteria; public policies in real estate finance and urban development. (SP)

188. Introduction to International Business. (3) One 2-hour lecture and one hour discussion per week. Prerequisites: Senior standing. Introduction to Accounting, Micro and Macro Economics, by involving environmental, economic, political, and social constraints on doing business abroad; effects of over-
seas business investments on domestic and foreign economies; foreign market analysis and operational strategy of a firm; management problems and development potential of international operations. (F,SP)

190. Strategic Planning: Models and Design. (3) Three hours of lecture per week. Concepts of strategy and planning are developed. Several major types of planning models and techniques are evaluated for strategic-policy choices, organizational design, and the allocation of resources.

195. Special Topics in Business Administration. (1-3) One to three hours of lectures per week. Prerequisites: Undergraduate standing. 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)

198. Directed Study. (1-4) May be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor.

199. Supervised Independent Study and Research. (1-4) May be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Enrollment is restricted by regulations listed in the General Catalog. (F,SP)

Graduate Courses

200. Statistical Analysis For Business Decisions. (3) Three hours of lecture and one hour of discussion per week. This course provides an introduction to probability theory and statistical analysis and their applications to the problems of business. Topics include: probability distributions, sampling and estimation, hypothesis testing, regression analysis, nonparametric statistics and time series analysis. (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 emphasis is on the determination of prices, inputs, and outputs; effects of the state of the competitive environment on business policies. (F,SP)

201B. Economic Analysis for Business Decisions II. (3) Three hours of lecture and one hour of optional discussion. Prerequisites: 201A or equivalent. Theories of fiscal and monetary policy, as well as other macroeconomic policies, are a central topic. The issues and the evidence will be discussed. Other topics to be covered range from the specifics of the U.S. balance of payments situation today to broader problems associated with economic growth and decay in the world. (F,SP)

202A. Financial Reporting. (3) Two hours of lecture and one hour of discussion per week. A study of accounting measurements for general purpose financial reports. The object of the course is to provide a working knowledge of and a clear understanding of the contents of published financial statements. (F)

202B. Managerial Accounting. (3) Course may be repeated for credit. Three hours of lecture plus one hour optional tutorial session per week. 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 asset management situations 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 into portfolio theory. Course will also provide introductions to asset pricing theory for primary and derivative assets and to the principles governing corporate financial arrangements and contracting. (F)

204. Information and Management Science. (3) Two hours of lecture and two hours of discussion per week. Prerequisites: 200 (may be concurrent). The management science portion (about 80%) surveys the evaluation of management research (MIS and computer software) to business decision making. Topics include linear programming, project management, inventory control, decision analysis, and simulation. The programming systems portion (about 20%) surveys how computers are used to store and retrieve information. Topics include database management, systems analysis and design, and telecommunications and distribution. (F,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 innovation will be analyzed from multiple theoretical perspectives. Implications for the management of organizations will be illustrated through examples, cases, and exercises. (F,SP)

206. Marketing Organization and Management. (3) Two 1 Â½-hour lectures per week. Prerequisites: 201A or equivalent. Topics include an overview of the marketing system and the marketing concept, buyer behavior, market segmentation and market targeting, decision making, marketing structures, and evaluation of marketing performance in the economy and society. (F,SP)

207. Business and Public Policy. (3) Two 1 Â½-hour lectures per week. Prerequisites: 201A or equivalent. These topics include an overview of the management of the M.B.A. student (who has not had equivalent training) some knowledge and understanding of the ideas, concepts, rules, institutions, and issues that characterize the political, social, legal, and historical environment within which the business system functions. Instructors approach the course material from the viewpoint of a variety of academic disciplines, including law, economics, history, sociology, and political science, as well as varied practical and theoretical perspectives. (F,SP)

210. Market Structure and Economic Performance. (3) Three hours of lecture per week. Prerequisites: 200, 201A-201B, 204 or equivalents. Examines optimal production and pricing policies for firms in competitive environments; optimal strategies through time; strategic interactions and imperfect information. How differing market structures and government policies (including taxation) affect output and pricing decisions. Social welfare implications of decisions by competitive and monopoly firms. (F,SP)

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 markets and substitutes for markets, 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 administrative regulation of pricing, investment, and service quality. Analysis of critical problems in regulated industries, including transportation, communication, energy, and financial sectors. (F,SP)

213. Statistical and Econometric Methods for Business. (3) Three hours of lecture per week. Prerequisites: 202A and Economics 201A-201B. A critical evaluation of recent accounting literature emphasizing the use of statistical tests. (F,SP)

214. Statistical Analysis For Business Decisions. (3) Three hours of lecture per week. Prerequisites: 202A, 201A-201B, 204 or equivalents. The course will focus on a variety of currently used forecasting techniques. These include econometric techniques and purely extrapolative (time series) methods, as well as combinations of more than one procedure. The emphasis is on data analysis, data interpretation, and the communication of results and their relationship to business decision making. (F,SP)

215. Management in the Public and Not-For-Profit Sectors. (3) Three hours of lecture per week. Prerequisites: 201A-201B, or equivalents; Programming-programming-budgeting systems and benefit-cost analysis for resource allocation and planning in the public use of pricing in the public sector. Efficiency and equity when profit criteria are absent. Applications in natural resources, medical services, transportation, and education. (F)

217. Seminar in Applied Economics. (3) Three hours of lecture per week. Prerequisites: 202A or equivalent. Topics will vary with the interest of the instructor. A description of the topics and objectives of the seminar will be available to prospective students each year. (F,SP)

220A. Financial Accounting I. (4) Three hours of lecture and one Â½-hour discussion per week. Prerequisites: 202A or equivalent, this course is designed for the following course intensively the theory and practice of financial accounting, including asset and liability measurement, income determination, financial reporting, and financial analysis. Each student will be assigned to a topic on which he or she will study in depth and present to the class. (F,SP)

221. Seminar in Accounting Theory. (3) Three hours of seminar per week. Prerequisites: 220A or equivalent. A course in the evolution of accounting theory from ancient times to the present, emphasizing literature of the last 30 years dealing with issues in the measurement of wealth and income and the standards-setting process. (F)

222. Financial Information Analysis. (2) Two hours of lecture per week. Prerequisites: 221A recommended. Issues of accounting information evaluation with special emphasis on the use of financial statements by decision makers external to the firm. The implications of recent research in finance and accounting for external reporting issues will be explored. Emphasis will be placed on models that describe the user's decision context. (F,SP)

223A. Doctoral Seminar in Accounting I. (3) Students may not receive credit for 223A and 238A. Three hours of seminar per week. Prerequisites: 220A or equivalent. A critical evaluation of recent 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. (1-3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: 220A or equivalent, 292A and Economics 201A-201B. A critical evaluation of recent accounting literature involving empirical research. (F,SP)

223C. Doctoral Seminar in Accounting III. (2) Two hours of seminar per week. Prerequisites: 220A or equivalent, 292A and Economics 201A-201B. A critical evaluation of recent accounting literature with emphasis on financial accounting. (SP)

225. Doctoral Seminar in Accounting IV. (2) Two hours of seminar per week. Prerequisites: 220A or equivalent, 292A and Economics 201A-201B. Exploration of issues related to the internal accounting systems of large firms. First part of the course focuses on the theory of mechanisms and second part applies this theory to a variety of managerial accounting questions. (SP)

224. Managerial Accounting. (3) Three hours of lecture per week. Prerequisites: 220A and 220B or equivalents. This course introduces the theory of management accounting, its application in modern organizations, and related problem areas included in recent CPA and CMA examinations. (F)
225. Advanced Topics In Accounting. (2) Two hours of lecture per week. Prerequisites: 220A and 220B or equivalent. Seminar in advanced topics in accounting selected from subjects from auditing theory, control aspects, management information systems, and managerial accounting.

228A. Income Taxation I. (4) Three hours of lecture and one 1/2-hour discussion per week. Prerequisites: 220A and 220B or equivalent. The study of the fundamentals of income taxation relating to individuals and business entities are also introduced to tax research, tax planning, and tax policy. (F,SP)

228B. Income Taxation II. (2) Two hours of lecture per week. Prerequisites: 228A or equivalent. The study of corporate tax problems, partnership tax problems, subchapter S corporations, estate and gift taxation, income taxation of estates and trusts.

228C. Seminar In Income Taxation. (2) Two hours of lecture per week. Prerequisites: 228A or equivalent; 228B recommended. Tax research, tax planning, and tax policy.

229. Management Planning and Control Systems. (2) Two hours of lecture per week. Prerequisites: All core courses Planning and control systems are an essential tool in the management of modern organizations. Strategic planning and management control are studied through the use of cases illustrative of management practice in both public and private organizations.

232. Financial Institutions and Markets. (3) Three hours of lecture and one hour of optional discussion per week. Prerequisites: 203. This course will analyze the role of financial markets and financial institutions in allocating resources. The course will be divided into debt contracts and securities and on innovations in the bond and money markets. The functions of commercial banks, investments banks, and other financial intermediaries will be covered and aspects of the regulation of these institutions will be examined. (F,SP)

233. Investments. (3) Three hours of lecture and one hour of optional discussion per week. Prerequisites: 203. This course will examine four different types of asset markets: equity markets, fixed income markets, futures markets and options markets. It will focus on the valuation of assets in these markets, the empirical evidence on asset valuation models, and strategies that can be employed to achieve various investment goals. (F,SP)

234. Corporate Finance. (3) Three hours of lecture and one hour of optional discussion per week. Prerequisites: 200. This course will study the principles underlying alternative financial arrangements and contracts and their application to corporate financial management. The course will examine the role of incentive, moral hazard, and principal-agent problems, that arise as a consequence of asymmetric information, government intervention, managerial incentives and taxes, on financial decisions regarding capital budgeting, dividend policy, capital structure and mergers. (F,SP)

235. Advanced Topics in Financial Institutions and Financial Markets. (2) May be repeated for credit. Two hours of lecture per week. Prerequisites: 232. Normative models and institutions, regulations and financial institutions, the analysis of money and capital markets, and empirical studies on financial institutions and financial markets. Topics to be covered will vary. (SP)

236. Futures and Option Markets. (3) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: 233. Normative models for investment management, valuation of securities, behavior of security prices, the function and regulation of security markets, and empirical studies on market efficiency. (F)

237. Advanced Topics in Corporate Finance. (2) May be repeated for credit. Two hours of lecture per week. Prerequisites: 234. Normative models of financial decisions of business firms, financial regulation and the business firm, and empirical studies in business finance. (F)

238A-238C. Doctoral Seminar In Finance. (3;3;3) Students may not receive credit for 223A and 238A. Three hours of seminar per week. Prerequisites: 203 and 292C or other introduction to decision theory; Economical and mathematical models in financial economics, including the theory of intertemporal choice under certainty or uncertainty, portfolio optimization, asset market equilibrium, valuation of uncertainty, problems in management, financial econometrics, and empirical verification of financial models. (F,SP)

240. Introduction to Management Science. (4) Three hours of lecture and one 1/2-hour of discussions per week. Prerequisites: 200 and 204 or equivalents. Survey of management science and its application to business problems. Topics to be covered include: matrix algebra, linear programming, integer programming, nonlinear programming, network optimization, queuing theory, Markov chains, dynamic programming, and heuristics. (F,SP)

241. Strategic Planning of Production and Operations. (2) Two hours of lecture per week. Prerequisites: 240 or consent of instructor. Strategies issues involved in planning and the logistics of a firm and models of those functions that are useful for the firm's strategic planning. Topics include models of a firm's capacity expansion, facility location, and technology selection decisions; learning curve strategies; and industry cost models. (F,SP)

242A. Introduction to Operations Management. (3) Two 1/2 hour lectures per week. Prerequisites: 204 or consent of instructor. An introduction to production and operations management open to all Business School students. The course includes two or three visits to manufacturing plants and discussions of manufacturing methods (continuous production, batch production, multiple products, assembly line and various hybrids of pure systems). Special attention will be paid to the analysis of the technologies and systems used in the manufacturing plants visited. (F)

242B. Operations Management. (3) Two 1/2 hours lectures per week. Prerequisites: 204 or consent of instructor. This course is intended for students with an interest in management of manufacturing and of service facilities. The problems and techniques of planning, construction, scheduling, quality assurance and performance measurement are discussed. Case studies are used to examine decision making in the manufacturing environment. (SP)

243. Decision Analysis. (2) Two hours of lecture per week. Prerequisites: 200, 204 or equivalent. Procedures for solving decision problems. Foundations of the expected-utility rule with personal probabilistic. Current applications of decision analysis. (F)

244. Competitive Decision Making. (2) Two hours of lecture per week. Prerequisites: 243 or consent of instructor. A survey of mathematical models of bargaining, bidding, and negotiations. This course will consider the interaction among the decisions of several decision makers, each with different goals and different information. Examples in oil leasing, contract bidding, and labor negotiations. (SP)

246. Advanced Topics in Management Science. (2-3) May be repeated for credit. One to three hours of lecture per week. Prerequisites: Consent of instructor. This course will focus on a particular topic in management science and its application to decision making. Topics will include: being integer programming models, network models, stochastic programming, Markov decision models, continuous-time probability models, and management information systems. (F,SP)

247. Simulation for Business Decisions. (2) Two hours of lecture per week. Prerequisites: 200, 204 or equivalents. Uses of computer modeling in business decision making contexts. Structure of simulation models; simulation languages, data structures, techniques, and interpretation of results. Course involves hands-on modeling via simulation projects, as well as technique-oriented lectures. (F,SP)

248A. MIS: Data Management. (4) Three hours of lecture and one and half hour discussion per week. Prerequisites: 204. This course covers several important topics in business data processing including file and data base systems. The problem of data management in large organizations is analyzed, and the logical modeling process and its strategic importance are studied. Other topics include future developments in computer technology and acquiring and managing computer resources. A team project consists of the formal and logical interpretation of a relational database management system package. (F)

248B. MIS: Systems Analysis and Design. (3) Two 1/2-hour lectures per week. Prerequisites: 204. The goal of this course is to provide future general managers and information systems specialists with expertise in aspects of utilizing information in decision making. Topics covered include the role of information systems in organizations, systems analysis, trade-offs and economic considerations (system's development, hardware selection and review of technological advancements relevant to modern organizations. (F,SP)

248C. MIS: Managerial and Organizational Issues. (2) Two hours of lecture per week. Prerequisites: 204. This course covers the management and organizational issues associated with the implementation and growth in organizations of computer-based administrative information systems. A management perspective is maintained throughout and technical issues introduced are subordinate to this management perspective. (F,SP)

248D. MIS: Telecommunication and Distributed Processing. (3) Three hours of lecture per week. Prerequisites: 204. This course is intended for students who wish to gain better understanding of one of the most important issues facing today--designing, implementing, and managing telecommunication and distributed computer systems. The following topics are covered: a survey of networking technologies; the selection, design and management of communication systems; distributed data processing; office automation; and management of personal computers in organizations. (F,SP)

249A. Introduction to Manufacturing Information Systems. (2) Two hours of lecture per week. Prerequisites: 204 or equivalent, or consent of instructor. This course is designed for doctoral-level students who wish to learn about the issues in manufacturing functions and the need for efficient information systems to alleviate some of these. It will cover the introduction to various forms of manufacturing systems and some manufacturing control issues, this course will focus on the use of efficient information systems in manufacturing. (SP)

249B. Models of Manufacturing Systems. (3) Three hours of lecture per week. Prerequisites: 200, 262A or 262A, or equivalent; 249A or consent of instructor. For Ph.D. students trained in optimization theory and stochastic processes. Various forms of manufacturing systems will be reviewed and various basic issues arising in such systems will be described. Models to address these issues will be formulated and analyzed using the state-of-the-art Management Science (Operations Research) techniques. Analysis toChapter are not limited to automatic transfer lines, flow lines and assembly systems, dynamic job shops, and flexible manufacturing systems. (F)

249C. Models of Management Information Systems. (3) Three hours of lecture per week. Prerequisites: 204 or equivalent, or consent of instructor. The purpose of this course is to explore analytical methods used for the analysis and enhancement of information systems. The students are expected to acquire the ability to define critical current problems in the area of information systems, and to model and formulate such problems and provide a comprehensive analysis. The material presented in the lectures will prepare the student in background and tools for such an analysis. (SP)

250. Organization Diagnosis and Change. (3) Three hours of lecture per week. Prerequisites: 205. Course examines current models of strategy, structure,
process interaction and their historical foundations. Students will apply current theory to traditional cases and to current examples of organization adaptation in the business press. In addition the course will examine in detail emerging patterns of strategy, structure, and process—the beginnings of what appear to be "new" organizational forms. Finally comparisons will be drawn between U.S. and foreign patterns of adaptation. (SP)

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, placement, training, 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 negotiation process, including negotiations among buyers and sellers, managers and subordinates, company units and competitors, 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 negotiation situations. Emphasis is placed 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 analyze government regulation of personnel practices such as age, race and gender discrimination, affirmative action, equal pay and comparable worth, employment at will, and union relations. Discussion of case studies will focus on corporate and bureaucratic administration, with an emphasis on the interests 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 coordination in organizations, personality, socialization, leadership, psychological factors affecting human behavior and performance in work places. Topics include motivation, job design, human information processing, socialization, commitment, and leadership processes in organizations. (F,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 industrial-organizational behavior, including its sociological, political and economic foundations. Topics include: bureaucracy, authority, power and politics, control, technology, institutional theory, 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 control, internal labor markets, and implicit contracts. (F)

254D. Special Research Topics in OBIR. (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. Prerequisites: 254A, 254B, or 254C. Possible topics include: history of organizational research; human resource management research; comparative management; and business policy and strategy. Content varies from year to year. (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)

256. Collective Bargaining. (3) Three hours of lecture per week. Studies of the bargaining process; the legal basis of collective agreements, including contract negotiation and arbitration of grievances; processes of disputes settlement; comparative international systems. Includes a simulated bargaining project. (F)

257. Human Behavior in Organizations. (3) Three hours of lecture per week. Prerequisites: 205 or equivalent, or consent of instructor. A study of the social and psychological factors affecting human behavior and performance in work places. Topics include motivation, job design, human information processing, socialization, commitment, and leadership processes in organizations. (F,SP)

258. Technology, Organization, and Environment. (3) Three hours of lecture per week. Prerequisites: 205 or equivalent, or consent of instructor. A consideration of the various ways environment and technological factors impinge upon the structure and management of organizations. Topics include organization growth, structure, control systems, productivity, and social change. Emphasis is placed on the role of third parties in negotiating disputes. (SP)

259A. Special Topics in Organizational Behavior and Industrial Relations. (2-3) May be repeated for credit. Two or three hours of lecture for 15 weeks or four to six hours of lecture for 7½ weeks. Prerequisites: 205 or equivalent, or consent of instructor. Analysis of recent literature and developments related to such topics as organizational development; environmental determinants of organization structure and decision-making behavior; management of professionals, and management in temporary structures; cross-cultural studies of management organizations, and industrial relations systems and practices are examined. (F,SP)

259B. Special Topics in Organizational Behavior and Industrial Relations. (2-3) May be repeated for credit. Two or three hours of lecture for 15 weeks or four to six hours of lecture for 7½ weeks. Prerequisites: 205 or equivalent, or consent of instructor. Analysis of recent literature and developments related to such topics as organizational development; environmental determinants of organization structure and decision-making behavior; management of professionals, and management in temporary structures; cross-cultural studies of management organizations, and industrial relations systems and practices are examined. (F,SP)

260. Consumer Behavior. (2) One 2-hour lecture per week. Prerequisites: 205 or equivalent. Examines concepts and theories from behavioral science useful for the understanding and prediction of market place behavior and demand analysis. Emphasizes applications to the development of marketing policy planning and strategy and to various decision areas within marketing. (F)

261A. Marketing Research: Techniques and Data Analysis. (1) One two-hour and one 1½-hour laboratory per week. Prerequisites: 200 or comparable statistical course. This course develops the skills necessary to plan and implement an effective market research study, including research design, experimental and correlational studies of marketing data, and effective reporting of technical material to management. Students can utilize data from client to prepare a market research study during the course. Course intended for students with substantive interests in marketing. (F)

261B. Introduction to Marketing Research. (2) One 2-hour lecture per week. Prerequisites: 200, 206, or equivalent. This course examines the strengths and limitations of marketing research. Emphasis is placed on obtaining, analyzing and interpreting data in marketing research studies. (F)

262A. Marketing Development: Developing Marketing Plans. (3) Two 1½-hour lectures per week. Prerequisites: 202E and 206, or equivalent. Formerly 252 BA 562. The focus of this course is on developing students 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. Marketing Management: Services. (3) Two 1½-hour lectures per week. Prerequisites: 202B and 206, or equivalent. Formerly 252 BA 562. The focus of this course is on developing students 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 designed for those who have a strong interest in marketing programs for services and wish an integrated approach. (F)

263. Product and Price Management. (2) One 2-hour lecture per week. Prerequisites: 202B, 206, or equivalent. Analysis of methods of new product development and introduction, product portfolio management, and pricing tactics in a variety of settings for new and mature products. (SP)

264. Industrial Marketing Management. (2) Two hours of lecture per week. Prerequisites: 202B, 205 or equivalent. Analysis of the special problems of marketing industrial projects: demand estimation, channel management, sales force management, leasing and terms of sale. (SP)

265.Advertising Management. (2) One 2-hour lecture per week. Prerequisites: 202E, or equivalent; 260 is recommended. A specialized course in advertising, focusing on management and decision-making. Topics include advertising strategy, copy, promotion media decisions, budgeting, and evaluation of theories, models, and other research methods appropriate to these decision areas. Other topics include social/economic issues of advertising by nonprofit organizations. (SP)

266. Channels of Distribution. (2) Two hours of lecture per week. Prerequisites: 205 or equivalent. Formerly 262. 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 linked. This is accomplished, first, through studying the broad economic and social forces which govern the channel evolution. It is completed through the examination of topics to select, manage and motivate channel partners. (F,SP)

267. Strategic Marketing Planning. (2) One 2-hour seminar per week. Prerequisites: 202B, 203, 205, 206. Strategic planning theory and methods with an emphasis on customer, competitor, industry and environmental analysis and application to strategy development and choice. (F)

268. Seminar in Marketing Management. (2) May be repeated for credit. One 2-hour seminar per week. Prerequisites: 206, or equivalent. Advanced selected topics for MBA students. Topics will vary from year to year. (F,SP)

269A. Seminar in Marketing: Buyer Behavior. (2) One 2-hour seminar per week. Prerequisites: Consent of instructor. Advanced topics seminar intended principally for Ph.D. students but open to advanced MBA students. (F)

269B. Seminar in Marketing: Decision Models. (2) One 2-hour seminar per week. Prerequisites: Consent of instructor. Advanced topics seminar intended principally for Ph.D. students but open to advanced MBA students. (F)

269C. Seminar in Marketing: Marketing Systems and Strategy. (2) One 2-hour seminar per week. Prerequisites: Consent of instructor. Formerly 256D. Advanced topics seminar intended principally for Ph.D. students but open to advanced MBA students. This
section will focus on marketing theory and the development of marketing thought. (Course offered alternate years.) (F,SP)

289D. Special Research Topics in Marketing. (2) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: Ph.D. student or consent of instructor. Research focuses in marketing not ordinarily covered in 289A, 289B, 289C. Content varies from year to year. (Course offered alternate years.) (F,SP)

270. Seminar on the Modern Corporation. (3) Two 1-hour seminar sessions per week. Prerequisites: 207 or equivalent in depth of one or two of the major issues rising out of the role of the large corporation in modern society. Topics have included social policy and responsibility, implications of social change for approaches to corporate governance, and interactions between private economic institutions and the social, political, and legal systems. (SP)

271. Seminar on the Interaction of Business and Government. (3) Two 1-hour seminar sessions per week. Prerequisites: 207 or equivalent in depth of one or two of the major issues rising out of the role of the large corporation in modern society. Topics have included social policy and responsibility, implications of social change for approaches to corporate governance, and interactions between private economic institutions and the social, political, and legal systems. (SP)

272. Seminar in Business and Public Policy. (3) Two 1-hour seminar sessions per week. Prerequisites: 207 or equivalent, or consent of instructor. Students in this seminar undertake a comparative analysis of a selected number of capitalist economic systems. The primary objective is to develop an understanding of the diverse historical, political, and cultural factors that underlie the contemporary political, social, and legal environment of the corporate enterprise. (F)

273. Topics in the Management of Nonprofit Organizations. (3) Three hours of lecture per week. Prerequisites: MBA core courses, or consent of instructor. This course is designed as a "capstone" course for second-year MBA students who have an interest in nonprofit organizations, either as potential managers or as members of Board of Trustees. It will be interdisciplinary in nature and build upon course work in all areas of business administration. Topics include, but not limited to: 1) fund-raising; 2) management of volunteers, 4) financial management issues and 5) economic relationships with government. (SP)

275. Legal Aspects of Management and the Market System. (3) Two 1-hour seminar sessions per week. Prerequisites: 207 or 207T, or consent of instructor. This course is designed as a "capstone" course for second-year MBA students who have an interest in nonprofit organizations, either as potential managers or as members of Board of Trustees. It will be interdisciplinary in nature and build upon course work in all areas of business administration. Topics include, but not limited to: 1) fund-raising; 2) management of volunteers, 4) financial management issues and 5) economic relationships with government. (SP)

279A. Institutions, Interest Groups and Public Policy. (3) Three hours of lecture per week. Prerequisites: Ph.D. student or consent of instructor. Surveys recent literature on public decision-making in government institutions, emphasizing a systematic framework for evaluating public policy. Course focuses on the new institutionalism in political science, applies the methods of rational choice theory to political problems, and links relevant theoretical and empirical literature. The course covers political science, public policy, institutions, and implications of public choice for corporate strategy and business-government relations. (SP)

279B. The Political Economy of Capitalism. (3) Three hours of seminar per week. Prerequisites: Ph.D. student or consent of instructor. Comprehensive introduction to historical development of contemporary capitalism in Europe and the United States. Class will (1) compare the "classics" in political economy and their alternative explanations of markets, politics, class and culture in industrial development; (2) provide overview of the history of the U.S. economic system and business structure; and (3) study the development of business-government relations and public policy toward business. (F)

279C. The Corporation and Society. (3) Three hours of seminar per week. Prerequisites: Ph.D. student or consent of instructor. Three purposes: (1) analyze the evolution of the modern corporation into its current institutional form, subject to a variety of forces and expectations regarding its economic, social and political roles; (2) examine empirical research on business and government relations, the structure of inter-organizational relations, and relations between corporations and shareholders; (3) assist students in developing individual research on the corporation and society. (SP)

280. Real Estate and Urban Land Economics. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Intensive review of literature in the theory of land utilization, urban growth, and real estate market behavior; property rights and valuation; residential and commercial markets; construction; debt and equity financing, public controls and policies. (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 factors in urban development: modeling the urban economy; growth and decline of urban areas; selected policy issues: housing, transportation, financing, local government, urban planning and neighborhood change are examined. (F)

283. Real Estate Financing. (3) Three hours of lecture per week. Prerequisites: 207; and background in economics. Analysis of residential, commercial, and industrial real estate financial analysis, including elements of mortgage financing and taxation. The course will apply the standard tools of financial analysis to specialized real estate financing circumstances and real estate evaluation. (SP)

284. 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 areas, including real estate market behavior, real estate taxation, mortgage market developments, equity investment, valuation, and zoning. (SP)

285. International Finance. (3) Two 1-hour lectures per week. Prerequisites: 207. This course introduces students to the institutions and operation of the international financial system. Special attention is paid to international financial arrangements relevant for managers of multinational corporations. Topics include: foreign exchange and capital markets; the balance of payments; open economy macroeconomics; exchange rate determination; history of the international financial system; arbitrage and hedging; international aspects of financial decisions. (F,SP)

286. International Operations Management. (3) 288 is a one-semester substitute for 285 and 286. Four hours of lecture per week for seven and one half weeks. Prerequisites: All core courses. A summary of management problems unique to international operations, including strategic planning, organization, accounting, tax planning, financial management, and especially marketing, supplemented with cases. (F,SP)

287. Theory and Institutions of International Trade. (2) Four hours of lecture per week for seven and one half weeks. Prerequisites: 201A. The purpose of this course is to introduce students to the theoretical, empirical, and institutional factors shaping patterns of international trade. Topics include: theories of international trade; analysis of tariffs, protection, and commercial policy; international cartels; economies in international trade. (F,SP)

288. Survey of International Business. (3) Students may not receive credit for 288 and 285 or 286. Two 1-hour lectures per week. Prerequisites: All core courses or equivalent. A one semester combination of 285 or 286 and 288. Students who wish to take one course in international business. Both micro and macro aspects of international business are covered. (F)

289. Seminar in International Business. (3) May be repeated for credit. Two 1-hour seminars per week. Prerequisites: 207. Seminar topics will be devoted to highly topical subjects in the international business field. The subject of the seminar generally varies from semester to semester. (SP)

290. Strategic Planning: Models and Decisions. (3) Three hours of lecture per week. Concepts of strategy and decision-making are developed. The methods of planning models and techniques are evaluated for strategic policy choices, organizational design, and the allocation of resources. (SP)

292A. Research and Theory in Business: Economic Analysis and Management Science. (3) Two 1-hour lectures per week. Prerequisites: Ph.D. student or consent of instructor; previous work in statistics and probability theory. The focus of this course is to define a research problem and designing and employing specialized techniques to solve the problem. Topics will include concepts of causality, analysis of variance; experimental design; survey research; observational and multivariate, analytical techniques. (F)

292B. Research and Theory in Business: Behavioral Science. (3) Two 1-hour lectures per week. Prerequisites: Ph.D. student or consent of instructor; previous work in statistics and probability theory. The focus of this course is to define a research problem and designing and employing specialized techniques to solve the problem. Topics will include concepts of causality, analysis of variance; experimental design; survey research; observational and multivariate, analytical techniques. (F)

292C. Research and Theory in Business: Applied Econometric Methods. (2) Course may be repeated for credit. One 2-hour lecture per week. Prerequisites: Ph.D. student, Economics 241A, 241B, 241C, Agricultural Economics 211, 212, Business Administration 213, 214; consent of instructor. This course will review, critique and apply the more specialized econometric techniques found in the behavioral science literature. It will also give students first-hand experience in applying the behavioral science techniques to their research 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. One 2-hour lecture per week. Prerequisites: Ph.D. student, Economics 241A, 241B, 241C, Agricultural Economics 211, 212, Business Administration 213, 214; consent of instructor. This course will review, critique and apply the more specialized econometric techniques found in the behavioral science literature. It will also give students first-hand experience in applying the behavioral science techniques to their research problems. Course content will vary from year to year. Term paper will be a first pass at the statistical work in a student's dissertation preparation. (F)

292E. Research And Theory in Business: Stochastic Modeling. (2) Course may be repeated for credit. One 2-hour lecture per week. Prerequisites: Ph.D. student, 292A or equivalent; one graduate level course in statistics or econometrics. This course will review, critique, and apply statistical techniques found in the behavioral science literature. It will also give students first-hand experience in applying the behavioral science techniques to their research problems. Course content will vary from year to year. Term paper will be a first pass at the statistical work in a student's dissertation preparation. (F)

293. Individually Supervised Study for Graduate Students. (1-9) May be repeated for credit. One 2-hour lecture per week. Prerequisites: Ph.D student, 292A or equivalent; Stat 200A or equivalent; consent of instructor. Students will abstract and develop stochastic models of specified problem descriptions. Assignments will be followed by the reviewing and critiquing of the state-of-the-art paper(s) addressing these problems. Topics determined by the research interests of students. Term paper will be a first pass at stochastic modeling to be used as part of student's dissertation proposal. (F)
ular schedule, approved by faculty adviser as appropriate for the student's program. (F,SP)

294B. Philosophy of Systems Management. (3) May be repeated for credit. Two hours of lecture and 1½ hours of discussion per week. The concept of social systems improvement by means of inquiry (management, science, operations research, planning, etc.). An emphasis is placed on the basic philosophical issues involved in the evaluation of system performance. (F)

295A. Entrepreneurship and Business Development. (4) Four hours of lecture per week. Prerequisites: All core courses or equivalents. Guest lecturers discuss various aspects of starting, operating, and expanding the owner-managed business. Each student prepares a business plan for a new company for which financing is sought. The integration of financial plans, marketing, accounting, and organizational problems in a well-written proposal for financing is emphasized. (F)

295B. Entrepreneurship and Business Development. (2) Two hours of lecture per week. Prerequisites: All core courses or equivalents. Guest lecturers discuss various aspects of starting, operating, and expanding the owner-managed business. The integration of financial planning, marketing, accounting, and organizational problems in a well-written proposal for financing is emphasized. (F)

296. Special Topics in Business Administration. (1-3) May be repeated for credit. One, two or three hours of lecture per week. Prerequisites: Graduate standing. 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)

296. Research Seminar in Business Administration. (2-4) One hour discussion and two hours of seminar per week for 4 units or meet alternate weeks for 2 unit. Prerequisites: Admission to Ph.D. program in Business Administration and consent of instructor. A series of seminars at which current research on business administration topics is presented. The theme of a section can be based on the literature of an existing business administration field or on a topic that spans more than one field. Students will attend a one-hour seminar discussion at which the paper to be presented next will be discussed. (F,SP)

299. Individual Research in Business Problems. (1-12) May be repeated for credit. Individual conferences with Ph.D. students, S/U grading. Prerequisites: Graduate standing and consent of instructor. (F,SP)

601. Individual Study for Master's Students. (1-5) Units may not be used to satisfy unit or residence requirements toward a master's degree. Must be taken on a satisfactory/un satisfactory basis. Prerequisites: Graduate standing. Individual study for the comprehensive requirements in consultation with field adviser. (F,SP)

602. Individual Study for Doctoral Students. (1-8) May not be used to satisfy unit or residence requirements for the doctoral degree. May be repeated for credit up to 15 units. Must be taken on a satisfactory/un satisfactory 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. degree. (F,SP)

Interdepartmental Studies Courses

Upper Division Course

IDS 170. Economics of Organization. (3) Two 1½-hour lectures per week. Prerequisites: 100 or 101; or BA 110 or equivalent; or consent of instructor. This course presents economic concepts which explain why firms are vertically integrated, and why there are limits to the growth of firms. Other forms of economic organization, such as the partnership, the labor-managed firms, and cooperative ventures will also be considered. Sponsoring departments: Economics and Business Administration. (SP)

Graduate Courses

*IDS 294. Management of Technology Joint Learning Seminar. (3) One hour lecture and three hours unscheduled laboratory per week. Prerequisites: Business Administration 296 or Engineering 296 or 297, or consent of instructor. Students, under the guidance of two faculty advisors (Bus. Adm. & 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 the technology management process. Comprehensive report and presentation required. Sponsoring departments: Engineering and Business Administration.

*IDS 296. Management of Innovation and Policy. (3) Two 1½-hour lectures 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.

Related Courses in the Program in Public and Nonprofit Management

IDS 205. Advanced Seminar in Public and Nonprofit Management. (3)
IDS 207. Managers and Management. (3)
IDS 208. Techniques of Management Control. (3)
IDS 209. Applied Microeconomics. (3)
IDS 210. Organizational Understanding for Managers. (3)
IDS 211. Public Sector Accounting. (3)
IDS 212. Financial Management. (3)
IDS 214. Strategic Management in the Public Sector. (3)
IDS 217. Technology, Tasks, and Politics. (3)
IDS 218. Information Resource Management. (3)
IDS 219. Financing Tools for Public Managers. (3)
IDS 220. Management Professionals in Organizations. (3)

For information about these and other courses related to this program, see the Public and Nonprofit Management section of this catalog.

Celtic Studies

(College of Letters and Science)

Group Major: Office of Undergraduate and Interdisciplinary Studies, 301 Campbell Hall, 842-8684
Dean: Dean A. McKaule, Plus
Faculty Advisory Committee: Brendan O Hehir, chair (English), Gary Holland (Linguistics); Joan Keesey (Celtic Studies), Kathryn Klar (Celtic Studies), Daniel Mela (Rhetoric), Annarale Rejhan (Celtic Studies), Blake Spahr (German), Eve Sweetser (Linguistics), Robert Tracy (English).

Major in Celtic Studies

The program in Celtic Studies is designed to give students both a broad understanding of the place of Celtic languages and cultures in the world and a firm grounding in one or more of the Celtic languages. In addition to at least four semesters of language study, the other major requirements may apply for Credit by Examination.

Honors Program

In order for students to graduate with honors in Celtic studies, they must have achieved an overall grade-point average of 3.3 or higher in all work completed in the University, a minimum 3.5 grade-point average in all courses required for the major, and they must have taken both Celtic Studies 128 and 129 (one of the two is required for the major). A thesis is also required, which should normally emanate from H195, the Honors Seminar.

Minor in Celtic Studies

Students in the College of Letters and Science may complete one or more minors of their choice, normally in a field both academically and administratively distinct from their major.

Upper Division: Celtic Studies 70.

Lower Division: Five upper division courses chosen from the minor list and approved by the major adviser. All upper division courses applied to the minor must be completed on a letter-graded basis; at least three of the five courses must be completed at Berkeley, and a minimum overall grade-point average of 2.0 is required in the upper division courses applied to the minor.

Students interested in the minor should consult staff in Undergraduate Interdisciplinary Studies, 301 Campbell Hall, or Professor Eve Sweetser, Department of Linguistics, 2404 Dwinelle Hall, or Professor Gary Holland, Department of Linguistics.

Graduate Studies

Although no graduate degrees in Celtic are offered at present, it is possible to pursue research in Celtic languages, literatures, linguistics, folklore, etc., in a variety of departments. Dissertations on Celtic subjects have been accepted in the departments of Comparative Literature, History, Rhetoric, English, French, and Anthropology and in the program in Folklore.

Lower Division Courses

5A. Beginning Modern Irish. (3) Three hours of lecture and three hours of laboratory per week. Introduction to spoken and written Irish. Focus will be on pronunciation, simple sentence structure and grammatical exposition. Translation of straightforward En

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall
*On leave, spring
glieh constructions will follow, and as soon as possible, the reading and translating of some contemporary Irish writing. No previous knowledge of the language required. (F,SP) Keefe

5B. Beginning Modern Irish. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 5A and 5B. This 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. (F) Melia or Holland

105A. Old and Middle Irish. (4) Three hour lectures per week. Prerequisites: 5A and 5B or instructor's permission. A detailed introduction to the orthography, phonology, and grammar of Old Irish designed to provide the student with the substantial capacity to read with comprehension and to translate (either of dictionary or glossary) any edited text in Old Irish or Middle Irish. (SP) O Hehir, Melia or Holland

105B. Readings in Old and Middle Irish. (4) Course may be repeated for credit. Three hour lectures or two to three one-hour sections per week. Prerequisites: Successful completion of Celtic Studies 105A or equivalent. Designed to offer students who have completed the basic grammar course in Old and Middle Irish (105A) the opportunity to work with important texts written in the period A.D. 700-1200 and to refine their knowledge of 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. Special attention will be paid to the linguistic features. (SP) Keefe

105C. Readings in Modern Irish Literature. (4) One 3-hour reading and discussion per week. Prerequisites: 5A, 5B, 15, 105A, 105B, or equivalent, and/or instructor permission. Reading of extensive texts, prose, and poetry, in Modern Irish written from 1750 to the present. Lectures and discussion to be conducted in Modern Irish. Periodic written critiques in Modern Irish will be required. (F,SP) Keefe

106A. Middle Welsh Language and Literature. (4) Three hours lecture and one 1-hour discussion per week. Formerly Comparative Literature 1134. Middle Welsh pronunciation, grammar, and vocabulary studied in conjunction with the reading of Middle Welsh prose and poetic texts including the Mabinogi. (F) Klar or Rejphon

106B. Reading in Middle Welsh. (4) Three 1-hour lectures and one 1-hour discussion per week. Prerequisites: 106A. Formerly Comparative Literature 1135. Advanced instruction in Middle Welsh language, which will be read in conjunction with original prose and poetic texts with emphasis on poetry. (SP) Klar or Rejphon

128. Medieval Celtic Society: History of Ireland to 1500. (4) Three 1-hour lectures per week. A history of Ireland from pre-historical times to the beginning of the Tudor regime, focusing on the archaeological records of pre-Celtic cultures, the introduction of Christianity in the Fifth Century, the Viking and Anglo-Norman invasions, and the waning and waning of English dominance. (F) Melia or O Hehir

129. Modern Celtic Cultures and Folklore. (4) Course may be repeated for 1/2 credit under different instructor. Three 1-hour lectures 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 tribes will be examined; this course will concentrate on the major cultural and religious events of the modern period; the foundation of Brittany; the decline and suppression of modern Celtic languages. (SP) O Hehir

139. Irish Literature. (4) Three hours of lecture per week. Formerly English 106B. Gaelic literature 1000-1800 (in translation). Study of the prose saga-cycles, satire, classical literature, mythic poetry, and medieval epic poetry, developing the mythological and traditional background of modern Irish literature. (F) O Hehir

198. Directed Group Study. (1-4) Course may be repeated for credit. Group Conferences. Must be taken on a pass/fail basis. Prerequisites: 60 units and in good academic standing. Directed group study on special topics approved by Celtic Studies. Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Individual Conferences. Must be taken on a pass/fail basis. Prerequisites: 60 units and in good academic standing. Directed individual study on special topics approved by Celtic Studies. Staff
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 of process equipment. Students with high scholastic attainment are well prepared to enter graduate programs. The curriculum is accredited by the Accreditation Board for Engineering and Technology.

The requirements for the B.S. degree are: A total of 128 semester units; Mathematics 1A, 1B, 50A, calculus, three courses in humanities or social sciences, and one course in English composition. If a student who has successfully completed five upper division chemical engineering courses as follows: 140, 141, and 150A plus any two courses selected from 142, 150B, 152, 162, 170, 171, 173, 176, 178, and 179. Students who have completed courses in other departments at Berkeley that are essentially equivalent to 141 and 150A can substitute other courses from the above list. At least three upper division courses must be taken at Berkeley. All courses taken for the minor must be taken at a letter grade. Students must achieve at least a 2.0 grade-point average in the courses taken for the minor.

Graduate Programs

Students interested in graduate study are invited to write to the Department of Chemical Engineering for information.

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, 152, 162, 170, 171, 173, 176, 178, and 179. Students who have completed

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall

On leave, spring, fall
Recalled to active service
Recipient of Distinguished Teaching Award
178. Polymer Science and Technology. (3) Three hours of lecture per week; in 5 of the weeks 1-hour of lecture will be replaced with 3-hour lab. 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) Theodorou

179. Process Technology of Solid-State Materials. (3) Three hours of class meetings per week. Prerequisites: Engineering 45; one course in electronic circuits recommended; senior standing. Chemical engineering applications, processing and properties of solid-state materials. Crystal growth and purification. Thin film technology. Application of chemical processing to the manufacture of semiconductors and solid-state devices. (SP) Reimer

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 English proficiency as judged by a written examination. Development of technical writing and oral presentation skills in formats commonly used by chemical engineers. (F,SP) Plouffe, Sullivan

H194. Research for Advanced Undergraduates. (2-3) Course may be repeated for credit. Individual conferences. Prerequisites: Consent of instructor. Research under direction of one of the members of the staff. (F,SP) Staff

*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.

196. Special Laboratory Study. (2-3) Course may be repeated for credit. Individual conferences. Prerequisites: Consent of instructor. Special laboratory or computational work under direction of one of the members of the staff. (F,SP)

Graduate Courses

230. Mathematical Methods in Chemical Engineering. (3) Three hours of lecture per week. Prerequisites: Math 50A and 50B 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) Newman

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 not amenable to analytical solutions. Application of numerical techniques to chemical engineering calculations with emphasis on computer methods. (SP) Graves

240. Thermodynamics for Chemical Product and Process Design. (3) Three hours of lecture per week. Prerequisites: Math 50A-50B or equivalent; open to seniors with consent of instructor. First and second laws of thermodynamics, thermodynamic calculus. Criteria for thermodynamic equilibrium and 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) Pratsinis

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, catalysts, mass and heat transfer in chemical reactors. Performance of systems with chemical processes. Performance of systems with chemical reactors. (F) Petersen

245. Catalysis. (3) Three hours of lecture per week. Prerequisites: 244 or Chemistry 253, or consent of instructor. Adsorption and kinetics of surface reactions; catalyst preparation and characterization; potential factors influencing selectivity, and empirical activity patterns in catalysis; surface chemistry, catalytic mechanisms and modern experimental techniques in catalytic research; descriptive examples of industrial catalytic systems. (SP) Prausnitz

246. Principles of Electrochemical Engineering. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Electrode processes in electrolysis and in galvanic cells. Charge and mass transfer in ionic media. Criteria of scale-up. (SP) Newman

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 colloidal stability, kinetics of coagulation, and electrokinetics. (SP) Radke

249. Biochemical Engineering. (3) Three hours of lecture per week. Prerequisites: 150A, 150B; Molecular and Cell Biology 102; Chemistry 120B, 122E; or consent of instructor. Principles and applications of biochemical engineering and the laws underlying the prediction of equilibrium, reactions, and transport of momentum, heat, and mass in biological systems. (F) Newman

250. Transport Processes. (3) Three hours of lecture per week. Prerequisites: Math 220A and 220B or equivalent; open to seniors with consent of the instructor. Basic differential relations of mass, heat and momentum transport for Newtonian and non-Newtonian fluids; exact solutions of Navier-Stokes equations; scaling and singular perturbations; creeping flow; laminar boundary layers; turbulence; hydrodynamic stability. (SP) Blanch

251. Mass Transfer and Separations. (3) Three hours of lecture per week. Prerequisites: 250 or equivalent. Frames of reference in mass transfer analysis: 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) Chigier

256. Advanced Transport Phenomena. (3) Three hours of lecture per week. Prerequisites: 250. 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 flows complemented by treatments of turbulent flow systems and hydrodynamic stability.

257. Processing of Advanced Polymeric Materials. (3) Three hours of lecture per week. Prerequisites: 250A or equivalent; 178 or equivalent recommended. Rheological and fluid flow analysis for polymer processes including extrusion, calendering, fiber spinning, injection molding and mixing. Material design and process innovation for polymer applications in micro-electronics and optoelectronics. (SP) Muller

262. Computer Control of Chemical Processes. (3) Two hours of lecture and one 3-hour laboratory per week. Prerequisites: 172, Math 50A and 50B (linear algebra) or equivalent, or consent of instructor. Synthesis and implementation of digital control systems for complex continuous chemical process control. Development of modern control tools for process modeling and identification, multivariable and adaptive controls. Applications to distillation, combustion, heat exchange, and flow reactors.

263. Chemical Process Economics and Project Evaluation. (3) Three hours of lecture per week. Prerequisites: 160 or consent of instructor. Methods used by the chemical and petroleum industry to evaluate the commercial worth of processes using accepted economic, marketing, and managerial factors. Practice is offered through the medium of unstructured and open-ended projects involving group participation and individual efforts.

265. Design and Engineering of Integrated Chemical Process Systems. (3) Three hours of lecture per week. Prerequisites: A comprehensive background in chemical engineering. Consideration of specific, realistic cases involving the synthesis, evaluation, selection, and optimization of process alternatives. Qualitative and quantitative rationale, data for engineering judgment and economic evaluation. (SP) Lynn

295. Special Topics in Chemical Engineering. (2) Two hours of lecture per week. Prerequisites: Open to properly qualified graduate students. Current and advanced study in chemical engineering, primarily for advanced graduate students.

295B. Electrochemical, Hydrodynamic, and Interfacial Phenomena. (2) May be repeated for credit. (F) Newman

295C. Applied Molecular Theory for Chemical Engineers. (3) Three hours of lecture and one hour of discussion per week. 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, nonequilibrium statistical mechanics, transition state theory, and molecular simulations are developed and then applied to a wide range of problems.

295D. Engineering Principles of Emerging Biotechnologies. (2) Two hours of lecture per week. Prerequisites: 295C. This course will emphasize the fundamental principles that underlie several new technologies within biochemical engineering. Topics to be covered include protein engineering, enzyme and cell immobilization, drug delivery, membrane processes, biosensors, and mathematical models. State-of-the-art developments in these areas will be examined through review of the current literature.

295J. The Solid State. (2) May be repeated for credit. The course will be a survey of the electronic structure and properties of solids. Considerable time will be spent on the prediction of electronic structure and properties from empirical parameters.

295M. Applied Molecular Theory for Chemical Engineers. (3) Three hours of lecture and one hour of discussion per week. 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. (SP) Muller

2950. Chemical Engineering Management. (2) One 2-hour lecture per week. 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 (1) of what is expected of a new engineer in industry, (2) of the various challenges in (3) of the skills needed for success. (SP) Grossberg

295R. Spectroscopy for Chemical Engineers. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. This course will review the quantum mechanical principles of spectroscopy, the interaction of light with matter, and the application of various spectroscopies to problems in chemical engineering research.
295V. The Finite Element Method in Fluid Mechanics. (2) One 2-hour lecture per week. Prerequisites: Graduate standing, or consent of instructor. This course is an introduction to the numerical solution of fluid mechanics problems by means of the finite element method. Topics will include: finite element methods for non-linear and time-dependent problems, approaches to the solution of the incompressible Navier-Stokes equations, free and moving boundary flows, computer-aided stability and bifurcation analysis, and recent developments in the finite element modeling of viscoelastic memory fluids.

295S. Mass Transfer. (2) Two hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Fundamental principles of mass transfer with application to design of mass transfer processes. Theory of diffusion in gases and liquids for single and multicomponent systems. Mass transfer in laminar and turbulent flows. Transport analogies, simultaneous heat and mass transfer. Mass transfer with chemical reaction. Interfacial mass transfer and mass transfer in two-phase flows. Design of packed beds and columns, gas sparged reactors.

295S. Special Study for Graduate Students in Chemical Engineering. (1-6) May be repeated for credit. Individual conferences. May not be used for unit or residence requirements. Prerequisites: Consent of instructor. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Open to graduate standing, appointment as a Graduate Student in Chemical Engineering. May be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Special laboratory and theoretical studies. (F,SP)

295V. Seminar in Chemical Engineering. (1) May be repeated for credit. Variable— from one to two hours per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of major field adviser for qualified students. Lectures, reports, and discussions on current research in chemical engineering. Sections are operated independently and directed toward different topics. (F,SP)

295V. Research in Chemical Engineering. (1-12) May be repeated for credit. Individual conferences. Sections 1-29 must be taken on a satisfactory/unsatisfactory basis; section 30 must be taken on a letter grade basis. Prerequisites: Consent of Instructor. Research. (F,SP)

602. Individual Studies for Graduate Students. (1-8) May be repeated for credit. Individual conferences. Sections 1-29 must be taken on a satisfactory/unsatisfactory basis; section 30 must be taken on a letter grade basis. Prerequisites: Consent of Instructor. Research. (F,SP)

Professional Courses

300. Professional Preparation: Supervised Teaching of Chemical Engineering. (2) May be repeated for credit. Individual conferences and participation in teaching activities. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Ph.D. program. Individual study in consultation with the major field adviser for qualified students to prepare themselves for the various examination requirements of candidates for the Ph.D. (F,SP)

Chemistry

(College of Chemistry or College of Letters and Science)

Department Office: 419 Latimer Hall, 642-5882
Chair: William H. Miller, Ph.D.
Undergraduate Major Office: 420 Latimer Hall, 642-6473

University Professors:
Melvin Calvin, Ph.D. University of Minnesota. (Emeritus) Organic and physical chemistry
Glenn T. Seaborg, Ph.D. University of California at Berkeley. Physical chemistry (Nuclear)

Professors:
Richard A. Anderson, Ph.D. University of Wyoming. (Vice Chair) Inorganic and organometallic chemistry
Neil Bartlett, Ph.D. King's College, University of Durham. Inorganic and solid state chemistry
Paul A. Bartlett, Ph.D. University of Wisconsin. Inorganic chemistry
Robert G. Bergman, Ph.D. University of Wisconsin. Organometallic chemistry
Joseph Cerny, Ph.D. University of California at Berkeley. Nuclear chemistry
David Chandler, Ph.D. Harvard University. Theoretical chemistry
Charles B. Harris, Ph.D. Massachusetts Institute of Technology. Physical chemistry
Robert A. Lipton, Ph.D. University of Chicago. Theoretical chemistry
John E. Hearst, Ph.D. California Institute of Technology. Biophysical chemistry
Clayton H. Heathcock, Ph.D. University of Colorado. Organic chemistry
Darlene C. Hoffman, Ph.D. Iowa State University. Nuclear chemistry
William L. Jolly, Ph.D. University of California at Berkeley. Inorganic and physical chemistry
Sung-Hou Kim, Ph.D. University of Pittsburgh. Physical chemistry
Judith P. Kimman, Ph.D. University of Pennsylvania. Biochemistry and biophysical chemistry
Yun-Ti Lee, Ph.D. University of California at Berkeley. Physical chemistry
William A. Lester, Ph.D. Catholic University of America. Theoretical chemistry
Samuel S. Markowitz, Ph.D. Princeton University. Nuclear chemistry
Richard A. Mathies, Ph.D. Cornell University. Biophysical and physical chemistry
William H. Miller, Ph.D. Harvard University. Theoretical chemistry
C. Bradley Moore, Ph.D. University of California at Berkeley. Physical chemistry
Luciano G. Mott, Ph.D. University of Pavia. Nuclear chemistry
Rolle J. Myers, Ph.D. University of California at Berkeley. Physical chemistry
Norman W. Phillips, Ph.D. University of Chicago. Physical chemistry
*295V. The Finite Element Method in Fluid Mechanics. (2) May be repeated for credit. Consent of instructor. These courses permit the student to emphasize a particular field or subfield in areas of personal interest; or to specialize in some related field, such as physics, biology, geology, mathematics, metallurgy, materials science, ceramic engineering, nuclear science; or to complete the premedical requirements (Molecular and Cell Biology 102 and 131, for example). With the approval of the academic adviser these 15 units of advanced scientific courses and a portion of the 15 units of breadth electives (see below) can be used for coherent programs in other interdisciplinary areas.

The following requirements must also be satisfied: Subject A: American History and Institutions; American Cultures and Society; a reading knowledge of German equivalent to that provided by German 1 and 2; and a program of 15 units in English composition, humanities, and social sciences to fulfill the breadth requirement, for which a list of restrictions are provided by the College of Chemistry. See the Announcement of the College of Chemistry for additional information about the chemistry program.

Professional Courses

300. Professional Preparation: Supervised Teaching of Chemical Engineering. (2) May be repeated for credit. Individual conferences and participation in teaching activities. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Ph.D. program. Individual study in consultation with the major field adviser for qualified students to prepare themselves for the various examination requirements of candidates for the Ph.D. (F,SP)

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, and one of Physics 7A, 7B, 7C, Chemistry 1A, 1B, and 5 (or 4A, 4B); 104A, 104B, 112A, 112B or 112H, 120A, 120B, 125, and a choice of 105, 108, 115, or 143 plus IDS 145. For certification to the American Chemical Society, Chemistry 105 (or equivalent). In addition to the specified courses, the B.S. chemistry major consists of 15 units of advanced study in chemistry and related fields, including at least one course in chemistry. Total of 60 units of coursework, plus the College of Chemistry."
Field Major in Physical Sciences

Students interested in this major should see Physical Science 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 (8A-8B 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 for the minor and overall in the University.

Graduate Programs

Students interested in graduate study are invited to write to the chair of the Department of Chemistry, 419 Latimer Hall, for information.

Lower Division Courses

1A-1B. General Chemistry. (4,4) Students with credit in 4A and/or 4B may not receive credit for the corresponding semesters of 1A-1B. Two hours of lecture, one hour of discussion, and four hours of laboratory per week. Prerequisites: 1A: High school chemistry recommended. 1B: For nonmajors, 1A or Chemistry AP test score of 3, 4, or 5. For Chem. and Chem Engr. majors, 1A or 108 or Chemistry AP test score of 5. Stoichiometry, ideal gases, equilibrium, solubility (solubility, acids, and bases), thermochromic, nuclear chemistry, electrical cells, imperfect gases, atomic structure, valence bonding, periodic table, descriptive chemistry, transition metals, kinetics, introductory organic chemistry, qualitative analysis. Deficiency in 4A may be removed by successfully completing 1A-1B. (F,SP) Jolly; (Fall, SommerJay Stacy)

4A-4B. General Chemistry and Quantitative Analysis. (5,5) Students with credit in 1A and/or 1B may not receive credit for the corresponding semesters of 4A-4B. Three hours of lecture and five hours of laboratory per week. Prerequisites: High school chemistry within past 2 years (H.S. physics recommended), calculus (may be concurrent) and 710 or higher on CEEB Math Acc Test (level 1 or 2); scores 670-700 require instructor's approval. 4A-4B covers the principles of general chemistry with a more quantitative emphasis than 1A-1B and with considerably more depth. Laboratory emphasizes quantitative work and includes an independent project. This course is equivalent to 1A-1B plus 5 as prerequisite for further courses in chemistry. (F,SP) Mathies, Sauer

5. Quantitative Analysis. (3) Students with credit in 4A and 4B may not receive credit for 5. Two hours of lecture and four hours of laboratory per week. Prerequisites: 4B or 5; 104A (may be taken concurrently). Acid-base and complex formation equilibria and their applications to volumetric analytical methods. Principles and applications of spectrophotometry, potentiometry, coulometry, colorimetry, and ion exchange chromatography. Selected additional topics in instrumental analysis. (F,SP) Porter, Moretto

8A. Organic Chemistry with Biological Emphasis. (3) Students with credit in 112A may not receive credit for 8A. Deficiency in 112A cannot be removed by successfully completing 8A. Three hours of lecture and one hour of discussion per week. Prerequisites: 1B or 4B. For students not majoring in chemistry and not planning to take additional courses in organic chemistry beyond 8B. A study of nomenclature, reaction mechanisms and syntheses of major classes of organic compounds. Some aspects of electronic structure, reaction mechanisms and multistep syntheses are included but the treatment is less rigorous than 112A-112B. (F,SP) Kliman, Novak

8B. Organic Chemistry with Biological Emphasis. (4) Courses 112B, 112E, and 112H will restrict credit if completed prior to 8B. Three hours of lecture, one 1-hour laboratory lecture, and three hours of laboratory per week. Prerequisites: 8A. For students majoring in chemistry and not planning to take additional courses in organic chemistry. This course explores more complex compounds with particular reference to natural products and substances of biological importance. Deficiency in 112B, 112E, or 112H cannot be removed by successfully completing 8B. (F,SP) Vollhardt

14. Chemical Thermodynamics. (3) 104A, 120B, 130A, and 130AL will restrict credit if completed prior to 14A. Two hours of lecture and one hour of discussion per week. Prerequisites: 1B or 4B; Mathematics IB; Physics 7B (may be taken concurrently). Introduction to chemical thermodynamics: fundamental, collective properties and chemical equilibria.

9B. Introduction to Research and Study in the College of Chemistry. (1) One of seminar or paper work. Must be passed on a pass/fail basis. Prerequisites: For Chemistry majors. Introduces entering freshmen to research activities in the College of Chemistry and to the programs and facilities available. The course may be taken concurrently. Includes lectures by senior faculty, introduction to College computer facilities, the opportunity to meet faculty advisers and senior undergraduates in an informal atmosphere, and discussion of College and Campus resources. (F) Lynn

Upper Division Courses

104A-104B. Advanced Inorganic Chemistry. (3,3) Two hours of lecture and two 4-hour laboratories per week. Prerequisites: 104A (may be taken concurrently). Instrumental analysis. Principles and applications of electrochemical and spectrometric methods, including atomic absorption, fluorescence, controlled potential electrolysis, and spectroscopic techniques. Discussion of x-ray fluorescence, flame photometry, analytical separation methods, and other selected instrumental topics. (F) Madix

105. Inorganic Synthesis and Reactions. (4) Two hours of lecture and two 4-hour laboratories per week. Prerequisites: 4B or 5; 104A, 104B (may be taken concurrently). The 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. (SP) Arnold

112A-112B. Organic Chemistry. (5,5) 8A, 8B, 112A, and 112H will restrict credit if completed prior to 112A-112B. Three hours of lecture, one hour of laboratory per week. Prerequisites: 1B or 4B with a grade of C- or higher. For students majoring in chemistry or a closely related field such as chemical engineering or molecular and cell biology. A study of the fundamental organic chemistry, and physical properties, reactions and syntheses of the major classes or organic compounds. The study includes theoretical aspects, reaction mechanisms, multistep syntheses and the study of natural products and substances of biological importance. (SP) Hawkins, Shultz

112E. Organic Chemistry; Lecture Only. (3) Students with credit in 8B, 112B, or 112H may not receive credit. Three hours of lecture per week. Prerequisites: 112A, with grade of C- or higher, taken at UC Berkeley. Equivalent to lecture portion of 112B. (SP) Pedersen

112H. Organic Chemistry with Honors Laboratory. (3,5) 8B, 112A, and 112E will restrict credit if completed prior to 112H. Must attend 112H and complete 112A-112B. Three hours of laboratory per week, and four hours of laboratory per week. Prerequisites: Completion of 112A with high standing and consent of Instructor. Provides laboratory experience in advanced multidisciplinary instrumental techniques and spectroscopic and chromatographic techniques as preparation for research. This special laboratory section is more intensive and time-consuming than the regular laboratory section and involves greater individuality. It is especially recommended for Chemistry majors. (SP) Pedersen

113. Advanced Organic Chemistry. (3) Three hours of lecture per week. Prerequisites: 112B and 120A. Study of advanced topics of organic chemistry including linear free energy relations, orbital symmetry, mechanisms and complex synthesis, including heterocyclic systems. (SP) Streitwieser

115. Organic Chemistry—Advanced Laboratory Methods. (4) One hour of lecture and eleven hours of laboratory per week. Prerequisites: 112A; a reading knowledge of German or consent of instructor. Advanced synthetic methods, chemical and spectroscopic structural methods, designed as a preparation for experimental research. (F) Pedersen

120A. Physical Chemistry. (3) Courses 130B will restrict credit if completed prior to 120A. Three hours of lecture per week. Prerequisites: 1B or 4B, Math 1B, Physics (which may be concurrent). Three hours of lecture and four hours of laboratory per week. Prerequisites: 130A and 130AL are recommended. Quantum mechanics and spectroscopy of atoms and molecules with application to large molecular systems and solids. (F,SP) Chandler, Lester

120B. Physical Chemistry. (3) Courses 14A, 130A, 130AL, and 130BL will restrict credit if completed prior to 120B. Three hours of lecture per week. Prerequisites: 120A with a grade of C- or higher. Thermodynamics, statistical mechanics and kinetics with application to complex chemical systems. (F,SP) Myers, Whaley

122. Quantum Mechanics and Spectroscopy. (3) Three hours of lecture per week. Prerequisites: 120B. Postulates and methods of quantum mechanics and group theory applied to molecular structure and spectra. (SP) Neumark

124. Applied Chemical Thermodynamics. (3) Three hours of lecture and combustion per week. Prerequisites: 120B or 130A or Chemistry 141 or equivalent. Formerly IDS 124. Properties of real fluids and their mixtures. Phase equilibria and chemical equilibria for a variety of systems including electrolytes and polyatomic molecules. Additional topics (instructor) may include, for example, solid solutions, adsorption, chromatography, ion exchange and proper-
Chemical Applications of Group Theory. (3) Three hours of lecture per week. Prerequisites: 120B and at least one of 105, 108 or 115; consent of instructor and adviser. Special laboratory work for advanced undergraduates. (F,SP)

196. Special Laboratory Study. (2-4) Course may be repeated for credit. Nonlaboratory study may be counted toward a pass/fail basis. Enrollment is restricted by regulations listed in the General Catalog. (F,SP)

Graduate Courses

200. Advanced Topics in Inorganic Chemistry. (3) Three hours of lecture per week. Prerequisites: 203A or equivalent. Either 204A or 204B may be counted toward a pass/fail basis. (F,SP) Anderson, Armstrong

203. Chemical Applications of Group Theory. (3) Three hours of lecture per week. Prerequisites: Backlund in the use of matrices and linear algebra. The symmetry of molecules and ions; the application of group theory in molecular structure determination, chemical bond theory and spectroscopy for inorganic materials as molecular species and in crystal lattices. (F,SP) Alvarado

204A-204C. Advanced Topics in Inorganic Chemistry. (3,3,3) Three hours of lecture per week. Prerequisites: 204A: 104B, 120A-120B, 125, 203; or equivalent. 204B and 204C: 204A or consent of instructor. Current techniques and theory in inorganic chemistry including discussion of the structure, bonding, and reactivities of inorganic compounds. Emphasis on organometallic chemistry; 204C emphasizes solid state chemistry. 204B and 204C will be offered in alternate years. (F,SP) Anderson, Armstrong

205. Structure Analysis by X-Ray Diffraction. (3) Two one-hour lectures and two four-laboratory periods per week, must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. The theory and practice of modern, single-crystal X-ray diffraction. Groups of four students each determine the crystal and molecular structure of newly synthesized materials from the College of Chemistry. The laboratory work involves the mounting of crystals and initial evaluation by X-ray methods, the collection of intensity data by automated diffractometer procedures, and structure analysis and refinement. (SP) Raymond 210A. Physical Organic Chemistry. (3) Three hours of lecture per week. Prerequisites: 112, 120, or consent of instructor. Concepts and mechanisms of organometallic chemical reactions. (SP) Bergman

210B. Physical Organic Chemistry. (2) Two hours lecture and one hour of discussion per week. Prerequisites: 210A or consent of instructor. Organometallic reaction mechanisms, molecular orbital theory. (SP) Hawkins

211A. Synthetic Organic Chemistry. (3) Three 1-hour lectures per week. Prerequisites: 120B, 210A must be taken concurrently. Prerequisites: Consent of instructor. Application of stereochemistry and conformational analysis to organic chemical synthesis; synthesis of carbonyl-containing compounds and related reactions. (F,SP) Bednarski, Heathcock

211B. Synthetic Organic Chemistry. (2) Two 1-hour lectures per week. Prerequisites: 211A or consent of the instructor. Application of organic condensation reactions and organometallic reagents to organic synthesis. Oxidation and reduction reactions, modern synthetic methods. (F,SP) Hawkins

*213. Introduction to Organic Research. (2) Three hours of lecture per week and laboratory to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 210B or may be taken concurrently. Prerequisites: Consent of instructor. Introduction to organic research with emphasis on NMR and mass spectroscopy. (F,SP) Dawson

220B. Thermodynamics and Statistical Mechanics. (3) Three 1-hour lectures per week. Prerequisites: 120B, A rigorous treatment of classical thermodynamics followed by an introduction to statistical thermodynamics with the application to real systems. (F,SP) Dawson

221A. Advanced Quantum Mechanics. (3) Three hours of lecture per week. Prerequisites: 120B and equivalent. In the use of matrices and linear algebra. The dependence of matter with radiation; scattering theory, molecular and nuclear quantum mechanics. (SP) Harris

221B. Advanced Quantum Mechanics. (3) Three hours of lecture per week. Prerequisites: 221A. Time dependence, interaction of matter with radiation, scattering theory. Molecular and nuclear quantum mechanics. (SP) Harris, Lester

223A. Chemical Kinetics. (3) Three hours of lecture per week. Prerequisites: 220A (may be taken concurrently). Deduction of mechanisms of complex reactions. Collision and transition state theory. Potential energy surfaces. Unimolecular reaction rate theory. Molecular beam scattering studies. (SP,SP) Lee


231. Advanced Biophysical Chemistry. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Topics dealing with structural and dynamic aspects of RNA, DNA, and proteins, and with bioenergetics, membrane organization, and membrane protein structure. Physical-chemical approaches to these topics will be emphasized. (F,SP) Kim

243. Advanced Nuclear Structure and Reactions. (3) Three hours of lecture per week. Prerequisites: 113 or equivalent and introductory quantum mechanics. Selected topics on nuclear structure and nuclear reactions. (SP) Rasmussen

250. Special Topics. (1-3) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. Lecture series on topics of current interest. Recently offered topics: Nuclear products synthesis, molecular dynamics, statistical mechanics, and organometallic reagents. (F,SP) Staff

266. Seminars for Graduate Students. (1-3) Course may be repeated for credit. Seminars. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. In addition to the weekly Graduate Research Conference and weekly seminars on topics of interest in biological, organic, physical, nuclear, and inorganic chemistry, there are group seminars on specific fields of research. Seminars will be announced at the beginning of each semester. (F,SP) Staff

267. Research for Graduate Students. (1-6) Course may be repeated for credit. Laboratory. Prerequisites: Graduate standing. The facilities of the laboratory. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and appointment as a Graduate Student Instructor. Discussion, curriculum development, class observation, and practice in teaching chemistry. (F,SP,SP) Staff

291. Undergraduate Chemistry Instruction. (2) Course may be repeated once for credit. One hour of lecture and 5 hours of laboratory per week. Must be taken on a pass/fail basis. (F,SP) Staff

292. Undergraduate Chemistry Laboratory. (2) Course may be repeated once for credit. Consent of instructor. Experiments in thermodynamics, kinetics, and reaction mechanisms. (F,SP) Staff

293. Research for Undergraduate Students. (1-8) Course may be repeated for credit. Independent study in a specific field of research. Seminars will be announced at the beginning of each semester. (F,SP) Staff

Interdepartmental Studies Courses

Upper Division Course

143. Chemical Applications of Group Theory. (3) Three hours of lecture per week. Prerequisites: 120B and at least one of 105, 108 or 115; consent of instructor and adviser. Special laboratory work for advanced undergraduates. (F,SP)

144. Physical Organic Chemistry. (3) Three 1-hour lectures per week. Prerequisites: 120B, 210A must be taken concurrently. Prerequisites: Consent of instructor. Application of organometallic reaction mechanisms, molecular orbital theory. (SP) Hawkins

243. Advanced Nuclear Structure and Reactions. (3) Three hours of lecture per week. Prerequisites: 113 or equivalent and introductory quantum mechanics. Selected topics on nuclear structure and nuclear reactions. (SP) Rasmussen

267. Research for Graduate Students. (1-6) Course may be repeated for credit. Laboratory. Prerequisites: Graduate standing. The facilities of the laboratory. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and appointment as a Graduate Student Instructor. Discussion, curriculum development, class observation, and practice in teaching chemistry. (F,SP,SP) Staff

267. Research for Graduate Students. (1-6) Course may be repeated for credit. Laboratory. Prerequisites: Graduate standing. The facilities of the laboratory. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and appointment as a Graduate Student Instructor. Discussion, curriculum development, class observation, and practice in teaching chemistry. (F,SP,SP) Staff

291. Undergraduate Chemistry Instruction. (2) Course may be repeated once for credit. One hour of lecture and 5 hours of laboratory per week. Must be taken on a pass/fail basis. (F,SP) Staff

292. Undergraduate Chemistry Laboratory. (2) Course may be repeated once for credit. Consent of instructor. Experiments in thermodynamics, kinetics, and reaction mechanisms. (F,SP) Staff

293. Research for Undergraduate Students. (1-8) Course may be repeated for credit. Independent study in a specific field of research. Seminars will be announced at the beginning of each semester. (F,SP) Staff

Interdepartmental Studies Courses

Upper Division Course

143. Chemical Methods in Nuclear Technology. (3) Three 1-hour lectures and one 1-hour laboratory per week. Prerequisites: Nuclear Engineering 101 or Chemistry 143. Experimental illustrations of the interrelation between chemical and nuclear science and technology; fission product, chemical effects of nuclear transformations; application of radioactivity to study of chemical problems; neutron activation analysis. Also listed as Chemistry 144 and Nuclear Engineering 106.

Chicano Studies (Special Studies or College of Letters and Science)

Program Office: 3404 Dwaine Hall, (415) 642-0240
Professor: Mario Barrera, Ph.D.
Associate Professors: Beatrice Manc, Ph.D., Margarita Melville, Ph.D., Carlos Munoz, Jr., Ph.D.

On leave, spring, fall
Recalled to active service
Recipient of Distinguished Teaching Award

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall
Choice of Program
A student can complete the major in Chicano Studies in the College of Letters and Science (A.B. degree) or in the Department of Ethnic Studies (A.B. degree). Students in each program are subject to the requirements of the respective college or department.

Chicano Studies Program Requirements
The Bachelor of Arts degree in Chicano Studies will be awarded upon fulfillment of the following requirements:
1. Completion of the general University requirements regarding senior residence, Subject A, American History and Institutions.
2. Completion of 120 units, at least 40 of which must be in upper division.
3. Maintenance of at least a C average in all courses undertaken at the University and a grade of C average in all courses in the major program.

Breadth Requirements—Special Studies
(for College of Letters and Science breadth requirements, consult the college announcement)
1. Demonstrate proficiency in Reading and Composition: Chicano Studies 1A and 1B or equivalents.
2. Completion of at least 6 units of courses in Ethnic Studies, American Studies or Native American Studies.
3. Completion of one course in quantitative methods (e.g., statistics, mathematics, computer science).

Major Requirements
Lower Division. 1. Completion of three core courses from Chicano Studies 20, 40, 50, 70 or 80.
2. Demonstration of proficiency in Chicano Spanish through completion of 6A and 6B, Chicano Spanish (or by passing a proficiency examination given at the beginning of each semester).
3. Completion of at least 6 units of courses (may include upper division) outside the Chicano Studies Department such as political science, social welfare, comparative literature, etc. (determined upon consultation with the Chicano Studies adviser).

Upper Division. 1. Completion of Chicano Studies 101.
2. Completion of five additional upper division courses in Chicano Studies. To include: (a) one course from 141, 142, 143, 150A, 150B, or 161; (b) two courses from 145, 155, 170, 172, 174, or 176; (c) one elective. It is recommended that majors take at least one upper division Chicano Studies course in Spanish.
3. One course in Ethnic Studies.
4. Four units of senior thesis work will be optional for all majors: 195.

Honors Program. The Chicano Studies Program provides a program leading to the A.B. degree with honors. A student must have junior standing; a 3.3 University GPA; and a 3.3 GPA in the major. The honors thesis will consist of a 6-unit research project. The faculty will establish criteria and grade the project. For more information, see the Chicano Studies adviser in 3410 Dwinelle.

The Minor in Chicano Studies
Required courses: Five upper division courses. (1) Chicano Studies 101. (2) One course from 141, 142, 143, 150A, 150B, or 161. (3) One course from 145, 155, 170, 172, 174, or 176. (4) Two Chicano Studies upper division electives.

Lower Division Courses
1A. English Reading and Composition for Native Speakers of Spanish. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Subject A. To acquaint Chicano and bilingual students with methods of expository discourse. An introduction to writing, beginning with sentence and paragraph structure, with an emphasis on unity, coherence, and organization of a full composition. (F,SP) Soto, Moraaga
1B. English Reading and Composition for Native Speakers of Spanish. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Subject A. Designed to acquaint bilingual students with the study of the research paper form of expository discourse. (F,SP) Soto, Moraaga
6A. Chicano Spanish. (4) Four hours of lecture per week. Designed and systematically structured to develop confidence in the Chicano student's ability to communicate effectively in Spanish through an emphasis on class discussions, weekly compositions, individual and group presentations, lectures, movies, and written assignments. Prerequisites: Consent of instructor. Individual research by lower division students. Limited to Freshmen and Sophomores. (F,SP)
6B. Chicano Spanish. (4) Four hours of lecture per week. Prerequisites: 6A. To expand upon the material and concepts covered in 6A. This course is designed to introduce the Chicano student to representative Spanish authors and to critical analyses of a variety of their writings. (F,SP) Parra
20. Introduction to Chicano Culture. (3) Three hours of lecture per week. An introduction to the cultural life of Chicanos emphasizing the period from 1900 to the present. A key theme will be the interaction between Chicano and American society as expressed in Chicano literature, music, art, and folklore. Attention will also be given to change and continuity in Chicano family life, gender roles and parent-child relations. (SP) Melville
99. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. To be arranged. (F) Barrera
98. Supervised Group Study and Research. (1-3) Course may be repeated for credit. To be arranged. (F,SP)
95. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Three to twelve hours of tutorial per week. Must be taken on a pass/fail basis. Prerequisites: Consent of Instructor. Individual research by lower division students. Limited to Freshmen and Sophomores. (F,SP)
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) Muñoz
135. The U.S. Latino Experience as Seen through Film. (3,4) One 3-hour lecture and one 2-hour optional laboratory per week. Prerequisites: Sophomore standing. A study of the experience of Latinos in the United States as reflected in the medium of film. The course includes documentary and feature films, both historical and contemporary. Students receive 3 credit hours for attendance at the lectures and doing class readings and written assignments. They receive 4 credit hours for additionally participating in a 2-hour weekly laboratory. This lab is optional. (F) Barrera
141. Chicana Writers. (3) Three hours of lecture per week. Prerequisites: 1A-1B or equivalent. An exploration and analysis of works written by Chicana writers and the vision they present of themselves. (F)
142. Major Chicano Authors. (3) Three hours of lecture per week. Prerequisites: 40 recommended. Critical analysis of the works of major Chicano poets, short story writers, and novelists. (SP)
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 con-
The student will also practice writing in the genre of Creative Writing. (5) Three hours of lecture and two hours of laboratory per week. Prerequisites: three hours of writing workshop per week. Pre-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. (3) Three hours of lecture per week. Prerequisites: 50 recommended. A history of Spanish-speaking people in the Southwest from the latter part of the eighteenth century to approximately 1860. This Spanish-speaking population of the Southwest will be discussed, but emphasis will be placed on the forces and events that led to the war between Mexico and the U.S. from 1845 to 1848. The aftermath of the war and its consequences for Spanish-speaking people will also be examined. (F) Saragoza

150B. History of the Southwest: Mexican-American Period. (3) Three hours of lecture per week. Prerequisites: 50 and/or 150A recommended. A history of Chicano from the late nineteenth century to the present. This historical experience will be given to Mexican political, economic and social forces and their impact on Chicano communities. Particular attention will be given to the internal dynamics of Chicano communities over time through the discussion of topics such as immigration, labor patterns, urbanization and cultural change, and the Chicano movement. (F) Saragoza

155. The Chicano Family, Sex Roles, and Children. (3) Three hours of lecture per week. Prerequisites: 50 and/or 145 recommended. An examination of the different forms of Chicano family life through a historical analysis, including Spanish, Indian and Mexican antecedents. Historical documents, literature, music and film will be utilized to trace the development of Chicano family life from pre-Spanish and pre-Mexican times to the present. (SP) Trujillo

161. Central American Peoples and Cultures. (3) Three 1-hour lectures. A comparative survey of the peoples and cultures of the seven countries of the Central American isthmus from a historical and contemporary perspective. (F) Manz

162. The U.S. Role in Central America. (3) Three hours of lecture and one hour discussion section per week. A critical examination of the role played by the United States in Central American and political and economic events from the 19th century to the present. The focus will be on trends in U.S. policy, including an assessment of current policy alternatives in Nicaragua, El Salvador, Guatemala, Honduras, and the impact of U.S. policies on Latinos in the United States. (SP) Manz

170. Chicanos and Political Change. (4) Three hours of lecture and one hour discussion per week. A critical examination of Mexican American social and political movements, organizations, ideologies, and leadership in the historical context of the political history of political change in the United States. (SP)

172. Chicanos and the Educational System. (3) Three hours of lecture per week. Prerequisites: 70 recommended. An examination of the historical and contemporary relationship between the educational system and the Mexican community in the United States; the history of schooling practices within the Mexican population as a backdrop to an examination of the current educational conditions of the Chicano students; the different historical trends in the education of Chicanos including alternative schools, bilingual education, school segregation, and higher education. (SP) Harmanéz

174. Chicanos, Law, and Criminal Justice. (3) Three hours of lecture per week. Prerequisites: 70 recommended. An examination of the development and function of law, the organization and administration of criminal justice, and their effects in the Chicano community; response to these institutions by Chicanos. (SP) Trujillo

176. Chicanos and Health Care. (3) Three hours of lecture per week. Prerequisites: 70 recommended. Relationship of the health care delivery system in the U.S. to the Chicano community. To include an examination and understanding of the concept of mental health as defined by Chicanos. Analysis of program alternatives and the Chicano response to health care problems and issues.

180. Topics in Chicano Studies. (3) May be repeated for credit. Three hours of lecture per week; limited enrollment course. Prerequisites: Consent of instructor. Designed primarily to permit instructors to deal with topics with which they are especially concerned; usually more restricted than the subject matter of a regular lecture course. (F,SP) Cervantes

190. Advanced Seminar in Chicano Studies. (3) May be repeated for credit. One 3-hour seminar per week. Prerequisites: Upper division standing, consent of instructor. Advanced seminar in Chicano Studies with topics to be announced at the beginning of each academic year. (SP) Cervantes

195. Senior Thesis. (4) By arrangement. Must be taken on a pass/no credit basis. Prerequisites: Consent of instructor. Writing of a thesis under the direction of the member(s) of the faculty. (F,SP)

H195A-H195B. Honors Thesis. (3,3) To be arranged. Credit and grade to be awarded upon completion of the program. Junior standing; a 3.3 University GPA and a 3.3 GPA in the major. Independent study and preparation of an honor thesis under the supervision of a faculty member. (F,SP)

197. Field Work in Chicano Studies. (1-3) May be repeated for credit. Individual arrangements. Must be taken on a pass/no credit basis. Prerequisites: Upper division standing; consent of instructor. Supervised independent field experience in the community relevant to specific aspects of Chicano Studies. Regular meetings with faculty sponsor and written reports are required. (F,SP)

198. Directed Group Study. (1-3) May be repeated for credit. Individual arrangements. Must be taken on a pass/no credit basis. Prerequisites: Upper division standing; consent of instructor. Directed group study in Chicano Studies for advanced students. Regular meetings with faculty sponsor and written reports are required. (F,SP)

199. Supervised Independent Study and Research. (1-4) May be repeated for credit. Individual arrangements. Must be taken on a pass/no credit basis. Prerequisites: Consent of instructor. Independent work for advanced students in Chicano Studies. Regular individual meetings with faculty sponsor and written reports are required. (F,SP)

City and Regional Planning

(Chile College of Environmental Design)

Department Office: 228 Wurster Hall, 642-3236
Chair: Edward Blakey, Ed.D.
Professors:
Edward Blakey, Ed.D. University of California at Los Angeles. Local economic development theory

Manuel Castells, LL.B., Ph.D. University of Paris at Sorbonne.

Stephen S. Cohen, Ph.D. London School of Economics.


Urban economics

Loraine N. Duh, M.D. Albany Medical College. Social programs and policy

Peter Hall, Ph.D. Cambridge University. Metropolitan planning

Ira Michael Heyman, LL.B. Yale Law School. Land use planning

Judith E. Innes, Ph.D. Massachusetts Institute of Technology. Social policy

Allan B. Jacobs, M.C.P. M.C.P. University of Pennsylvania. Urban design and planning

Roger Montgomery, M.Arch. Harvard University. Community development and housing

Michael T. Tietz, Ph.D. University of Pennsylvania. Urban economics and housing

Irene Tinker, Ph.D. London School of Economics.

Development planning

Donald L. Foley, Ph.D. (Emeritus) Washington University.

Metropolitan regional development

T. J. Kent, Jr., M.C.P. (Emeritus) Massachusetts Institute of Technology. Urban planning and design

Richard L. Meier, Ph.D. (Emeritus) University of California at Los Angeles. International urbanism

Charles C. Morley, B.S. (Emeritus) City College of the City of New York. Urban planning theory, social programs

Associate Professors:

Peter Bosselman, M.Arch. University of California at Los Angeles. Urban design, public communication

Robert B. Cervero, M.C.P. Georgia Institute of Technology. Ph.D. University of California at Los Angeles. Urban transportation

Frederick C. Collignon, Ph.D., A.I.C.P. Harvard University. Social policy, services planning

Gillian P. Hart, Ph.D. Community Development. Development planning, rural development, gender studies

Michael Southworth, Ph.D. Massachusetts Institute of Technology. Urban design, environmental psychology

Assistant Professors:

Elizabeth Deakin, M.S. Massachusetts Institute of Technology. Urban policy, transportation planning

John Landis, M.C.P., Ph.D. University of California at Berkeley. Housing, urban economics, public finance

Ann Lee Saxenian, M.C.P. University of California at Berkeley. Ph.D. Massachusetts Institute of Technology. Regional development, planning methodology

Lecturers:

Arthur Baustein, M.A. Columbia University. Urban planning, geographic information systems

Ted K. Bradshaw, Ph.D. University of California at Berkeley. Public organizations, economic development

Karen Christensen, Ph.D. University of California at Berkeley. Planning theory, housing

Frederick M. Etzel, M.C.P. City College of the City of New York. Planning Department of Berkeley, J.D. Hastings College of Law. Land use planning, law, social policy

John Tillman, M.L.A. University of California at Berkeley. Environmental planning, land use planning, historic preservation

The planning of cities is as old as urban civilization. The present-day planning profession has emerged in response to the rapidly changing character, and critical problems of urban development. Planning is an accepted function of government, both overall and in connection with particular programs, while planners are likewise employed by large scale private developers. Theoretists and researchers in other disciplines have become increasingly interested in urban problems, and their work, often in partnership with planners, is contributing to a greater knowledge and more sophisticated methods in planning practice. City and regional planning claims 21,000 professionals in the United States, 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 public development in their respective jurisdictions. City planners are also relied upon in other types of public agency—including local, state and federal agencies dealing with highways, transportation, housing, urban planning, 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 fields of urban and regional planning leading to the degree, Master of City Planning, which is a recognized degree within the Planning Accreditation Board accreditation system. The department also offers a Ph.D. degree in city and regional planning. Research areas include Landscape Architecture, and City Planning have established concurrent programs in Urban Design enabling students to take 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 Law, the School of Public Health, and the Transpor- tation Planning and Engineering School.

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 undergraduates and graduate students. For more detailed information about these curricula, consult the Announcement of the College of Environmental Design or the Department of City and Regional Planning.

Upper Division Courses

110. Introduction to City Planning. (3) Three hours of lecture and discussion per week. Prerequisites: Open to majors in all fields. Survey of city planning as it has evolved and developed since the late 19th century and its response to physical, social, and economic problems; major concepts and procedures used by city planners and local governments to improve the urban environment. (F,SP) Christensen, Deakin

111. Introduction to Housing: An Intematlonal Survey. (3) Three hours of course work by recording the completed semester's official transcript. Students may take these courses with departmental approval to retain the grades earned. A community development minor is open to all majors in all fields. Formerly 113. Introduction to Housing: An International Survey. Focus on national economic and social policies, role of local community economic development corporations (CDEs), resolution of conflicts between private-sector profit and public-sector (community) goals, stability or change through critical use of the planning process. (F) Blaustein

115. Urbanization in Developing Countries. (3) Three hours of lecture and discussion per week. Lectures will cover the following topics: development, urbanization, and international relations; process of rural-urban migration; urban marginality in the Third World; metropolitan policies; the case of transportation; the role of international agencies: the World Bank; Third World energy problems. (SP) Harris

116. Urban Planning Process. (3) Three hours of lecture and discussion per week. Prerequisites: Upper division standing; 110 or consent of instructor. An intermediate course in the planning process with practicum in using planning techniques. Lectures, readings, and problems. Prs. (F,SP) Trilling

117. Minorities and Gender in Planning. (3) Three hours of lecture and discussion per week. Formerly 191E. 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 will be explored. (SP) Staff

118. The Urban Community. (3) Three hours of lecture and discussion per week. Prerequisites: Upper division standing. Formerly 191E. 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 will be explored. (SP) Staff

197. Field Studies. (1-3) Course may be repeated for credit. Credit is based on each one-hour visit per unit. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor. Supervised experience in the study of off-campus organizations relevant to majors in city planning. Regular individual meetings with faculty sponsor and written report is required. (F,SP)

198. Special Group Study. (1-3) Course may be repeated for credit. Three hours of lecture and discussion per week. Must be taken on a pass/no pass basis. Group studies developed to meet specific needs of students. Enrollment restricted by regulations in the General Catalog. (F,SP)

199. Special Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Flexible, at discretion of the instructor. Must be taken on a pass/no pass basis. Consent of instructor. Regular meeting with faculty overseer. (F,SP)

Graduate Courses

200. History of City Planning. (3) Three hours of lecture and 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 planning practice and theory since the late 19th century; some comparative and earlier material. (F,SP) Innes

201. The Urban Planning Process. (3) Three hours of lecture and discussion per week. Prerequisites: Entry level master's students. An advanced survey of City and Regional Planning addressing history of planning, ethics, theories, politics, urban design and current practice. The course includes a series of lectures, discussion sessions and problem-solving exercises. (F) Inn

202. Economics of Public Enterprise. (3) Three hours of lecture and discussion per week. Prerequisites: 113 or Economics 100A or equivalent. Roles of governmental agencies as producers of urban services in normmarket setting; local public finance, taxation, and budgeting; measurement of benefits and costs; policies and procedures for investment decisions concerning types and qualities of services and facilities. Core-required course. (SP) Collignon, Staff

204. Analytic and Research Methods for Planners. Course may be repeated for credit as modules vary. Formerly 204A-204B, 205A. Three modules on research design strategies and analytic methods for planners. Each module will run for all or for a segment of a semester and will cover a cluster of methods. A student may take sequentially two or three modules in one semester.

204A. Introduction to Urban Planning Methods. (4) Four hours of lecture and discussion per week. Prerequisites: Introductory Statistics course or equivalent background. Introduction to the use of quantitative reasoning and statistical techniques to solve planning and policy problems. Course focuses on specific techniques of inferential statistics and sampling to planning problems; (ii) multivariate techniques such as chi-squared and linear regression; (iii) advanced multi-variate techniques such as multiple regression, logit analysis, and modelling. (F) Landis

204B. Research Methods for Planners. (3) Four hours of lecture and discussion per week for 10 weeks. Field research methods for planning problems: including observation, key informant interviewing, survey methods. Analysis of existing information: tables and graphs and computer mapping, and bibliographic skills. Research design, including problem formulation, conceptual modeling, quasi-experimental design for making infer-ences and writing a research proposal. (SP) Innes

204C. Survey Design and Analysis. (2) Two 1½ hour lectures plus 1 hour discussion per week, for 7½ weeks. Prerequisites: 204B. Students as a group will design, conduct and analyze a survey on a community planning issue. Topics include questionnaire writing, coding and formatting, sampling methods, survey administration methods, interviewing, survey analysis and presentation techniques. (SP) Innes, Staff

204D. Multivariate Analysis in Planning. (3) Four hours of lecture/discussion per week, for 10 weeks. Prerequisites: 204A or equivalent. Theory and application of advanced multivariate methods in planning. Emphasis on causal modeling. Topics include: multiple regression analysis; residual analysis; weighted least squares; non-linear models; path analysis; log-linear models; logit and probit analysis; principal components; factor and cluster analysis. Completion of two computer assignments, using several microcomputer statistical packages, is required.

204E. Forecasting and Time-Series Analysis in Planning. (3) Four hours of lecture/discussion per week for 10 weeks. Prerequisites: 204A or equivalent; 204D recommended. Longitudinal data analysis. Emphasis on building time series models for systematic and demographic forecasting. Topics include: autoregressive models; lagged equation structures; simultaneous equation models; single-equation modeling; smoothing and ARIMA analysis; population models, including cohort-survival methods; joint population-employment modeling. Com-pletion of two computer assignments, using microcomputer statistical packages, is required.

204F. Modelling and Measurement Methods. (2) Four hours of lecture/discussion per week. Half-course. Prerequisites: 204A, 204B, 204C, 204D or equivalent. Methods of conceptualizing and modelling policy problems for analysis and decision making. Concepts, principles and techniques of measurement for handling and measuring phenomena, data sources, design and application of indicators in planning and research. Em-
phasis on working through examples pertinent to environmental, social and economic issues.

205. Planning and the Legal Process. (3) Three hours of lecture/discussion per week. Introduction to the American legal process and legal framework within which planning and related problems are addressed. The course stresses legal methodology, the basics of legal research and the common-law decisional method. Statutory analysis, administrative law, and legal interpretation are also covered. Case topics focus on the law of planning, property rights, land use regulation and access to housing. (F) Etzel

206. City Planning Legislation and Governmental Organization. (3) Three hours of lecture and discussion per week. Prerequisites: Consent of Instructor. Downtown Los Angeles case study. The role of the city planning agency in municipal and metropolitan governments; major alternative definitions of city planning; relationship of long-range physical plan to urban development agencies; significance of city planning legislation in reorganization of local government. (F) Staff

*208. Citizen Involvement in the City Planning Process. (3) Three hours of lecture/seminar per week. An examination of the roles of the citizen and citizen organizations in the city planning process. Models for citizen involvement; programs for informing and organizing the community. Examination of the effectiveness of different organizational models in different situations. (SP) Staff

210. Introduction to Studio Laboratory: Plan Preparation. (4) Two hours of seminar and eight hours of studio per week. Prerequisites: City Planning students only. An introduction to the field experience in urban plan preparation, including the use of graphic communication techniques appropriate to city planning and involving individual and collaborative student-group efforts in formulating planning policies and programs for an urban area. (SP) Jacobs

211. Urban Land Economics. (3) Three hours of lecture and discussion per week. Prerequisites: 113 or Economics 100A or equivalent. Using microeconomics as its platform, course explores the process and pattern of land use and the decisions that lead to the development of an urban area. (F) Dowall

212. Land Use Controls. (3) Three hours of lecture/discussion per week. Prerequisites: 113 or Economics 100A 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. (SP) Deakin

213. Transportation and Land Use Planning. (3) Three hours of lecture and discussion per week. Prerequisites: 113 or Economics 100A or equivalent. Analysis of the urban, metropolitan, and regional economy for planning. Economic base and other macro models; impact analysis and projection of changing labor force; economic-demographic interaction; issues in growth, income distribution, planning controls; interregional growth and population distribution issues. (F) Saxenian

214. Urban and Regional Infrastructure. (3) Three hours of lecture per week. Prerequisites: 113 or equivalent. Urban and regional infrastructure planning and management of physical infrastructure systems: transportation, water supply, wastewater, storm water, solid waste management, community energy facilities, and urban public facilities. Environmental impacts of infrastructure development; centralized vs. decentralized systems. case studies. (SP) Staff

215. Planning and Analysis for Urban Development Projects. (3) Three hours of lecture and discussion per week. Prerequisites: 211 or equivalent. This course acquaints students with the techniques of project feasibility; analysis of project proposals and overall project compatibility assessment. Case studies will be based on a variety of public and private sector developments, in central city and suburban locations. (SP) Dowall

217. Urban Transportation Policy and Planning. (3) Three hours of lecture and discussion per week. Prerequisites: 213 or consent of instructor. Technological and political factors in urban transportation planning; examination of current transportation topics of policy impetus, e.g.: financial, pricing, and subsidy issues; transportation impacts on energy and environmental quality; transportation demand management; land use and travel demand; transit performance and productivity trends; public-transport and innovative services. (SP) Hall

218A-218B. Studio: Community General Plan and Development Studies. (4-4) Two hours of lecture or seminar and four hours of studio per week. Prerequisites: 210, 211, and at least one studio. Seminar explores the process and pattern of plan preparation, through case study examinations. (F,SP) Landis, Cornett, Staff

219. Advanced Seminar on Land Use and General Plan Topics. (3) Course may be repeated for credit. Three hours of seminar meetings per week. Prerequisites: 206, 212, and at least one studio. Seminar examines current environmental issues confronting California communities, with topics varying from year to year. Efforts to develop remedies are made; student papers are required. (SP) Deakin

220. The Urban and Regional Economy. (3) Three hours of lecture and discussion per week. Prerequisites: 113 or Economics 100A-100B or equivalent. Analysis of the urban, metropolitan, and regional economy for planning. Economic base and other macro models; impact analysis and projection of changing labor force; economic-demographic interaction; issues in growth, income distribution, planning controls; interregional growth and population distribution issues. (F) Saxenian

221. Rural Area and Small Town Planning and Policy. (3) One 3-hour seminar per week; one field session. Prerequisites: Graduate standing. This seminar focuses on the role of rural places and small towns in the national economy. It will examine the contemporary, social, political and particularly economic issues that face these areas. Participants will examine policy and plan concepts, means of planning, design, and implementation of plans. Students will work on their projects. (SP) Blakely

222. Economic Development Planning. (3) Three hours of lecture and discussion per week. Prerequisites: 113 or Economics 100A or equivalent; Calculus. Density and interactional approaches to analysis of spatial distribution; ecological descriptive theories and economic behavioral theories of location and spatial structure. Introduction to models of residential and industrial location; governmental influences on spatial distribution of urban activities. (F) Teitz

*224. Location Theory and Spatial Interaction Models. (2) Two hours of lectures per week. Prerequisites: Economics 100A or equivalent. Calculus. Density and interactional approaches to analysis of spatial distribution; ecological descriptive theories and economic behavioral theories of location and spatial structure. Introduction to models of residential and industrial location; governmental influences on spatial distribution of urban activities.

225. Advanced Methods of Urban and Regional Analysis. (1-3) Three hours of lectures per week module. Prerequisites: 204A-204B, 220 or 231 or 215. Covers recent advances in location theory and analysis, shift share techniques, input-output analysis, linear programming, regional econometric models, and qualitative sectoral studies. In some semesters, optional 5-credit assignment; 10 weeks. This course is a required module for students at semester. (SP) Staff

227. Studies in Regional Growth and Development. (3) Three hours of seminar sessions per week. Prerequisites: 220. Intermediate to advanced course focusing on theory and empirical evidence for regional growth and development, using reading and discussion, requiring short paper applying material to a region of the student's choice. (F) Saxenian

*228. Workshop Studio in Metropolitan and Regional Planning. (4) Two hours of seminar and four hours of field work per week. Prerequisites: Consent of instructor. Relevant past coursework and consent of instructor. Field problem in major phases of metropolitan or regional planning work. A collaborative student-group effort in formulating regional plans or planning recommendations within specific governmental framework.

229. Research Seminar in Regional Development. (3) Course may be repeated for credit. Three hours of seminar meetings per week. Prerequisites: 220 and consent of instructor. A close examination of selected topics in regional or metropolitan development, through student/faculty research papers and class discussion. Designed primarily for Ph.D. students and Master's students writing professional theses. (SP) Landis, Teitz

230. Housing Markets and Planning. (3) Three hours of lectures and discussion per week. Prerequisites: 213 or an introductory course in micro-economics. Theory of housing markets and empirical methods for measuring market conditions and performance; housing consumption, housing supply and production, and market performance. Empirical analysis and applications to policy issues. (SP) Landis, Teitz

231. Housing Finance and Policy. (3) Three hours of lectures and discussion per week. Prerequisites: 213 or equivalent and 210 and consent of instructor. Analysis of housing policy and programs at the local, state, and federal levels, emphasizing program design as well as methods and institutions of housing finance. Topics covered include mortgage structuring, operations of Fannie and Freddie, social insurance, forms of ownership, federal subsidy programs, tax subsidies, and the use of tax-exempt mortgage revenue bonds. (F) Teitz

239. Housing Policy Seminar. (3) Three hours of seminar and discussion per week. Prerequisites: 230, 231 or equivalent and one studio. Readings, field work, and directed research on housing policies, their history, formulation, implementation, and evaluation. (SP) Landis, Teitz

240. Theories of Urban Form and Design. (3) Three hours of lecture and discussion per week. Prerequisites: Consent of Instructor. The history and culture of urban design, physical planning, and conservation; the implicit theories, ideologles, language, and methods of the major movements in the field. A conceptual model for evaluation will be developed and applied to case studies of urban design and other environmental plans. (F) Southworth

246. Field Observation & Diagnosis of Urban Environment. (2) Four hours of seminar, discussion and field work per week. Prerequisites: Graduate student in Environmental Design. 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. (F) Jacobs

247. The Educative City. (1-3) Three hours of lecture and discussion per week (for 3 units). 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 Departments' posted full course description for field work required for each unit value. (SP) Southworth

248. Advanced Studio: Urban Design/Environmental Planning. (4) Two hours of seminar and four hours of studio per week. Prerequisites: 210 or 240. Advanced studio in urban design and land use and environmental planning. (SP) Bosselmann

250. Planning and Governing. (3) Three hours of lecture and discussion per week. Prerequisites: Consent of instructor. Theories of context of instruction. The history and culture of urban design, physical planning, and conservation; the implicit theories, ideologles, language, and methods of the major movements in the field. A conceptual model for evaluation will be developed and applied to case studies of urban design and other environmental plans. (F) Southworth

On leave, spring

*On leave, spring

Recalled to active service

Recipient of Distinguished Teaching Award
mental intervention in self-regulating social systems. Alternative planning strategies for conditions of un-
the complete absence of scientific knowledge.
edge. (F) Collignon

252. Theory and Practice of Implementation for
Planners. (3) Three hours of lecture and discussion per
week. Planning and implementation within the con-
text of governmental institutions; systems for choice
change and decision, including organizational behavior
and capacity for change, and processes of intergov-
ernmental relations. (SP) Staff

253. Political Economy and Planning. (3) Three
hours of seminar per week. A seminar for planning stu-
dents investigating the interaction of political-economic
forces and the planning process. The French planning
experience will be used as a base for examining
the literature from the various social sciences
for their relevance to development planning.
(SP) Inner

259. Advanced Topics in Planning Theory. (3)
Course may be repeated for credit. One 3-hour sem-
inat meeting per week. Prerequisites: 250, 253, 202 or
equivalent; 252 or equivalent. Selected advanced top-
ics in planning theory.

260. Introduction to Social Theory and Planning.
(3) Three hours of discussion and per week. Social
and demographic patterns in metropolitan ar-
eas. Urban and suburban life styles and studies of dif-
ferent community types. Selected social planning is-
sues and techniques, including social indicators and
social impact assessment.

262. Comparative Analysis of Urban Policies. (3)
Three hours of lecture and discussion per week. Pre-
requities: Graduate standing. Description, analysis,
et al., and evaluation of urban 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
renewal, citizen participation, social services, and de-
centralized urban management. (F) Castells

263A. Urban Services Planning and Financing. (3)
Three hours of lecture and discussion per week. A sur-
vey of planning issues in urban services, with special
attention to policy and technology alternatives, mu-
nicipal budgeting and finance of service, projecting need,
programming service delivery, physical facility
and manpower requirements, linkages of service plan-
in to land use and social planning. Course com-
plements 214 on Physical Infrastructure.

265B. Urban Services for the Third World Metropo-
lis. (3) No credit after taking 258. Three hours of lec-
ture and discussion per week. A survey of urban services
and related issues in nations currently in the process of
industrialization. Prerequisites: Consent of instructor.
(F) Hart

266. Program Planning and Evaluation. (4) Four
hours of lecture and discussion per week. Prerequi-
tives: 202, 204, 262, or 264. 213, 220 or equi-
ivalent. Formerly 266A and 247. Techniques and
process
of design, simulation, and evaluating
alternative sequence of actions to achieve objectives.
Examination of various forms of evaluation methods and
related materials to explain these issues in depth.
Course requires substantial background in Third World
country planning. (F) Hart

(3) Course may be repeated for credit. One 3-hour
seminar meeting per week. Prerequisites: 262 or 259
or equivalent; 204A-204B or consent of instructor. A
seminar on advanced topics in social policy or urban
services planning opportun
ity for students to gain
intensive review of their individual research.
(SP) Collignon

270. Regional and Urban Development Strategies
in Third World Countries. (3) Three hours of lecture
and discussion per week. Competing theories of re-
gional and urban development, trade and population
flows, effects of natural resource distribution,
ion of governmental services and infrastructure,
and poverty. Alternative strategies for influ-
cing settlement patterns. Review of experience to date
in various regions. (F) Turner

283. Introductory Graphics. (1.5) Three hours of
studio-discussion meetings per week. Prerequisites:
City Planning students or consent of instructor. Basic
instruction in graphics for planners having no design
background, nor expecting to become urban design-
ners. Half-course.

284. Topics in City and Metropolitan Planning.
(1-3) Course may be repeated for credit. Three hours
of lecture and discussion per week per module. Pre-
requi
sitions: Consent of Instructor. Analysis of selected top-
icies in city and metropolitan planning with emphasis on
social planning practice and urban policy for-
mation. In some semesters, optional 5-week, 1-unit
modules may be offered, taking advantage of guest
visitors. Check Department for modules at start of semester.
(F,SP) Teitz, Hart

291. Planning Theory. (1-3) The sequence may
vary from year to year. This is a year-long seminar de-
ing the following topics: theories of decision-
making and planning; public choice theory; episte-
omological bases for research and practice; political
economy and planning; alternative planning and pro-
ceses and the functioning of various institutional
frameworks for planning. Special additional topics will
be taught from time to time as 291F. Course will be
modular to permit students to enroll in segments of
course which will be, in general, sequential.

295. Supervised Research in City and Regional
Planning. (1-2) Course may be repeated for credit.
Regular meeting with faculty sponsor to be arranged.
Prerequisites: Graduate standing in department and
content of adviser and sponsor. Supervised experi-
ence on a research project in urban or regional plan-
ing. Any combination of 295, 297 courses may be
taken for a total of 6 units maximum towards the M.C.P.
degree. (F,SP)

297. Supervised Field Study in City and Regional
Planning. (1-2) Course may be repeated for credit.
Regular meeting to be arranged with faculty sponsor.
Prerequisites: Graduate standing in department and
content of adviser and sponsor. Supervised experi-
ence in field study in urban or regional planning.
Any combination of 295, 297 courses may be taken for a
total of 6 units maximum towards the M.C.P. degree.
A maximum of 3 units of 297 can be used for degree requirements. (F,SP)

298. Group Studies. (1-3) Course may be repeated
for credit. To be arranged by instructor. One to three
hours of meeting per week. Prerequisites: A; A- level
grades in sections M-Z: satisfactory/unsatisfactory grading.
Section C: To be arranged only in section C.
(F,SP)

299. Individual Study or Research. (1-12) Course
may be repeated for credit. Regular meetings to be ar-
anged with faculty sponsor. Prerequisites: Consent of
instructor and graduate standing. Individual study or re-
search program; must be worked out with instructor in
advances of signing up for credits. Maximum number of individual study units (295, 297, 299) counted toward the M.C.P. degree counts toward the M.C.P. degree. (F,SP)

602. Individual Study for Doctoral Students. (1-6)
Course may be repeated for credit. Regular meeting
with Faculty sponsor to be arranged. Must be taken on
a satisfactory/unsatisfactory basis. Prerequisites: Ph.D.
students only. 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 require-
ments for the doctoral degree. (F,SP)

Professional Courses

300. Supervised Teaching in City and Regional
Planning. (1-2) Course may be repeated for credit.
Regular meetings to be arranged with faculty sponsor.
Prerequisites: Graduate standing in department and
appointment as a teaching assistant. Supervised
Teaching experience in courses related to planning.
Any combination of 255, 257 courses may be taken for
a total of 6 units maximum toward the M.C.P. degree.

Interdepartmental Courses

Graduate Courses:

IDS 229. Urban Design in Planning. (3) Three
hours of seminar and discussion per week. Prerequisites:
Consent of instructor. This seminar will focus on urban
Design in the planning process, the role of environ-
mental surveys, methods of community involvement,
problem identification, goal formulation and alternatives
generation, environmental media and presentation, de-
sign guidelines and review, environmental evaluation
and impact assessment. Case studies. Sponsoring de-
partments: City and Regional Planning and Landscape
Architecture. (SP) Jacobs

IDS 248. Urban Design in Planning. (3) Three
hours of seminar and discussion per week. Prerequisites:
Consent of instructor. This seminar will focus on urban
Design in the planning process, the role of environ-
mental surveys, methods of community involvement,
problem identification, goal formulation and alternatives
generation, environmental media and presentation, de-
sign guidelines and review, environmental evaluation
and impact assessment. Case studies. Sponsoring de-
partments: City and Regional Planning and Landscape
Architecture. (SP) Jacobs

Related Courses in the Program in Public and
Nonprofit Management:

IDS 206. Advanced Seminar in Public and
Nonprofit Management. (3)

IDS 207. Managers and Management. (3)

IDS 208. Techniques of Management Control. (3)

IDS 209. Applied Microeconomics. (3)

IDS 211. Organizational Understanding for Man-
agers. (3)

IDS 216. Public Sector Accounting (3)

IDS 216. Financial Management. (3)

IDS 214. Strategic Management in the Public Sec-
ctor. (3)

IDS 217. Technology, Tasks, and Politics. (3)

IDS 218. Information Resource Management. (3)

IDS 219. Financing Tools for Public Managers. (3)

IDS 220. Management Professionals in Organiza-
tions. (3)

For information about these and other courses re-
lated to this program, see the section on Public and
Nonprofit Management.
Civil Engineering (College of Engineering)

Department Office: 760 Davis Hall, 642-3261
Chair: Dr. G. Cormell, Ph.D.

Professors:
- James M. Anderson, Ph.D., Cornell University. Analytic photogrammetry, surveying.
- David B. Ashley, Ph.D., Stanford University. Risk analysis and management.
- Robert C. Askew, Ph.D., University of Florida. Offshore and coastal structures, ocean and coastal engineering.
- William G. Godden, Ph.D., Queen's University, Ireland. Anil K. Chopra, Ph.D., University of California at Berkeley. Dynamics of structures, earthquake engineering.
- Keith C. Crandall, Ph.D., Stanford University. Risk analysis, management.
- Carlos Daganzo, Ph.D., University of Michigan. Transportation theory, mathematical analysis.
- Stephen A. Mahin, Ph.D., University of California at Berkeley. Structural engineering.
- Adolf D. May, Jr., Ph.D., Purdue University. Traffic operations and traffic systems.
- Stephen A. Mahin, Ph.D., University of California at Berkeley. Structural engineering.
- Robert E. Selleck, Ph.D., Emeritus.
- William J. Oswald, Ph.D., Emeritus.
- Harmer E. Davis, M.S., Emeritus.
- Ben C. Gerwick, Jr., B.S., Emeritus.

Assistant Professors:
- Jacob Lubliner, Ph.D., Columbia University. Mechanisms of solids.
- Abolhassan Astaneh-Asl, Ph.D., University of Michigan. Soil mechanics and concrete technology.
- Nishkian Professor Of Structural Engineering Emeritus.
- Associate Professors:
- Adib Kanafahi, Ph.D., (Director, Institute of Transportation Policy, new technology and management. coastal structures, ocean and coastal engineering.
- John Lysmer, Ph.D., University of Illinois. Structural mechanics.
- Richard E. Goodman, Ph.D., University of California at Berkeley. Geotechnical engineering, soil mechanics.
- Karl S. Pister, Ph.D., University of Illinois. Mechanics of materials.
- Tung-Yen Lin, M.S., Emeritus.
- William J. Oswald, Ph.D., Emeritus.
- Harmer E. Davis, M.S., Emeritus.
- Ben C. Gerwick, Jr., B.S., Emeritus.

The objective of the program at Berkeley is to provide the needed background for students who wish to pursue civil engineering as a profession and for students who wish to engage in teaching and research. The program is based on the concept that civil engineers must be well grounded in the sciences, broadly educated in humanistic and social sciences, and proficient in the principles and 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 engineering practice. The program also serves as preparation for graduate study in any of the specialized branches of civil engineering.

Civil engineering includes the following major areas of professional specialization:

**Construction engineering** deals with the management and engineering required to plan and execute construction projects concerned with the design, planning, construction, and operation of structures and systems.

**Environmental engineering** involves the design and planning of water quality management (municipal, industrial, and agricultural systems), air pollution control, and hazardous waste management.

**Geotechnical engineering** encompasses the fields of soil mechanics, foundation engineering, geologic engineering, rock mechanics, highway materials engineering, and geotechnical aspects of earthquake engineering. It is concerned with the design of structures founded on, in, or on which are placed structures.

**Hydraulic and coastal engineering** deals with the flow of water in all its physical aspects. The conception and design of systems and structures for water resources development, flood control and irrigation projects, river and harbor development, coastal and ocean engineering, and hydraulic aspects of water pollution control are among the major technical aspects of hydraulic engineering.

**Photogrammetry** and surveying embody the sciences concerned with precise measurement of the earth's surface to obtain reliable data for engineering design and location.

**Structural engineering** is concerned with the analysis and design of all types of structures, including earthquake-resistant design. Some, such as bridges, dams, office buildings, airports, and harbors, are directly within the field of civil engineering.

**Material engineering** is concerned with the development of adequate construction materials. It requires, first and foremost, an understanding of basic material properties such as mechanical and thermal response, microstructure behavior and durability. Structural materials include steel, concrete, aluminum alloys, titanium, plastic, and composites.

**Transportation engineering** is concerned with the planning, design, construction, operation, maintenance, and rehabilitation of transportation systems and facilities such as highways, railroads, urban transit, air transportation, logistics supply and their terminals.

**Water resources engineering** encompasses a broad approach to the interaction of human activities with the hydrologic cycle. This includes the development and management of surface and ground waters, water resources, economies of engineering, economic, and environmental constraints.

In addition, the department now offers a minor in structural engineering, designed specifically 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 Engineering Academic Affairs office, 750 Davis Hall.

**Curriculum for the Bachelor's Degree**

A total of 120 units is required. The program of study is described in detail in the Announcement of the College of Engineering (available without charge from the College of Engineering, University of California at Berkeley, CA 94720). All students must complete six courses of at least 3 units each in humanities and social studies selected from an approved list. Of these, at least one course must be a 4-unit course in English composition, one must be from a list of selected courses in History and Cultures, one must be from a list of selected courses in the Natural and Physical Sciences, one must be from a list of selected courses in Information, 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 min-
imum of two courses, at least one of which is in the upper division, must be taken from a single department. Other courses include:

Lower Division. Required: Mathematics 1A-1B and 50D-50E or equivalent, Engineering 7, 28, 36, and 45, Civil Engineering 85 and 92, and Statistics 25. Electives: 14 units including at least three units of basic science.

Upper Division. Required: Mechanical Engineering 104; Civil Engineering 100, 111, 120, 130, 140, 150 or 151. Prerequisites: a second course in a core subject plus 10 units of upper division civil engineering courses, nine units (six upper division) of free upper division electives.

Graduate Study

The Department of Civil Engineering comprises the following graduate groups: Construction Engineering and Management; Environmental Engineering; Geotechnical Engineering; Hydraulic and Coastal Engineering; Structural Engineering Mechanics and Materials (SEMM); Surveying and Photogrammetry; and Transportation Engineering. Within each group, specialized programs and interdisciplinary programs—including earthquake engineering, ocean engineering and water resources engineering—are also available. Students may pursue the academic degrees of M.S. and Ph.D., or the professional degrees of M.Eng. and D.Eng. The M.S. program is normally of one year's and the M.Eng. program of two years' duration; the doctoral programs require at least two years after the attainment of a master's degree, and include a dissertation or an equivalent design project. In addition, the department has concurrent programs with other departments leading to dual degrees: (1) M.S. in Engineering Management and Master’s in Business Administration (SEMM and the Department of Architecture), (2) M.S. in Engineering and Master of City Planning (Transportation and the Department of City and Regional Planning).

For more details, please consult the Announcement of the College of Engineering, or contact the department’s Academic Affairs Office in 750 Davis Hall.

Lower Division Courses 85. Engineering Survey Measurements. (3) Two 1-hour lectures per week. Prerequisites: Mathematics 1A-1B. Standards, units, calibration; measurement of distance, elevation, angles; systematic and random error analysis; adjustment of measurements; weighing; principles of least squares; directions; traversing; horizons, and vertical curves. (F,SP) Anderson

86. Plane Surveying. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: Trigonometry. Principles and practice of surveying, including use of theodolite, level, alidade; calculations of traverse, areas, volumes, curves; stadia and plane table mapping. (F,SP) Anderson

92. Introduction to Civil Engineering. (1) One 1-hour lecture per week. Must be taken on a pass/no pass basis. A course designed to familiarize the entering student with scope of civil engineering and its component specialty areas; to include study of actual projects and a field trip as appropriate. (F,SP) Crandall

Upper Division Courses 100. Elementary Fluid Mechanics. (4) Three 1-hour lectures and one 1-hour recitation per week, plus individual laboratory experiments. Prerequisites: Engineering 36. Principles of mechanics as applied to the statics and dynamics of continuous fluids; open and closed channel flow, fluid measurement, forces on submerged objects, pumps, turbines. Individual laboratory experiments conducted by the student. (F,SP Staff)

101. Hydraulics Laboratory. (2) One 1-hour lecture plus one 3-hour laboratory per week. Prerequisites: 102. Experiments in metering, open channel flow, hydraulic machinery, hydraulic models; special experiments designed by the student. (F) Harder

102. Advanced Hydraulics. (3) Three 1-hour lectures per week. Emphasis on phenomena in open channel flow, surges, nonuniform flow, sediment transport, hydraulic models, flood propagation, flow through porous media, computer applications. (SP) Harder

103. Hydrology. (3) Three 1-hour lectures per week. Prerequisites: 100. Introduction to the hydrologic cycle, aspects of meteorology, circulation of air and water at the earth's surface, interrelation between precipitation and runoff, groundwater flow, frequency and unit hydrograph analysis, stochastic methods for streamflow data generation, applications of hydrology in engineering design. (F) Staff

104. Design of Hydraulic Structures. (2) Two 1-hour lectures per week. Prerequisites: 100. To discuss factors important in the design of hydraulic structures, in-laid and coastal, including dam layouts, spillways, structural features; the selection and control of values, gates and other structures; tunnels, channel controls, offshore platforms, breakwaters, coastal protection works. The integrated design of engineering safety, economic, environmental effects, will also be covered. (SP) Shen

105. Hydromechanics—Fluid Mechanics of the Water Environment. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 100; Math 50, 50A, or equivalent. Kinematics of flow, Reynolds equations, turbulent flow, shear flows, diffusion and dispersion. Focus on flow patterns in the water environment. (F) Sobej

111. Introduction to Sanitary/Environmental Engineering. (4) Three 1-hour lectures and one 1-hour discussion per week. Prerequisites: 100. The application of science and engineering to the study of water quality. Topics include provision of an adequate water supply, wastewater disposal and the use of physical, chemical and biological processes for the treatment of water and wastewater. (F,SP) Hunt & Nazaroff

112. Sanitary Engineering Design. (3) Three 1-hour lectures. Prerequisites: 111 may be taken concurrently. Lectures and discussions of the nature of engineering organizations; role of design in engineering practice, and concepts of project and economic evaluation. Parallel problem assignments illustrating the application of design principles to typical units of water and wastewater treatment systems. Staff

113. Applied Limnology. (2) Two 1-hour lectures per week. Prerequisites: Upper division standing. Introduction to freshwater and saline lakes, reservoirs, streams, and estuaries; physical and chemical structure of aquatic ecosystems; plankton; ecology; eutrophication and pollution. The course is the first part of a sequence including 210A-210B and Forestry 178. (F) Home

114. Fundamentals of Sanitary Engineering. (2) Two 1-hour lectures per week. Prerequisites: Upper division standing in Engineering Science or Public Health. Water supply and treatment; wastewater collection, treatment, and disposal; solid waste management; waste reclamation; advanced and appropriate technology.

115. Chemistry of Waters. (2) Two 1-hour lectures per week. Prerequisites: Chemistry 1A. A consideration of the organic components in water in terms of water quality. Emphasis is placed on the application of chemical principles employed to modify the concentration of the major anions, cations, and dissolved gases comprising the inorganic constituents. (F) Hermanowicz

116. Water Chemistry Laboratory. (2) One 1-hour lecture and three hours of laboratory/demonstration per week. Prerequisites: Chemistry 1A or consent of instructor. Practical laboratory aspects of important chemical measurements used in assessment of water quality and efficiency of water and waste treatment processes. Considers gravimetric, titrimetric, spectrophotometric, and electrochemical methods. Laboratories on turbidity, conductivity, flocculation, dissolved oxygen, chlorine residual, BOD, COD, nitrogen forms, hardness, alkalinity, chloride, fluoride, solids, conductivity. (F) Hermanowicz

117. Environmental Organic Chemistry. (2) Two 1-hour lectures per week. Prerequisites: Chemistry 1A or consent of instructor. Aspects of organic chemistry relevant to environmental effect and fate of chemicals are addressed. Topics selected from: nomenclature; environmentally important reactions and properties of organic compounds and their prediction; photochemical reactions in water and air; production and removal of odorous compounds; natural organic matter; natural and synthetic polymers; biochemical importance of actions; biodegradation and recalcitrant compounds; methods of analysis in environmental samples. (SP) Jenkins

119. Solid and Hazardous Waste Disposal. (2) Two 1-hour lectures per week; plus two 1/2 day field trips. Prerequisites: Consent of instructor and Upper Division standing. Practical aspects of solid and hazardous waste management with emphasis placed on state-of-the-art technology and inter-relationship of environmental, economic, and resource recovery constraints. Project report required at end of term. (SP) Harder

120. Introduction to Structural Analysis. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 130. Analysis of statically determinate and indeterminate structures using statics, kinematics, vibration, and energy forces, and displacement methods and moment distribution. Staff

121. Introduction to Dynamics of Structures and Earthquake Engineering. (3) Two 1/2 hour lectures per week. Prerequisites: 120, Mechanical Engineering 104. Analysis of response of structures to dynamic forces with emphasis on response to earthquake ground motion and in earthquake resistant design of structures. (F) Staff


130. Mechanics of Materials I. (3) Three 1-hour lectures per week. Prerequisites: Engineering 36. Intro-duction to the mechanics of deformable solids; elastic and plastic deformation; resistance of structures to deformation; analysis for bars, shafts, beams, and columns; combined stresses; energy methods; statically indeterminate systems; elastic stability and buckling. (F,SP) Kelly, Sackman

131. Mechanics of Materials II. (3) Three 1-hour lectures per week. Prerequisites: 130. Mechanics of thin-walled structures for boxgirder, aircraft, and ship structures. Stress, deformation, and stability analysis, torsion and bending, buckling, and post-buckling strength of thin sheet elements; plastic instability; consideration of sandwich components; thermal stresses, thermal buckling. (SP) Sackman

140. Fundamentals of Structural Design & Applications to Reinforced Concrete. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 160 and 120. Introduction to design of structural systems and elements. Design criteria; sources of loads; working stress and strength design theories; analysis and design of reinforced concrete elements, including beams, slabs, and columns. (SP) Sackman

141. Design of Steel Structures. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 140. Design of structural systems in steel; working stress and plastic design methods; mechanical, architectural, and structural provisions for steel columns; bolted and welded connections; design of tension members, compression members, beams, and beam-columns. (F,SP) Astaneh
142. Structural Design in Timber. (2) Two 1-hour lectures per week. Prerequisites: 120 (may be taken concurrently). Characteristics and properties of wood and design and detailing of structural elements and entire structures of wood. Topics include working stresses, design and detailing of plain and glulam beams, columns, connections, plywood diaphragms, and framing systems. (F) Mahin

143. Reinforced Concrete Design. (2) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 140. Design of structural systems in reinforced concrete. Floor systems, walls, columns, and footings. Design for service and ultimate loads. Detailing for ductile behavior. (SP) Moehle

144. Design of Structural Systems. (3) Two 1-hour lectures per week. Prerequisites: 140; 141 (may be taken concurrently). Conceptual design of structural systems to meet stated objectives. Actions to which structural systems are subjected. Characteristics of various systems and their approximate analysis. Shear systems in wood and concrete. Detailing for strength and economy. (F) Staff

148A. Structural Systems I. (3) Three 1-hour lectures per week. Prerequisites: Architecture 150, Analysis 206, and one 3-hour laboratory per week. Prerequisites: 140; 141 (may be taken concurrently). Analysis of indeterminate structural systems. Sources of vertical and lateral loadings. Design of multi-story and long-span structures. Not available to Civil Engineering students. (SP) Godden

150. Introduction to Transportation Engineering. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 85; Statistics 25. General characteristics of transportation systems: streets and highways, rail, transit, air, water. Capacity considerations: time-space diagrams, queuing. Transport system design: horizontal and vertical alignment, cross-sections, earthwork, drainage, pavements. Economic analyses. Operations, maintenance, rehabilitation, energy, environmental considerations. (FSP) Daganzo, May, Montooth

151. Introduction to Transportation Planning and Implementation. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: Statistics 25 and Engineering 7. Planning and investment decision making for urban facilities: planning and implementation of transportation planning. State planning and needs and cost allocation studies. Rail, water, and air transportation planning. Forecasting and new technology. (SP) Garrison, Kanafani

153. Design and Construction of Transportation Facilities. (2) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 175; 150 or 151. Geometric, drainage, and guideway design for, and construction and rehabilitation of, transportation facilities, particularly streets, highways, railroads, and airfields. (FSP) Statkora

160. Properties of Civil Engineering Materials. (2) One 1-hour lecture and one 3-hour laboratory per week. Prerequisites: 130 (may be taken concurrently); Engineering 45. Introduction to properties of concrete engineering materials, such as cements, aggregates, concrete, asphalt, wood, plastics, and structural steel. Experiments for evaluating behavior of these materials under simple conditions. (FSP) Mehta, Monteiro

161. Concrete Materials. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 100. Composition and properties of materials required to make concrete. Portland cements, supplementary cementing materials, such as fly ash, granulated blastfurnace slag, cementation by ground granulated blast-furnace slag, lightweight expanded shale. Water reducing, set retarders, and air entraining admixtures. Laboratory experiments on concrete materials evaluation, and their effect on strength and durability characteristics of concrete. (SP) Monteiro

165. Concrete Construction. (2) Two 1-hour lectures per week. Prerequisites: 160. Consideration of the broad aspects of use of concrete in construction; technical requirements for selection of materials; control of quality; types of concretes used for construction of buildings, highways, airfields, bridges, dams, and hydraulic structures. (F) Mehta

166. Engineering Construction. (3) Two 1-1/2 hours lectures per week; field trips. Prerequisites: Upper division standing. The construction industry: its development, components, organization, and importance, construction methods and practices, applications and limitations; factors involved in the selection of plant equipment and computerized methods of planning and organization and operating construction forces, and estimating costs. (F) Crandall

167. Economics and Management of Engineering Systems. (3) No credit will be given after Engineering 120. Students who have taken 120 must take 1 unit of Engineering 147 to fulfill 167 requirement. Two 1-1/2 hour lectures per week. Prerequisites: Upper division standing. Principles of economics, optimization, and management techniques applied to the planning, design, and operation of engineering systems; professional relations; contracts and specifications. (F,SP) Ashley, Crandall

168. Fire Protection Engineering. (2) Two 1-hour lectures per week. Prerequisites: 160 and 130. Introduction to fire protection engineering which will give the student the framework for solving fire protection problems. Model building codes are introduced with emphasis on fire safety provisions. Relationship between these codes and fire protection engineering is presented. (F) Williamson

169. Polymers in Construction. (2) Two 1-hour lectures per week. Prerequisites: Upper division standing. Fundamentals of polymers in construction, particularly urban housing structures; technical requirements and performance specifications; selection of materials; relationship of mechanical properties to microstructure; fire safety; weatherability; manufacturing techniques; use of sealants and coatings on structures. (SP) Williamson

170. Engineering Geology. (2) Two 1-1/2 hour laboratory/laboratory demonstrations per week. Principles of physical and structural geology; the influence of geographic factors on urban facilities; design, and construction of engineering works. Field trip. (FSP) Brekke, Sitar

171. Introduction to Geological Engineering. (3) Two 1/2-hour lectures per week. Prerequisites: 170 or an introductory course in Physical Geology. Geologic and geographical exploration for structures in rock; natural Resources for construction; geological engineering of underground openings; evaluation of dam sites. (SP) Brekke

173. Groundwater and Seepage. (3) Two 1/2-hour lectures per week. Prerequisites: Senior 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 geology, contaminant transport, and design of waste containment systems. (F) Rutter

175. Soil and Foundation Engineering. (3) Two 1-hour lectures and one 3-hour discussion/laboratory demonstration per week. Prerequisites: 100, 130, 170 (one of which be taken concurrently). Soil formation and identification. Physical and mechanical properties of soils and lateral earth pressures on structures. Site investigations, design of substructures, construction problems in foundation engineering. (FSP) Lysmer, Sitar

177. Soil Properties and Their Engineering Application. (2) One 1-hour lecture and one 3-hour laboratory period per week. Prerequisites: laboratory testing of soils and use of results in solving geotechnical problems. Students assume role of consultant and instructor assumes role of client. Soil test results are used to develop recommendations that are conveyed in four short engineering reports. (F)Chan, Seed

179. Asphalt and Asphalt Mixtures. (2) One 1-hour lecture and one 3-hour laboratory period per week. Prerequisites: Senior standing in Civil Engineering. Physical properties of asphalts, aggregates, and their combinations; principles and practices in the design and construction of asphalt paving mixtures; laboratory tests for asphalts, aggregates, and mixture design. (F) Chan, Murlin

185. Control Surveys. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 85 or 86 with consent of instructor. Vertical control, precise levelling; horizontal control, triangulation, trilateration, triangulation by electronic distances; least squares adjustment of control survey observations; state coordinate system; astronomical observations for latitude and azimuth. (F) Anderson

186. Elementary Photogrammetry. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 85 or equivalent. Simple, compound, reverse, and transition horizontal curves; vertical parabolic curves; reconstructions, preliminary photographs; computations of earthwork and related quantities; alignment studies. (SP) Anderson

188. Aerial Photo Analysis and Interpretation. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: Senior standing in engineering, geology, or geography. Principles of photo reading, analysis, and interpretation applied to soils, slopes, geological forms, and structures; selection of materials for engineering construction.

192. The Art and Science of Civil Engineering Practice. (1) Three 1/2-hour lectures per week. Prerequisites: Senior standing in Engineering. A series of lectures by distinguished civil engineers designed to provide an appreciation of the role of science, technology, and the needs of society in conceiving projects, balancing the interplay of conflicting demands, and utilizing a variety of disciplines to produce unified and efficient systems. (SP) Crandall


199. Supervised Independent Study. (1-4) Course may be repeated for a maximum of four units per semester, for a maximum of one unit on a passed/not passed basis. Prerequisites: Consent of instructor and major advisor, Supervised Independent study. Please see pages 91-92 of the General Catalog for: description and prerequisites. (FSP) Staff

Graduate Courses

200. Coastal Mechanics. (3) No credit if 205A completed prior to Fall 1991. Three 1-hour lectures per week. Prerequisites: 105 (may be taken concurrently). Formerly 205A. An introduction to the mechanics of the coastal environment; linear wave theory, kinematics, dispersion, mass transport radiation stress, energy flux, current, shoaling, re-
fraction, deformation; real sea states; wind wave prediction; wave climate; wave loading; tides and tidal circulation; storm tides; lab experiments. (SP) Sobey

201. Physical Oceanoiy. (2) Two hours of lecture per week. Prerequisites: 105. Applied fluid mechanics of the ocean, with emphasis on large-scale flows and currents on the continental shelf and the deep ocean. Topics include hydrostatic stability, barotropic and baroclinic motions, free and forced long gravity waves, oceanic mixed layers, Ekman transport, atmospheric tides, storm surge, coastal upwelling, Kelvin and continental shelf waves, ocean circulation and Western boundary currents. (F)

203. Surface Water Hydrology. (3) Three hours of lecture per week. Prerequisites: Consent of the instructor. One hour lecture per week on the earth’s surface, precipitation and streamflow measurement and characteristics, frequency analysis of precipitation and runoff, relationship between rainfall and runoff, flood routing, time series analysis, and stochastic data generation models. (SP) Sobey

204. Wave Hydrodynamics. (3) Three hours of lecture per week. Prerequisites: 100. Applied fluid mechanics of short, surface gravity waves. Topics include linear wave theory, wave properties, shallow water transformations, high frequency waves, wave spectra and wave generation. (SP) Sobey

205A. Coastal Processes. (3) Three hours of lecture per week. Prerequisites: 205B completed prior to Spring 1991. Three 1-hour lectures per week. Prerequisites: 200 (105 recommended). Formerly 205B. Breakers and surf, breakwaters, surface zone dynamics, coastal sediment transport, shelf protection measures, submarine pipelines. (SP) Foda

205B. Wind & Wave Forces on Marine Structures. (3) Three 1½ hour lectures per week. Prerequisites: 241A-241B concurrently or 205A. Determination of wind and wave forces on coastal structures, pipelines, fixed and mobile offshore platforms. Evaluation of nominal and extreme loads and combinations of wind and wave loads. Determination of wave and wind loading. Evaluation of accuracy of analytical models based on field and laboratory data. Also listed as IDS 205 and Naval Architecture 205B. (SP) Bae

206. Computational Methods in Open Channel Flow. (3) Three 1-hour lectures per week. Prerequisites: Mathematics 50A or equivalent. Numerical methods applied to nonsteady flows in rivers and estuaries, flood wave propagation, automatic control of water supply systems. (SP) Chen

207. Sediment Transport Mechanics. (3) Three hours of lecture per week. Prerequisites: 102 or consent of instructor. Sediment transport in rivers, estuaries, and confined conduits. Measurement techniques, modeling of river systems, hydraulic mechanics. (SP) Shen

208A. Hydrologic Mixing Processes. (3) Three hours of lecture per week. Concepts of hydrologic diffusion and transport of constituent mixing; mixing in rivers, reservoirs, and estuaries.

208B. Hydrologic Mixing Processes. (2) Two hours of lecture per week. Prerequisites: 208A. Numerical and physical modeling of dispersion in estuaries and reservoirs; mixing in stratified flows.

210A. Advanced Applied Limnology: Plankton Ecology. (2) Two hours of lecture per week. Prerequisites: 113 (may be taken concurrently), Forestry 178, or equivalent. Physical, chemical, and biological factors governing algal and zooplankton abundance in lakes, reservoirs, estuaries, and the ocean. Methods of measuring plankton. This course is part of a sequence composed of CE 113, Forestry 178, CE 210A, 210B, and Forestry 278. (SP) Home

210B. Seminar in Advanced Applied Limnology and Oceanography. (1) Two hours of lecture per week. Prerequisites: 113, 210A, Forestry 178. Lectures and group discussions with emphasis on ecological topics of current interest in lake, reservoir, river, estuarine, or ocean ecology. The topic will change each year. Emphasis on global coverage of all trophic levels. This course is part of a sequence composed of CE 113, Forestry 178, CE 210A-210B, and Forestry 278.

211. Water Treatment Engineering. (3) Course may be repeated for credit. Three 1-hour lectures per week. Prerequisites: 111 & 115 (both may be taken concurrently). Water treatment uses processes, standards, and regulations. Concepts of mass balance and chemical reactor theory applied to water quality improvement. Specific topics include gas transfer, particle precipitation, ion exchange, adsorption, and disinfection. (F) Sobey

212. Wastewater Treatment Engineering II. (3) Three 1-hour lectures per week. Prerequisites: 111 and 115. Wastewater discharge and receiving waters. Standards, primary, secondary and tertiary wastewater treatment processes, and waste management. Emphasis on design and inclusion. Included are primary treatment, biological treatment, activated sludge, fixed film filters, anoxic digestion, and nutrient removal. (SP) Hermanowicz

213. Applied Ecology Laboratory. (1) One 3-hour laboratory/demonstration per week. Prerequisites: 113 or consent of instructor. Laboratory and field experience with the major tests which form the basis of most sanitary/environmetal regulations. Considers bacteriological, chemical, and acute toxicity, algae bioassay, sampling, and taxonomic tests. Some tests will be extended to cover state-of-the-art measurements which may form the basis of future regulations. (F) Sobey

214. Aquatic Chemistry. (2) Two 1-hour lectures per week. Prerequisites: 115 (may be taken concurrently) or consent of instructor. The application of equilibrium and kinetic models and physical, chemical, and biochemical principles applied to the description of the concentration and behavior of natural waters, water and wastewater treatment processes, and water pollution control problems. A quantitative description of the concentration of important elements in natural waters and their significance in water quality. (F)

215. Process Engineering Laboratory. (3) One hour of lecture and six hours of laboratory per week. Prerequisites: 116, 211, 212 (may be taken concurrently). Unit operations and processes for water and wastewater treatment. Lectures and laboratories on tracer, filtration, aeration, ion exchange, chemical treatment of wastewater, biological filters, activated sludge, and anaerobic digestion. (SP) Hermanowicz

216. Industrial and Hazardous Waste Treatment. (3) Three 1-hour lectures per week. Prerequisites: 211 and 212 (taken concurrently). Theory and design of water and wastewater treatment processes for industrial applications. Emphasis will be placed on process technology that transcends conventional municipal water and wastewater treatment, and is required for compliance with current regulations for pretreatment as well as discharge of industrial wastes. (SP) Kavanaugh

217. Process Kinetics in Environmental Engineering. (3) Three 1-hour lectures per week. Prerequisite: 211 (May be taken concurrently or consent of instructor). Chemical reactor theory, mass transfer, homogeneous and heterogeneous reactions as applied to water and environmental engineering processes. Packed and fluidized bed reactors in chemical reactors. (SP) Nazaroff

218A. Air Quality Engineering. (3) Three 1-hour lectures per week. Prerequisites: Engineering 150 or graduate standing. Fundamental quantitative description of atmospheric physics and chemistry of air pollutants. Pollutant generation in combustion systems, atmospheric photochemistry, transport and dispersion of pollutants, pollution control, pollutant acids, and deposition. (F) Nazaroff

218B. Air Quality Engineering. (3) No credit if taken after 218C prior to Spring 1989. Three 1-hour lectures per week. Prerequisites: 218A or graduate standing. Formerly 218C. Fundamental quantitative description of atmospheric chemistry and physics of air pollutants. Properties and dynamics of atmospheric aerosols, gas to particle conversion processes, formation and control of particles, visibility degradation. Approaches to air pollution monitoring and control. Indoor air quality. (SP) Nazaroff

218C. Toxic Air Management. (1) No credit after taking 218B prior to Spring 1989. One hour lecture per week, plus three field trips. Prerequisites: Engineering 140 or consent of instructor. An overview of indoor and outdoor air quality, health effects, air quality management programs, and physical science principles of various methods for measuring pollutants concentrations. (SP) Wesolowski

219. Contaminant Transport Processes. (3) Three hours of lecture per week. Prerequisites: 100 and 111 (173 recommended). The fate of contaminants that the environment is controlled by transport processes within a single media and between media. The similarities in contaminant dispersion within air, surface water, and groundwater will be emphasized. Computer transport processes such as volatilization and adsorption will then be considered from an equilibrium perspective followed by the kinetics of mass transfer across environmental interfaces. (SP) Hunt

220. Theory of Structures. (3) Three hours of lecture per week. Prerequisites: 120. Analysis of structures by force (flexible) methods and by displacement (stiffness) methods; matrix methods suited for digital computer solution. Virtual work, real and complementary energy, and other classical theorems of structural analysis. (F) Powell


224. Analytical Methods in Civil Engineering. (3) Three hours of lecture per week. Prerequisites: 130 or Mechanical Engineering 104. Introduction to the solution of partial differential equation boundary value problems as they occur in civil engineering to cover vibration, heat flow, and diffusion. Separation of variables, Laplace, and Fourier transforms. Calculus of variations, optimization. (F) Kelly

225. Dynamics of Structures. (3) Three hours of lecture per week. Prerequisites: 220. Analysis of forces and deformations in structures, idealized as discrete parameter systems, due to dynamic forces, moving loads and earthquake ground motion. Exact and approximate methods. Analysis of linear and nonlinear response; response spectrum estimates; estimates of maximum response; effects of inelastic behavior. Laboratory demonstrations. (F,SP) Chopra, Avedisian

227. Earthquake-Resistant Design. (3) Three hours of lecture per week. Prerequisites: 225 (may be taken concurrently) and 243. Design of structures to resist earthquakes and other environmental excitations. Human sensitivity to vibrations. Establishment of Design Criteria; elastic and inelastic response spectra. Site suitability analysis. Selection of structural configuration. Materials and nonstructural elements. Preliminary design. (SP) Chopra

228. Earthquake Engineering Analysis. (3) Three hours of lecture per week. Prerequisites: Second year graduate standing in engineering, 225 and Statistics 25. Methods for earthquake response analysis of complex structures, including structure-foundation-soil interaction, and interaction with fluids. Comparison of analytical predictions and recorded earthquake response. Response characteristics of various types of structures. (SP) Chopra

229. Experimental Dynamics and Model Analysis. (3) Two 1-hour lectures and one 3-hour laboratory. Prerequisites: Graduate standing in engineering. Experimental behavior of structures, Dynamic loading; steady-state, seismic, impact. Static loading, buckling, interaction effects. Instrumentation for strain, displacement, stress; data acquisition and reduction. Dimensional analysis and theory of models for predicting structural response. Structural models in research and design. (SP) Godden

230. Advanced Mechanics of Materials. (3) Three 1-hour lectures per week. Prerequisites: 130 or equivalent. Analysis of load-carrying structural members: stress, strain, compatibility. Stress-strain relations for elastic and plastic materials. Work, energy, and virtual work. Bending of flat plates, beams on elastic supports. Stress, strain, and plastic buckling of columns and plates. (F) Sackman

231A. Mechanics of Solids. (3) Three hours of lecture per week. Prerequisites: 130. Measures of deformation and stress; equations of motion for de- formable solids; constitutive relations for elastic, plastic; viscoplastic; and viscoelastic materials; work, energy, and bending and torsion; two-dimensional elasticity. (Formerly 230) (F) Kelly, Lubliner

231B. Structural Mechanics. (3) Three hours of lecture per week. Prerequisites: 231A. Static and dynamic beam theories; thin plate theories; vibration and buckling of plates. Structural stability (equilibrium, energy, dynamic methods; nonconservative systems). (SP) Kelly

232. Mechanics of Nonlinear Solids. (3) Three hours of lectures per week. Prerequisites: 231A. Constitutive equations for plastic, viscoplastic, and viscoelastic materials; work, energy, and bending and torsion; two-dimensional elasticity. (F) Forman


233B. Computational Mechanics II. (3) Three hours of lecture per week. Prerequisites: 233A or consent of instructor. Unified treatment of problems, involving mechanical and thermal phenomena interacting with solids and structures; consistent linearization of non- linear theory; variational techniques; implications for applications to computational methods, including finite element methods applied to finite deformation problems. Formerly 233A. (SP) Taylor, Plater

234A. Thermomechanics of Deformable Bodies I. (3) Three hours of lecture per week. Prerequisites: 231A. Mathematical preliminaries (normed vector spaces, differentiation, vector and tensor fields); kinematics and physics of deformable bodies (balance principles, energy, elasticity). To be offered depending on student demand and faculty availability.

234B. Thermomechanics of Deformable Bodies II. (3) Three hours of lecture per week. Prerequisites: 234A. Equilibrium statistical mechanics and thermomechanics (ensemble theory, Carnot's theorem, rubber elasticity); non-equilibrium thermomechanics, constitutive theory (viscosity and heat conduction, internal variables material with memory, viscoplasticity, elasticity, plasticity, fracture), behavior of beams, plates, and shells. (F) Achenbach

235A. Advanced Computational Mechanics. (3) Three hours lecture per week.

235B. Plasticity. (3) Three hours lecture per week.

235C. Viscoelasticity. (3) Three hours lecture per week.

235D. Stability. (3) Three hours lecture per week.

235E. Fracture Mechanics. (3) Three hours lecture per week.

235F. Mechanics of Composites. (3) Three hours lecture per week.

235G. Shell Theory. (3) Three hours lecture per week.

235H. Three-Dimensional Elasticity. (3) Three hours lecture per week.

235I. Wave Propagation. (3) Three hours lecture per week.

240. Advanced Civil Engineering Materials. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 160 or equivalent. Structures of concrete, wood, and construction steels is discussed; differences and similarities in regard to environmental effects, elastic modulus, strength and durability. Experimental methods are demonstrated for investigation of structural and properties of those materials. (SP) Mehta, Monteiro, Williamson

241. Advanced Concrete Technology. (3) Three hours lecture per week. Prerequisites: 160 or equivalent. Composition and properties of concrete-making materials such as aggregates and different types of Portland cement. Issues in the production and use of lightweight concretes, polymer-containing concrete, mass concrete, light-weight concrete and heavyweight concretes, polymer-containing concretes, and fiber-reinforced concrete. (SP) Mehta

242. Concrete Behavior. (3) Two 1-hour lectures and a 3-hour laboratory per week. Prerequisites: 160 or equivalent. Relationship between concrete microstructure and mechanical properties. Composite materials theory for concrete. Viscoelasticity; plasticity; fracture mechanics; thermal behavior and durability of concrete. Use of instrumentation, design and modern experimental techniques employed in concrete research. (SP) Monteiro


244B. Advanced Reinforced Concrete II. (3) Three hours of lecture per week. Prerequisites: 244A. Limit states design of reinforced concrete structures. Design of columns and and ductile and post-tensioning of prestressed concrete frames and framework systems; first and second order theories. Behavior of beam-column joints. Design of slabs; recent advances in application of yield-line theory and strip methods. (SP) Mohebi

245. Prestressed Concrete Design. (3) Three hours of lecture per week. Prerequisites: 220 and 140. Application of current codes and analytical procedures. Behavioral and design of prestressed concrete elements and systems—continuous beams, frames, slabs, bridges, buildings; partial prestress. (SP) Staff

246. Design of Concrete Shells. (3) Three hours of lecture per week. Prerequisites: 220 and 140. Analysis and design of concrete and prestressed concrete structures and hybrid structures. Comparison of design codes. (SP) Astaneh

247. Advanced Steel Design. (3) Three hours of lecture per week. Prerequisites: 141. Advanced topics in steel design. Design of plate girders, composite constructions and hybrid beams considering strength, stiffness, stability, and fatigue. Design of welding steel and modern welding techniques on design. Design considerations for connections with emphasis on tubular structures. (SP) Astaneh

248. Inelastic Design of Steel Structures. (3) Three hours of lecture per week. Prerequisites: 243. Inelastic analysis and design of steel members subjected to combined stresses due to bending, shear, axial loads, and torsion. Local and lateral buckling of members. Design of connections. Design for strength, ductility and stability for arches, grids and plates. (F) Barterto

249. Structural Reliability and Risk Analysis. (3) Three hours of lecture per week. Probability theory and random processes; bases for structural reliability and risk analysis. First order, second moment, and full distribution methods for reliability; probabilistic design codes; load and load combination; reliability against fatigue; seismic risk analysis of structural systems and lifeline networks. (SP) Der Kiureghian

250. Transportation Policy and Planning and Development. (2) One 1-hour lecture per week. The evolution of the U.S. transportation system. Growth and decline of the railroads and mass transportation. The development of highway transportation systems. Growth and decline of the railroads and mass transportation. The development of highway transportation systems. Economic changes that shaped the transportation system. Transportation planning and government, public/private partnerships, policy analysis and program evaluation. (SP) Garrison

251. Operation of Transportation Facilities. (2) Two 1-hour lectures per week. Prerequisites: Graduate standing or consent of instructor. Route, network, and control methods and models; traffic flow, density, and speed; headways; queueing; technology. Planning, implementation, and operation of control technologies. (F) Dagnino, May, Newell

252. Systems Analysis in Transportation. (2) Two 1-hour lectures per week. Prerequisites: Graduate standing or consent of instructor. The systems approach and its application to transportation engineering and planning. The transportation system as a production system. Production optimization and cost allocation techniques. Economic changes that shaped the transportation systems. Systems analysis techniques including optimization, evaluation, and systems modeling. (F) Hansen, Karafili

252L. Computer Application in Transportation Analysis. (1) Three laboratory hours per week. Computer applications to transportation analysis. The course covers fundamentals and recent developments in areas such as computer graphics, census data systems, geographic information systems, simulation and artificial intelligence. CE 265L and 252 may be taken concurrently. Prior experience with computers and probability and statistics is required. This course does not satisfy the laboratory

*On leave, spring
Recalled to active service
Recipient of Distinguished Teaching Award
253. Principles of Transportation System Design. (2) One 2-hour lecture per week. Prerequisites: 251, 252 (may be taken concurrently). Design parameters, including land and environmental constraints. Design of system components; consideration of system safety and failure in design; design for operations flexibility and for maintenance. (F) Hansen

254. Transportation Economics. (3) Students with credit in 261 receive only 2 units. Two 1½-hour lectures per week. Prerequisites: 252 or consent of instructor. Application of micro- and macro-economic concepts to transportation systems. Urban and international travel demand analysis. Freight demand, Project and cost. Socio-environmental analysis. Analysis of social cost. Investment analysis and pricing theory. Economic impact analysis. Role of economic analysis in decision making. (SP) Hansen, Kanafani

254L. Transportation Planning Applications. (2) Two 1-hour classes and three hours to be arranged per week. Prerequisites: Consent of instructor. The analysis of land use and traffic data to develop traffic models. The use of transportation demand models in urban and regional travel demand analysis. The forecasting of demand, and the design and evaluation of mass transportation networks. Use of computers in transportation planning and analysis. (SP) Hansen

255. Highway Traffic Operations. (3) Three 1-hour lectures 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 each having its unique analytical framework. Major topics to be covered include policy and institutional issues, selection of strategies and tactics, evaluation of objectives and measures of effectiveness. (SP) May

255L. Highway Traffic Operations Laboratory. (1) One 3-hour laboratory per week. Prerequisites: 255 (may be taken concurrently) or consent of instructor. Operational planning and management of the highway transportation system. Designed to be taken concurrently with 255. Laboratory emphasis will be given to field studies, mathematical analyses, and model applications. (SP) May

256. Transportation Planning. (3) One 3-hour lecture per week. Critiques of urban, regional, and national planning methods and methodologies. Strategic versus tactical planning. Current research and research needs. (F) Garrison

257. Applications of Queuing Theory to Transportation. (2) Two 1-hour lectures per week. Deterministic queuing models with application to rush hour traffic, highway bus dispatch, and etc. Stochastic models, Poisson arrivals, light traffic and diffusion approximations. (SP) Newell

258. Freight Transportation. (3) Two 1½-hour lectures per week. Analysis of the performance characteristics of the freight transportation modes. Railway and truck systems are examined and compared with others. Next, rail equipment is examined and equipment interaction considered and compared with other modes. Systems are examined by expository lectures and discussions. Performance characteristics are defined by model systems and compared by comparisons across modes. Current research, technology, and policy. (SP) Garrison

259. Public Transportation Systems. (2) Two 1-hour classes per week. Prerequisites: 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) Staff

259L. Public Transportation Systems Laboratory. (1) One 3-hour meeting per week. Prerequisites: 259 (may be taken concurrently). Design and evaluation project of a public transportation facility. (SP) Staff

260. Air Transportation. (3) Three 1-hour lectures per week. Prerequisites: Graduate standing or consent of instructor. Nature of civil aviation; structure of the airline industry; aircraft performance; airport noise; navigation and traffic control; airport planning and design; airline operations; aviation system planning. (F) Hansen, Kanafani

260L. Air Transportation Planning. (1) One 3-hour 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

262. Analysis of Transportation Data. (2) Two 1 hour sessions per week. Prerequisites: Statistics 134 or equivalent course or equivalent. Use of field data in transportation. Data gathering techniques, sources of errors, considerations of sample size. Experiment design for demand forecasting and transportation operations analyses. Analysis techniques. (SP) Daganzo

263. Operations of Transportation Terminals. (3) Two 1½-hour sessions per week. Prerequisites: Graduate standing or consent of instructor. Characteristics of terminals on a mode by mode basis (sea ports, rail yards, airports). Techniques used to study terminal operations and the management of congestion. (Chorographs, input-output diagrams, pricing, simulation). Studies illustrating the use of the methodologies for design. (SP) Daganzo

264. Transportation Networks. (1-2) The course consists of two parts: 264A for 1½ semester; followed by 264B and/or 264C. Part A treats mathematical modeling of the geometric aspects of networks common to private and public and freight transportation. Part B then deals with the analysis of flows (mostly private automobile traffic) whereas Part C deals with the movement of goods. (F)

264A. Graphs, Metrics and Routing. (2) One 1-hour lecture and one 2-hour lecture per week for ½ of the semester. Fundamentals of network flows, graph theory, shortest paths, continuous approximations, vehicle routing. (F) Daganzo, Newell

264B. Network Flows and Traffic Assignment. (1) Two 1-hour lectures per week for ½ of the semester. Prerequisites: 264A. Stationary vehicle flows on networks, conservation equations, traffic assignment, heuristics, structure of highway networks, time-dependent flows through bottlenecks. (F) Newell

264C. Logistics. (1) One 2-hour lecture per week for ½ of the semester. Prerequisites: 264A. Transportation/inventory/product cost interrelationships, physical distribution networks, systems modeling, the role of transhipment and terminals in logistic operations, system design. (F) Daganzo

265. Pavement Design and Rehabilitation. (3) Three 1-hour lectures per week. Prerequisites: Graduate standing in engineering. Theories, principles, and practices in the structural design, construction, and rehabilitation of pavements for streets, highways, airfields, and container transfer facilities; stabilization; pavement management; pavement evaluation; overlay design. (F) Bomberg

266. Marketing and Management of International Construction and Engineering. (2) Two 1½ hour lectures per week plus individual meetings with students. Prerequisites: Graduate standing in Engineering, Architecture, or Business School. Business development by engineers and contractors with emphasis on the international market. Development of skills in communication, contracts and negotiations. Management of international projects, including investigation, planning, procurement, contract administration, and accounting. Special problems of adverse environments. (SP) Gerrick

267A. Advanced Foundation and Mass Concrete Construction. (3) Two 1½ hour lectures per week. Prerequisites: 140 and 141. Evaluation of geotechnical, structural, and mechanical properties of soils, foundations for buildings, power plants, and underground structures such as subways. Excavation, bulkheading and shoring, piling, drilled shafts, dewatering, heavy concrete construction, underpinning. Integration of engineering and construction practices in urban environment. (F)

267B. Advanced Concrete Construction. (3) Two 1½ hour lectures per week. Prerequisites: 140. 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 building, bridge, tunnel, offshore, pressure vessels, and pollution control structures. (SP)

267C. Construction of Harbor, Coastal, and Ocean Structures. (3) Two 1½ hour lectures per week. Prerequisites: 140 and 141. Construction methods and equipment for construction of cofferdams, caissons, wharves, breakwater, outfall sewers, power plant intakes and discharges, submarine gas pipelines, dredging, offshore platforms, Arctic Ocean structures, sub sea and deep ocean facilities.

267D. Advanced Construction Field Techniques. (3) Two 1½ hour lectures per week. Three hour laboratory once every two weeks (in lieu of lecture). Prerequisites: 140 or consent of instructor. Advanced construction techniques for construction of bridges, high-rise office buildings, and structures in adverse environments. Production and handling of high strength concretes, erection of precast concrete structural elements, evaluation of high-performance concretes under water and slurry, and field repair of damaged structures. Lectures introduce alternative techniques and their limitations. In large sessions, study and practical applications techniques and evaluate their performance. (SP)

267E. Automation in Construction. (3) Two 1½ hour lectures per week. Prerequisites: 166 or equivalent. A survey of recent developments in the automation of construction processes. Emphasis on the combination of human, mechanical, and electronic resources to carry out construction work. Topics include human factors, office automation, prefabrication, on-site automation, and non-destructive evaluation. Approximate two-thirds of the lectures reviewed specific technology and applications to date; the remainder are devoted to in-class brainstorming and design sessions in support of the final project. (SP) Demesetz

268A. Advanced Construction Estimating. (3) Two 1½ hour lectures per week. Prerequisites: 166. Estimate used by heavy, engineering, building, and specialty contractors. Preparation of cost estimates including planning of methods and program evaluation of labor, material equipment, subcontract, and indirect costs; rational assessment of risk and profit margins. Value engineering. (F) Ibsb

268B. Construction Scheduling, Resource Allocation, and O.R. Applications. (3) Two 1½ hour lectures per week. Prerequisites: 166 or equivalent. Planning; scheduling and allocation of resources for construction projects; critical path methods; consideration of planning constraints and their impact on management; simulation methods and optimization techniques from an applications perspective. (SP) Crandall

268C. Essentials of Construction Project Control. (3) Two 1½ hour lectures per week: 268A and 268C (concurrently) or consent of instructor. Principles of engineering and construction project control. Accounting, and job cost, scheduling, and quality control issues addressed separately and as integrated systems. Scientific risk analysis considerations are introduced throughout the course. (SP) Ibsb

268D. Computer Applications in Construction. (3) Two 1½ hour lectures per week. Prerequisites: 166 or equivalent. Specific computer engineering and management problems. The presentation and use of commercial microcomputer packages in their solution is discussed in detail. Special attention is given to the selection and use of heavy construction equipment, cost and schedule control problems, and quality assurance techniques. (SP) Ibsb

268F. Project Risk Management. (3) Two 1½ hour lecture/discussion per week. Prerequisites: Graduate Civil Engineering standing or consent of instructor. This
subject will emphasize design and decision-making processes for both construction projects and firms involved in construction. Each of the four principal topic areas will include relevant theory and methodology as well as example applications. By focusing on risk and decision-making, the subject will develop state-of-the-art tools and strategies for project risk management. (F) Ashley

269. Asphalt Pavement Mixtures. (3) Three 1-hour lectures per week. Prerequisites: Graduate standing or consent of instructor. Advanced course concerned with asphalt pavement 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 paving structures; production, compaction, and recycling; and energy considerations. (SP) Monksmith

270A. Advanced Soil Mechanics. (3) Two 1-hour lectures per week. Prerequisites: 270A or consent of instructor. Advanced treatment of topics in foundation engineering, including earth pressure theories, retaining structures, bearing capacity, ground improvement for foundation support, analysis and design of shallow and deep foundations. (SP) Mitchell

270B. Advanced Foundation Engineering. (3) Two 1-hour lectures per week. Prerequisites: 270A or consent of instructor. Advanced treatment of topics in foundation engineering, including earth pressure theories, retaining structures, bearing capacity, ground improvement for foundation support, analysis and design of shallow and deep foundations. (SP) Mitchell

270L. Advanced Soil Mechanics Laboratory. (3) Three lectures and two 3-hour laboratory periods per week. Prerequisites: 270A, 270B (frist course), or consent of instructor. Lectures and experimental studies of advanced aspects of soil property measurement with application to analysis and design of retaining structures. (SP) Janbu

271. Soil Behavior. (3) Three 1-hour lectures and one 3-hour laboratory/demonstration per week. Prerequisites: Graduate standing or consent of instructor. Soil minirnization, soil component and composition, influence of geological factors on properties; colloidal phenomena in soils; soil structure; analysis of conduction phenomena; compressibility, strength, and deformation properties; stress-strain-time effects. (F) Mitchell

274. Introduction to Soil Dynamics. (3) Two 1-hour lectures per week. Prerequisites: Graduate standing or consent of instructor. Dynamic analysis of single and multi-degree-of-freedom systems. Wave propagation in viscoelastic media. Foundation vibrations. Seismic site response analysis. Introduction to seismic soil-structure interaction analysis. Dynamic soil properties and their determination. (F) Lysmer

275. Earthquake Geotechnical Engineering. (3) Two 1-hour lectures per week. Prerequisites: Gradate standing or consent of instructor. Earthquake waves; ground motion characteristics; relation of ground response using wave propagation analysis and finite element methods; causes of soil liquefaction and settlement; soil-structure interaction effects; lateral pressures on earth retaining structures; limitations of analysis of slope stability during earthquakes. (SP) Lysmer

276. Earth Structures. (2) Two 1-hour lectures per week. Soil compaction and soil stabilization using admixtures for use in embankments, dams, highways and other earth structures. Design of earth dam designs, construction, including siting, seepage control, stability evaluation; rockfill dams. (SP) Mitchell, Seed


280. Rock Mechanics. (3) Two 1-hour lectures per week, one field trip, and several laboratories. Prerequisites: 172. Engineering in discontinuous rocks; geological description and exploration; joint statistics; deformability and crack theory; rock thermal stability analysis; numerical analysis. (SP) Goodman

281. Engineering Geology. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: A course in physical Geology. Influence of geological origin and history on the engineering characteristics of soils and rocks. Application of geology in exploration, design, and construction of engineering works. (F) Goodman

283. Geological Engineering of Underground Openings. (3) Two 1-hour lectures per week. Prerequisites: Course in engineering geology or physical geology. Geological exploration for underground openings; methods of excavation, rock reinforcement, support, and lining; stability problems in hardrock, softrock, and soil tunneling; monitoring instrumentation; large openings for special purposes; case histories. (SP) Brajka

287. Adjunctive Computations. (2) Two 2-hour lectures per week. Prerequisites: 185 or consent of instructor. (SP) Statistics 25 or equivalent. Formally 289 and part of 287A. Review of matrix algebra and computer programming; introduction to probability and variance and covariance; derivation of the method of least squares adjustment with applications to problems in surveying; coordinate transformations with applications to coordinate refinement in analytical photogrammetry. (F) Anderson

288. Analytical Photogrammetry. (4) Two 2-hour lectures per week. Prerequisites: 180 or equivalent; 287 or equivalent. Comparator measurements; orientation matrices; analytical solutions for strips and blocks using coplanarly and collinearity conditions; constraints using auxiliary sensors; use of added parameters in the bundle adjustment. (SP) Anderson

289. Stereorestitution and Adjustment. (4) Three 1-hour lectures and one 3-hour laboratory per week. Prerequisites: Graduate standing or consent of instructor. Design of stereorestitution instruments; lateral, relative, and absolute orientation; map compilation; control extension by independent models; adjustment of control; random errors. (SP) Anderson

290A. Design Criteria for Marine Structures. (3) Two 1-hour lectures per week. Development of design criteria for design and re-qualification of marine structures (platforms, coastal facilities). Reliability and decision analysis uncertainties. Loading and structural design criteria for full-scale, life cycle design of structures. Rules of human and organizational error. Determination and communication of acceptable reliability characteristics. Also offered as IDS 293 and Naval Architecture 290C. (SP) Bea

290C. Computer-Aided Structural Engineering. (3) Three hours of lecture per week. Prerequisites: Background in structural analysis and design required, consent of instructor, and second year graduate standing. Advanced: algorithms and software design and analysis. Data abstraction methods of representing structures. Database models and systems. Fundamentals of geometric modeling and computer graphics. Engineer-computer interfaces. Techniques for developing computer-aided engineering systems. (F) Ferves


291. Numerical Methods in Hydraulic and Coastal Engineering. (3) Three 1-hour lectures and demonstration periods per week. Prerequisites: 100, Mathematics 50A and 50B. Introduction to numerical methods in hydrodynamics and in coastal and environmental hydraulic engineering. Multidimensional implicit equations, boundary value problems (elliptic partial differential equations) and initial value problems, parabolic and hyperbolic partial differential equations, applications in hydraulic and coastal engineering. (F) Sobei

292. Selected Topics in Air Transportation. (2) One 2-hour lecture per week. Prerequisites: Consent of instructor. Selected topics in the mathematical analysis of transportation systems. (SP) Halligan

292D. Advanced Topics in Geological Engineering. (1-2) May be repeated for credit up to 6 units each term. (SP) Geology 290R. Advanced Topics in Geological Engineering. Phonolite and related rocks. (SP) Geology 290S. Advanced in Groundwater. (3) Two 1-hour lectures per week. Prerequisites: Knowledge of soil mechanics or consent of instructor. Advanced treatment of topics in soil mechanics, including breakwaters, piers, fixed and mobile platforms. Corrosion prevention. Underwater inspections and repairs. Design, constraints, and criteria for steel and concrete, structures, piles and mat foundations. Also offered as IDS 292 and Naval Architecture 290E. (F) Halligan

293. Applications of Computer Systems to Engineering. (2) One 2-hour lecture per week. Prerequisites: Knowledge of computer systems. Computer systems currently employed for developing computer-aided engineering systems. Guidelines for use of computer-aided engineering systems. Database models and systems. Fundamentals of geometric modeling and computer graphics. Engineer-computer interfaces. Techniques for developing computer-aided engineering systems. (SP) Halligan

293A. Design, Construction, and Maintenance of Marine Structures. (3) Two 1-hour lectures per week. Equipment, procedures, and considerations associated with the construction, maintenance, and de-commissioning of coastal and offshore structures including breakwaters, piers, fixed and mobile platforms. Corrosion prevention. Underwater inspections and repairs. Design, constraints, and criteria for steel and concrete, structures, piles and mat foundations. Also offered as IDS 292 and Naval Architecture 290E. (F) Foreman

299. Advanced Construction Engineering. (3) Two 1-hour lectures/discussion per week. This course will cover the art and science of applying engineering and construction expertise from the working task level. Each week will focus on a 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) Halligan

299S. Advanced in Groundwater. (3) Two 1-hour lectures per week. Prerequisites: Consent of instructor. Recent applications or research in geological engineering and rock mechanics. Topics vary each term. (SP) Goodman

300. Transportation Planning for Developing Regions. (2) One 2-hour lecture per week. Prerequisites: Consent of instructor. The technique for, and the problems encountered in, conducting transportation planning studies in developing regions. Discussion of economic development, and the role played by transportation. Case studies of transportation planning in selected developing countries. (SP) Halligan

300D. Selected Topics in Air Transportation. (2) One 2-hour lecture per week. Prerequisites: 290D (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. (SP) Halligan

301A. Numerical Methods in Hydraulic and Coastal Engineering. (3) Three 1-hour lectures and demonstration periods per week. Prerequisites: 100, Mathematics 50A and 50B. Introduction to numerical methods in hydrodynamics and in coastal and environmental hydraulic engineering. Multidimensional implicit equations, boundary value problems (elliptic partial differential equations) and initial value problems, parabolic and hyperbolic partial differential equations, applications in hydraulic and coastal engineering. (F) Sobei
291C. Advanced Hydrodynamics. (3) Three 1-hour lectures per week. Prerequisites: 100. Flow kinematics, strain and vorticity, stress tensor, Navier-Stokes Equations, exact solutions to Navier-Stokes Equations, High Reynolds Number flow-boundary-layer, overset meshes, turbulence development, wakes and plumes, open channel flows. (F) Foda

291D. Environmental River Mechanics and River Engineering. (3) Three hours of lecture per week. (Some fields of study) Prerequisites: 207. Major topics are: mechanics of river formation and development, stable channel design with and without hydraulic structures, reservoir sedimentation, sedimentation problems at river mouths, and the mathematical modeling of alluvial rivers (including degradation and aggradation). Alternative engineering solutions according to river behavior analysis and certain biological concerns will be discussed. (SP) Shen

298. Group Studies, Seminars, or Group Research. (1-6) May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Research or investigation in selected advanced subjects. (F,S,P) 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,S,P) Staff

602. Individual Study for Doctoral Students. (1-6) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare for the various examinations required of candidates for doctoral degrees. May not be used for unit or residence requirements. (F,S,P) Staff

Professional Courses

301. Workshop for Future Civil Engineering Teachers. (1-3) Three 2-hour meetings per week. May be repeated for credit. Two hours lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Teaching assistant or graduate student status. The course will include supervised teaching of laboratory sections of civil engineering courses, group analysis of videotapes, reciprocal classroom visits, and an individual project. (F,S,P) Staff

Classics

(College of Letters and Science)

Department Office: 5303 Dwinelle Hall, 642-4218
Chair: Mark Griffith, Ph.D.

Professors:

John K. Anderson, M.A., F.S.A. Oxford University. Greek and Roman art and archaeology

William S. Anderson, Ph.D. Yale University. Latin literature, language, and religion

Crawford H. Greenway, Jr., Ph.D. University of Pennsylvania. Greek and Roman art and archaeology

Robert C. Knapp, Ph.D. University of Pennsylvania. Roman History

Professor. Anthropology

Anthony A. Long, Ph.D. University of London. Ancient and Medieval literature and Greek and Latin literature

Donald J. Mastronarde, Ph.D. University of Toronto. Greek and Latin literature

Stephan G. Miller, Ph.D. Princeton University. Greek and Roman art and archaeology (Graduate Advisor, Classical Archaeology)

Charles E. Murgia, Ph.D. Harvard University. Latin literature and textual criticism

Michael N. Nagler, Ph.D. University of California at Berkeley. Greek and Latin literature

Ronald S. Stroud, Ph.D. University of California at Berkeley. Greek history

Leslie L. Threatte, Ph.D. Harvard University. Greek epigraphy, literature, and comparative linguistics

W. Kendrick Pritchett, Ph.D. Ancient History

Thomas G. Rosenmeyer, Ph.D. (Emeritus)

Associate Professors:

G.R.F. (John) Ferreri, Ph.D. Cambridge University. Ancient philosophy and language

Thomas N. Habinek, Ph.D. Harvard University. Latin literature, ancient history (Graduate Advisor, Classics)

Florence Verdugu, Ph.D. University of California at Berkeley. Latin literature

W. Gerson Rabinowitz, Ph.D. (Emeritus)

Assistant Professor:

Leslie V. Kurha, Ph.D. Princeton University. Greek literature

Visiting Assistant Professor:

W. Martin Bloomer, Ph.D. Yale University. Ancient history and Latin literature

Sather Professor:

Glen Bowensick (Fall)

Major Advisers: (Greek, Latin, Classical Languages, Classical Civilization) Mr. Knapp, Mr. Marschner

Major Graduate Advisers: (Classics) Mr. Habinek; (Classical Archaeology) Mr. Miller

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 course 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 institutions. The latter courses require no knowledge of Greek and Latin. The 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 Civilization.

Major in Greek. Elementary Greek (either Greek 1-2 or Greek 10 or the Greek Workshop, offered during Summer Session); Greek 40 (to be completed as early as possible; may be taken concurrently with upper division courses); Greek 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 upper division courses.

Major in Classical Civilization. An area of concentration must be chosen in either Greek or Roman Civilization. Greek Civilization: elementary Greek (either Greek 1-2 or Greek 10 or the Greek Workshop, offered during the Summer Session); Greek 2B, 101, and 102. Roman Civilization: elementary Latin (either Latin 1-2 or Latin 14-2 or Latin 10 or the Latin Workshop, offered during Summer Session); Latin 100, 101, and 102. Both concentrations: three additional lower division courses (Classics, Greek, or Latin of which two will normally be Classics 10A-10B, to be completed, if possible, by the end of junior year; under exceptional circumstances, the undergraduate adviser may authorize substitution of Classics 10A for 10B, or 100B for 10B); any four additional upper division courses in Classics, Greek, or Latin in related fields (from the list of recommended courses).

Recommended upper division courses for majors: advanced courses in Classical Languages courses in Classics; Sanskrit (see South and Southeast Asian Studies); Art 140 (Aegean Art); Art 141A-141B (Greek Art); Art 141D (Studies in Greek Art); Art History 145 (Roman Art); Dramatic Art 122 (Theatre in Greece and Rome); History 107A-107B-107C (Topics in Ancient History); History 108 (Byzantium); Near Eastern Studies 132 (Judaism and Hebrew); Philosophy 160 (Plato), Philosophy 161 (Aristotle); Political Science 112B (History of Political Thought); Rhetoric 100 (Rhetorical Tradition); Rhetoric 130 (Political Rhetoric). Undergraduates are also urged to enroll in Greek or Latin Advanced Prose Composition, Classics 250 (Greek), 260 (Latin), and count units from these courses as elective or additional upper division units within their major program.

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.

Honor Program. Restricted to majors with an overall University GPA of at least 3.3 and a GPA of at least 3.5 in the major. Consists of (a) one of the major programs, with the addition of or including at least one Senior Reading course in Greek or Latin poetry and one Senior Reading course in Greek or Latin prose (Greek for Greek majors, Latin for Latin majors); (b) two semesters of H195 (Greek 195 for Greek majors, Latin 195 for Latin majors, either course for Classical Languages or Classical Civilization majors), to be taken in the last two semesters preceding graduation. H195 consists of largely independent study over two semesters, including the writing of a thesis, which will be evaluated by an Honors Committee of three majors. The written thesis is due on Monday of the 13th week of the second semester and the committee will agree upon the level of Honors (Honors, High Honors, or Highest Honors) and the grade to be awarded no later than the Monday of examination week.

The Minors

The Department of Classics offers three undergraduate minors: Greek, Latin, and Classical Civilization.

Minor in Greek. Five courses from Greek 100, 101, 102, 105, 115-123.

Minor in Latin. Five courses from Latin 100, 101, 102, 115-123, 140, 155.
Minor In Classical Civilization. Five courses from Classics 100A, 100B, 120, 121, 122, 130, 155A, 155B, 170, 175, 178, 180, Greek 100-102, 105, 115-123, Latin 100-102, 115-123, 140, 155.

Intercollegiate Center for Classical Studies in Rome. There will be an opportunity for some Classical major to attend the Intercollegiate Classical Center in Rome. This is an intercollegiate program for undergraduates in Classics. All students interested in this program should consult the major advisor.

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 reading knowledge of French and German, since they may be required 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 Civilization 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 graduate students' principal interest—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 literature, history, and philosophy. They are also encouraged to enter courses in epigraphy, comparative grammar, and Greek dialects when they are offered, since the interval between offerings of each is at least three years. The graduate course offerings are varied from year to year so that in a normal period of graduate study students may take courses in several fields and periods. Service for two semesters as a graduate student instructor in Classics is normally required as part of the Ph.D. program in Classics. Most seminars may be taken for either 4 units (for a letter grade) or 2 units (on a satisfactory-un satisfactory basis), subject to some restrictions. For details of the M.A. and Ph.D. programs consult the graduate adviser.

Undergraduate Courses

Courses that do not require a knowledge of Greek or Latin. Courses in this group are designated Classics 10A, 10B, etc.

Lower Division Courses

10A. The Golden Age of Greece. (4) Three 1-hour lectures and one 1-hour discussion per week. Translations of the Greek classics studied in their political and social settings will illustrate the achievements of the Greeks in literature, philosophy, history, and art. (F,SP) Gehrig

10B. The Golden Age of Rome. (4) Three 1-hour lecture and one 1-hour discussion per week. Prerequisites: 10A is not prerequisite to 10B. Translations of the Latin classics studied in their political and social settings will illustrate the achievements of the Romans in literature, history, and art. (SP) Knapp

17A. Introduction to the Archaeology of the Greek World. (4) Three 1-hour lectures and one 1-hour discussion per week. The physical remains of the Greek world from the Bronze Age to 323 B.C. will be studied, with emphasis on its artistic triumphs, as a means of understanding the culture of ancient Greece. (F)

17B. Introduction to the Archaeology of the Roman World. (4) Three 1-hour lectures and one 1-hour discussion per week. The physical remains of the Greek world from the Bronze Age to 323 B.C. will be studied, with emphasis on its artistic triumphs, as a means of understanding the culture of ancient Greece. (F)

28. The Classic Myths. (4) Three hours of lecture and one 1-hour discussion per week. A study of Greek and Roman myths with emphasis on the universal meanings of myths. The interaction of myths, religion and philosophy as a source of understanding of ancient and present cultures. (F) Nagler

34. Epic Poetry: Homer and Virgil. (4) Three 1-hour lecture and one 1-hour discussion per week. Greek and Roman epics with reading of the Iliad, Odyssey, Aeneid. (SP)

35. Greek Tragedy. (4) Three hours of lecture per week. Greek tragedy with readings of Aeschylus, Sophocles, and Euripides.

36. Greek Philosophy. (4) Three hours of lecture per week. Introduction to the philosophies of Socrates, Plato and Aristotle. (SP) Ferrari

38. Freshman Seminar. (4) Two 1½-hour classes per week. Prerequisites: Freshman or Sophomore status and permission of instructor. Intensive study of a major area or theme of classical literature or of a major aspect of classical civilization, including the influence and interpretation of the classics in later traditions. (SP) Staff

98. Directed Group Study for Freshmen and Sophomores. (1-4) 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) 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. (3) Three hours of lecture per week. Readings in Greek writers at the upper division level. (F,SP)

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 1-hour lectures per week. Prerequisites: Greek 2 or 10. The principles of ancient metre of all types.

121. Greek and Roman Religion. (4) Three hours of lecture per week. Formerly Classics 122. Study of the worship of the gods in the ancient Greek world; cult practices and religious ideas. History and development of Roman religion. (SP) Bullock

130. Topics in Ancient Greek and Roman Culture. (4) Course may be repeated for credit. One 3-hour or two 1½-hour seminars 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. (F) Ferrar

155A-155B. Late Antiquity. (4,4) Three hours of lecture per week. (F,SP)

A. Society and the Supernatural from Marcus Aurelius to Symeon Stylites.

B. The strains of empire. The Roman world 200-550 A.D.

170. Classical Archaeology. Three hours of class per week.

170A. Greek Vase Painting. (4)

170B. Greek Sculpture to 400 B.C. (4) (SP) JK Anderson

170C. Greek Architecture. (4)

170D. Roman Art and Architecture. (4)

175. Topography and Monuments. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. (F)

175A. Athens. (4)

175B. Rome. (4) (F) JK Anderson

175C. Sanctuaries of Greece. (4) (SP) Miller

175D. Pompeii and Herculaneum. (4)

175E. The Western Roman Provinces. (4)

175F. Roman Wall Painting. (4)

178. Mythology. (4) Three hours of lecture per week. Investigations into the significance of myths, based on Greek myths and selected Near Eastern and Indo-European parallels. (F,SP)

180. Ancient Athletics. (3) Three hours lectures per week. Study of ancient athletics and athletics including athletic training, facilities, competitions, and the role of athletics in Greek and Roman society.

198. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Restricted to senior honor students. (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. Prerequisites: Restricted to senior honor students. (F,SP)

Greek Courses in this group are designated Greek 1, 2, etc.

Lower Division Courses

1. Elementary Greek. (4) Three 1-hour lectures per week. Beginners' course. (SP) Stroud (F); Staff (SP)

2. Elementary Greek. (4) Three 1-hour lectures per week. Beginners' course. (F,SP) Staff (F,SP)

10. Intensive Elementary Greek. (5) Five 1-hour lectures per week. Beginners' course (Intensive); equivalent to Greek 1-2. (SP) Maistorarade

10. Intermediate Greek Prose Composition. (4) Three 1-hour lectures per week. Prerequisites: 2, 10, or 15. Formerly Greek 40A. Development of skills in writing Attic prose and reading; grammar review. (SP) Threarte

98. Directed Group Study for Freshmen and Sophomores. (1-4) Must be taken on a passed/not passed basis. Prerequisites: Restricted to freshmen and sophomores; consent of instructor; 3.3 overall GPA. (F,SP)

99. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: *2

*Offered 1989-92

*On leave, spring

*On leave, fall

*Recipient of Distinguished Teaching Award

*On leave, spring

*Recalled to active service

*Offered 1989-92

*On leave, spring
Restricted to freshmen and sophomores; consent of instructor; 3.3 overall GPA. (F,SP)

Upper Division Courses

100. Plato and Attic Prose. (4) Three hours of lecture per week. Prerequisites: 2, 10, or 15. Readings from Plato's Apology or Crito, and from other Attic prose authors (e.g., Xenophon, Lysias); some review of grammar. (F) Ferrari

101. Homer. (4) Three hours of lecture per week. Prerequisites: 100. Formerly Greek 102. Reading of one Greek tragedy, and of further selections from the dramatists and/or prose literature of fifth century Athens. (F)

*105. The Greek New Testament. (4) Three hours of lecture per week. Prerequisites: Greek 101 or 102. Readings in the Gospels and/or Acts and/or Epistles.

115. Archaic Poetry. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 101 or 102. Readings in various Greek poets. (SP) Kurke

*116. Greek Drama. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 101 or 102. Selected readings from Greek tragedy and/or comedy.

117. Hellenistic Poets. (4) Course may be repeated with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 101 or 102. Readings in various Hellenistic poets. (F) Bolluck

*120. Herodotus. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 100 or 102 or 105. Readings in Herodotus.

*121. Thucydides. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 100 and either 101 or 102 or 105. Readings in Thucydides.

122. Attic Oratory. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 100 and either 101 or 102 or 105. Readings in oratory. (F) Stroud

*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.

H195A-H195B. Honors Course in Greek. (3,3) Credit and grade to be awarded upon completion of the sequence. Prerequisites: Appropriate language preparation and eligibility for admission to the honors program. Largely independent study over two semesters, including the writing of a thesis, to be evaluated by an Honors Committee of three members. Written thesis due Monday of the 13th week of the second semester. (F,SP)

100. Latin. (4) Three 1-hour lectures per week. Beginners' course. (F,SP) Knapp, Staff

2. Elementary Latin. (4) Three 1-hour lectures per week. Prerequisites: 1, 14 or equivalent. Beginners' course. (F,SP)

10. Intensive Elementary Latin. (8) Five 1-hour classes and one hour of discussion per week. Beginners' course (intensive); equivalent to Latin 1-2. (F,SP)


40. Intermediate Latin Prose Composition. (4) Three 1-hour lectures per week. Prerequisites: 2, 10, or 15. Formerly Latin 40A. Development of skills in writing Latin prose and sight reading; review of grammar. (F)

98. Directed Group Study for Freshmen and Sophomores. (1-4) 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) Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor; 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 Catullus and Cicero; some review of grammar. (F,SP)

101. Vergil. (4) Three hours of lecture per week. Prerequisites: 100. Selected readings from Vergil. (SP) Anderson (F); Bolluch (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) Anderson

*115. Roman Drama. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 101 or 102. Readings in Comedy (Plautus and/or Terence) and Tragedy (Seneca).

*116. Lucretsius, Vergili'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 Georgics; this requirement does not apply to the honors program.

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) Bolluck

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. (SP) Anderson

*119. Latin Epic. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 101 or 102. Readings in Latin epic poetry.

*120. Livy. (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 Livy.

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) Knapp

*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 Tacitus, Pliny, and other prose writers.

*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.

140. Medieval Latin. (4) Three hours of lecture per week. Prerequisites: 100. Introduction to medieval Latin: readings in prose and poetry from Casiodorus to the Italian Renaissance, with emphasis on certain periods. (SP) Threatte

*155A-155B. Latin of the Fourth and Fifth Centuries. (4,4) Three hours of lecture per week. Prerequisites: 101 or 102.

A. Readings in fourth and fifth century prose.

B. Readings in fourth and fifth century poetry.

H195A-H195B. Honors Course in Latin. (3,3) Credit and grade to be awarded upon completion of the sequence. Prerequisites: Appropriate language preparation and eligibility for admission to the honors program. Largely independent study over two semesters, including the writing of a thesis, to be evaluated by an Honors Committee of three members. Written thesis due Monday of the 13th week of the second semester. (F,SP)

197. Field-Studies. (2-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Supervised field programs involving experiences in schools and school-related activities. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

198. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Restricted to senior honor students. (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. Prerequisites: Restricted to senior honor students. (F,SP)

Graduate Courses

Classics

The prosemaker (Classics 200) is prerequisite to all graduate seminars; this requirement does not apply to graduate courses that are not seminars proper (namely, Classics 210A-201B, 202A-202B, 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. Pro-Seminar. (4) Two 1½-hour or one 3-hour class per week. An introduction to the general literature of classical philology, to research, and to textual criticism. (F) Mastronarde

201A-201B. Survey of Greek Literature. (4,4) Two 1½-hour classes per week. A sequence of readings and lectures on Greek literature. (F,SP) Mastronarde (F); Griffith (SP)


203. Approaches to Classical Literature. (4) Two 1½-hour seminars 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. (SP) Hablek

*210. Greek Hexameter Poetry. (2,4) Course may be repeated for credit as topic varies. Two 1½-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 210A-B. Homer, Hesiod, or other topics in hexameter poetry.

211. Archaic Greek Poetry. (2,4) Course may be repeated for credit as topic varies. Two 1½-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly

Latin

Courses in this group are designated Latin 1, 2, 40, etc.

Lower Division Courses

1. Elementary Latin. (4) Three 1-hour lectures per week. Beginners' course. (F,SP) Knapp, Staff
210C-D. Topics in iambic, elegiac, and lyric poets from Archilochus to Pindar. (F)

*213. Hellenistic Poetry. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 210E. Study of Callimachus, Theocritus, Apollonius, or other topics in Hellenistic poetry and poetry.

214. Greek Drama. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 215A-E. Study of Aeschylus, Sophocles, Euripides, Aristophanes, Menander, or other topics in Greek drama and dramatic theory. (SP) Mastromarino

216. Greek Historians. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 215A-E. Study of Herodotus, Thucydides, Aristotle (Constitution of Athens), or other topics in the Greek historians or historiography. (F,SP) Kurke (F); Stroud (SP)

*217. Greek Oratory and Rhetoric. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour class per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 215A-D. Study of Plato, Aristotle, Hellenistic philosophy, or other topics in ancient Greek philosophy through Plotinus. (SP) Ferrari

*219. Ancient Novel. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Study of Greek novelists, Petronius, Apuleius, or other topics in Greek or Roman romance or novel.

220A-220B. Greek and Latin Epigraphy. (2,4,2) Two 1/2-hour or one 3-hour class per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter basis. Prerequisites: 200. A. Formerly 214. Greek epigraphy

B. Formerly 240. Latin epigraphy

*221. Greek Psychology. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour lectures per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Ancient reflections on the soul, consciousness, and various aspects of mental life, especially constructs of the self.

*222. Introduction to Comparative Grammar of Greek and Latin. (2,4) Two 1/2-hour lectures per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Ancient reflections on the soul, consciousness, and various aspects of mental life, especially constructs of the self.

*223. Advanced Topics in Comparative Grammar of Greek and Latin. (2,4) Two 1/2-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 222. Advanced topics in comparative grammar of Greek and Latin.

*224. Classical Poetics and Rhetoric. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour lecture per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Ancient views of literature; theories and practice of criticism, scholarship, and education, from Homer to Byzantium.

*228. Ancient Society and Law. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 238. Study of social, legal, or administrative structures of the Greek city-state. (SP) Oleson

*229. Ancient Religion. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Study of cults and rituals in relation 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. Two 1/2-hour or one 3-hour class per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Former 230A-G. Study of Lucretius, Vergil, Horace, Ovid, or other topics in Latin poetry through the Augustan period. (SP) Verdier

232. Roman Drama. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 232A-C. Study of Plautus, Terence, Seneca, or other topics in Roman drama. (SP) WS Anderson

234. Roman Historians. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 234A-E. Study of Caesar, Sallust, Livy, Tacitus, or other topics in Roman history or historiography. (F) Bowersock

*235. Latin Philosophers. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 234A-E. 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. Two 1/2-hour or one 3-hour class per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 236A-C. Study of Quintus, Terence, Seneca, or other topics in Latin oratory and rhetoric. (F) Habinek

237. Latin Epitaphiology. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour class per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 237A. Study of clayware, quadran, or other topics in Latin epitaphiology. (SP) Murgia

*239. Roman Politics and Administration. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Select problems in Roman imperial history from 69-235 A.D.

*240. Greek and Roman Literature 100-500 A.D. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 245A-B. Topics in Latin literature from the period 500-1300.

*242. Topics in Byzantine Literature, History, and Culture. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter grade basis. Prerequisites: 200. Formerly 240. Topics in Byzantine literature, history and culture.

250. Advanced Greek Composition. (4) Course may be repeated for credit. Two 1/2-hour or one 3-hour class per week. Prerequisites: Greek 40 or equivalent. Advanced instruction in the writing of Greek prose. (F) Bulloch

*251. Greek Dialectics. (2,4) One 2-hour or one 1/2-hour per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter basis. Prerequisites: Graduate status or permission of instructor. The emphasis will be on epigraphical rather than literary texts. Among topics included will be introduction to study of dialogic forms, relationships of these forms to other discourses, and development of the dialects in postclassical times.

260. Advanced Latin Composition. (4) Course may be repeated for credit. Two 1/2-hour or one 3-hour class per week. Prerequisites: Latin 40 or equivalent. Advanced instruction in the writing of Latin prose. (SP) Habinek

270. Seminar in Classical Archaeology. (2,4) Course may be repeated for credit as topic varies. Two 1/2-hour or one 3-hour lecture per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter basis. Study of the Pan-Hellenic centers with particular emphasis on Nemea. (SP) Miller

277. Field Study in Archaeology. (2,4) Course may be repeated for credit up to a maximum of fifteen 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 Ph.D. degree. Normally reserved for students writing the doctoral dissertation. (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 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 for the comprehensive or language requirements in consultation with the graduate advisor. Units may not be used to meet either 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 lectures and one 3-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or TA status. Seminar in
problems 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 division Latin courses or discussion sections in Classics. Two semesters normally required for Ph.D. candidates. (F,SP)

Related Courses in Other Departments
For courses in Sanskrit, see Department of South and Southeast Asian Studies; for courses in modern Greek, see Department of Comparative Literature.

Cognitive Science
(College of Letters and Science)
A group major in cognitive science studies has been approved by the College of Letters and Science for 1991-92. However, the California Post-Secondary Education Commission reviews all new major programs, and its final determination regarding the new group major had not been made at press time.

Cognitive science is the cross-disciplinary study of the structure and processes of human cognition and their computational simulation or modeling. This interdisciplinary major will be 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 will draw on relevant courses found within the departments of Anthropology, Education, Computer Science, Linguistics, Philosophy, and Psychology, as well as specially designed lower and upper division courses in cognitive science.

Students interested in the major should consult the Division of Undergraduate and Interdisciplinary Studies, 301 Campbell Hall, 642-6984.

Lower Division Courses
1. Introduction to Cognitive Science. (3) One 2-hour lecture and one 3-hour laboratory per week. This course is an introduction to the interdisciplinary field of cognitive science. Lectures and readings will survey research from artificial intelligence, psychology, linguistics, philosophy, neuroscience, and will cover topics such as the nature of knowledge, thinking, remembering, vision, imagery, language, and consciousness. Sections will demonstrate the new major to traditional students.

2. Perception. (3) One 3-hour laboratory per week. Prerequisites: Undergraduate major or minor in Psychology. This course provides an overview of research on human and animal perception, with a focus on visual perception.

3. Language and Thought. (3) One 3-hour lecture and one 3-hour laboratory per week. Prerequisites: Undergraduate major or minor in Psychology. This course examines the relationship between language and thought, with a focus on how language influences cognitive processes.

4. Evolutionary Psychology. (3) One 3-hour lecture and one 3-hour laboratory per week. Prerequisites: Undergraduate major or minor in Psychology. This course explores the evolutionary basis of human behavior and cognition.

5. Cognitive Development. (3) One 3-hour lecture and one 3-hour laboratory per week. Prerequisites: Undergraduate major or minor in Psychology. This course examines the cognitive development of children from infancy to adulthood.

6. Social Cognition. (3) One 3-hour lecture and one 3-hour laboratory per week. Prerequisites: Undergraduate major or minor in Psychology. This course explores the cognitive processes involved in social interaction and cooperation.

7. Artificial Intelligence. (3) One 3-hour lecture and one 3-hour laboratory per week. Prerequisites: Undergraduate major or minor in Computer Science. This course introduces the concepts and techniques of artificial intelligence.

Comparative Literature
(College of Letters and Science)
Department Office: 4408 Dwinnell Hall, 642-1200
Chair: Francesco Maisolo, Ph.D.

Graduate Advisers: Ms. Amy, Mr. Neillands, Mr. Sensabaugh.

The interdisciplinary Graduate Group in Comparative Literature addresses the M.A. 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, Molecular Plant Biology, Chemistry, Entomological Sciences, Biomedical and Environmental Health Sciences, and research units such as the Cellular and Molecular Biology Laboratory and Lawrence Berkeley Laboratory.

Comparative Literature 41 series (Introduction to Literary Forms)
Two semesters of 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 for that program (see 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 for that program (see below).

Requirements: Upper Division. A minimum of 30 approved upper division units in literature, including (1) CL 100 in the junior year, a section of CL 190 in the senior year, and one Comparative Literature upper division literature course period course (the 151-155 series), the course to be chosen to fit the period of the student's work in the minor literature, (2) at least four courses totaling not fewer than 12 units in one literature read in the original language and with emphasis on the classic works of that literature, (3) at least two courses totaling not fewer than six units in any other literature read in the original language, and (4) at least one upper division course in a classical literature, where works are read in translation or in the original from Greek, Latin, Classical Arabic, Biblical Hebrew, Sanskrit, or Classical Chinese. Note that, although only two literatures (for example, English-French) are required for the A.B. degree, adequately prepared students, especially those contemplating graduate work, may find it advantageous to work in three literatures.

Requirements: Honors. Students who have attained junior standing may be honored or if they (1) have accumulated at least an overall 3.0 grade-point average and at least a 3.3 grade-point average in courses in the major, and at the time of graduation have accumulated at least a 3.51 grade-point average in the major and a 3.3 average in all work completed at the University, have completed at least 12 upper division units in literature, including Comparative Literature 100 or the equivalent; and (3) are prepared
to do upper division work in one vernacular foreign literature and in one classical literature.

In addition to the requirements for the regular program outlined above, candidates for the A.B. with honors in Comparative Literature must (1) complete one upper division course in a classical literature in the original, (2) complete at least one upper division course in a vernacular foreign literature, (3) demonstrate, through either examination or course work, a sense of the historical development of their principal literature, and (3) earn a grade of B or higher for the writing of an honors thesis in Comparative Literature H195. Students interested in the program are urged to consult an adviser in the Department of Comparative Literature at their earliest opportunity.

Modern Greek

See 112A (Modern Greek language), 112B (Modern Greek composition). In addition, independent study topics under courses 170, 199, and 298 can be arranged with the instructor of 112A-112B to continue the study of modern Greek language and literature.

The Graduate Program

Students are ordinarily admitted for postbacalaureate work leading to the Ph.D. degree. This degree prepares students for teaching and research in modern and classical literature, and is especially designed to encourage interdisciplinary research involving the study of literary and theoretical documents in several languages. The program is composed of two parts and is designed to provide students with the maximum of flexibility compatible with a rigorous course of study. During the first two years of work, emphasis is placed on the comprehension and critical coverage of one literature and on the study of a minor literature in one area. In subsequent years, students design an individual program of study involving three literatures. Additional information concerning the program should be sought from the vice chair in charge of graduate studies in the Department of Comparative Literature.

Undergraduate Preparation. Students interested in the graduate program in comparative literature at Berkeley are advised that strong undergraduate preparation in at least two foreign languages will speed up their work at the graduate level. A reading knowledge of one classical language is required for the Ph.D.

Requirements for the M.A. Degree. A minimum of 24 approved graduate and upper division units including (1) at least 12 graduate units in comparative literature, and (2) work in at least two separate ancient or modern literatures (for example, English and Italian). The department does not specify courses required for the M.A. but advises students to follow the program of study that will best assist them in preparation for the M.A. written and oral examinations, to be taken not later than the third year of study. The M.A. examination is based on a series of primary and secondary texts selected by the student in consultation with an adviser.

Requirements for the Ph.D. Degree. A total of 11 graduate courses is required for the Ph.D. degree, counted cumulatively from the beginning of graduate study at Berkeley. (Students entering with M.A.'s from other institutions will be required to demonstrate preparation equivalent to that of the Berkeley Comparative Literature program.) Courses include Introduction to Comparative Literature, as well as graduate-level courses in the major and each of two minor literatures. These are intended to provide students for the Ph.D. written qualifying examinations, which examine the three literatures in a comparative context according to diachronic and synchronic lines. They are based on reading lists and a statement of interest drawn up by the student in consultation with an adviser. Students are expected to complete these examinations not later than the fourth year of study and to devote the following two years to the development of a prospectus and the completion of a doctoral dissertation. Dissertation committees are ordinarily composed 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

1A-1B. English Composition in Connection with the Reading of World Literature. (4,4) Three 1-hour lectures per week plus individual conferences. Prerequisites: Subject A examination or course. 1A or equivalent is prerequisite to 1B. Expository writing based on selection of selected masterpieces of ancient and modern literature. (F,SP)

1AC. English Composition in Connection with the Reading of World Literature. (5) Three 1½ hours lecture and individual conferences per week. Prerequisites: Three years of high school English or two years with a B plus average. Expository writing based on analysis of selected masterpieces of ancient and modern literature, additional readings and writing addressing the nature and function of an essay. A combined course in which a grade of C or higher fulfills both Subject A and first half of the R&Cs requirements. Six work units in computation of study list. (F,SP)

H1A-H1B. English Composition in Connection with the Reading of World Literature. (4,4) Three 1-hour discussion and individual conferences. Prerequisites: (a) Subject A examination, (b) a 3.5 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, who meet for round-table discussions and attend weekly tutorial and class assignments providing each student the opportunity to exploit his or her linguistic and literary training. (F,SP)

2A-2B. English Composition in Connection with Reading of World and French Lit. (5,5) Five 1-hour meetings per week. Prerequisites: Three years of high school French or two years with a B plus average. 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 work suitable for students for more advanced work in French. (F,SP)

25A-25B. Introduction to Film History. (4,4) Three 1-hour classes and one 4-hour screening per week. The development of cinema as a dominant form of representation in contemporary culture. A study of major aspects of the cinematographic apparatus illustrated by a survey of the early cinema and the development of major film genres. A. World cinema from 1880 to 1934. B. Major types of filmic discourse from 1934 to 1970. A. World cinema from 1880 to 1934. B. Major types of filmic discourse from 1934 to 1970.

30A. Seminar in World Literature. (3-8) Two ½-hour discussions per week. Prerequisites: Consent of the instructor. Exploration, in seminar format, of a topic in World Literature at the chosen depth and individual assignments. Limited to 15 students with freshman standing. (F,SP)

30B-30C. Seminar in World Literature. (3,3) Two ½-hour discussions per week. Prerequisites: Consent of the instructor. Exploration, in seminar format, of a topic in World Literature at the chosen depth and individual assignments. Limited to 15 students with freshman standing. (F,SP)

40. Women and Literature. (3-4) May be repeated once for credit as topic varies. Three 1-hour lectures per week. A study of women as portrayed in literature, and of the major changes in written representations of women which vary from semester to semester, with detailed consideration of both literary techniques and the problems of women. (F,SP)

41. Introduction to Literary Forms. (3) Two 1½-hour lectures per week. Comparative study of masterpieces of world literature. (F,SP)

41A. Forms of the Epic. (3) (SP) Diman

41B. Forms of the Lyric. (3)

41C. Forms of the Novel. (3)

41D. Forms of the Drama. (3)

56. Money, Property and Responsibility in American Cultures. (3) Three 1-hour lectures per week. An investigation of the standards of material and social success formulated by various ethnic groups and subcultures in the United States. Course work will combine an analysis of literary texts with a study of the history of immigration and of consumer culture. Lectures and discussions will focus on the borders of racism and classism. (F) Davis

Upper Division Courses

100. Introduction to Comparative Literature. (3) Three 1-hour lectures per week. Prerequisites: One upper division literature course in a foreign language or consent of the instructor. Selected literary, critical, and theoretical texts from classical antiquity to the present, read in English and one foreign language. Emphasis on principles of comparative methods and analysis. (F,SP) Roncel, Nagler

112A-112B. Modern Greek Language and Modern Greek Composition. (4,4) Three 1-hour lectures and one 1-hour conference per week. Prerequisites: Two years high school Greek or two years with a B plus average. Modern Greek pronunciation, vocabulary, grammar and syntax studied. The forms of writing (prose, poetry, drama) and the reading of literary texts as auxiliary to the acquisition of composition skills. (F,SP) Kozanamandou

120. The Biblical Tradition in Western Literature. (3) Three 1-hour lectures per week. Examination of selected aspects of the Biblical tradition and their relevance to the study of later literature.

125. The Mystical Tradition in Literature. (3) A modern approach to the mystical tradition in literature. A survey of the major mystical movements and their expression in literary form. Examples drawn from at least one Eastern and one Western tradition; emphasis on problems such as love and sex, social justice and individual fulfillment.

151. The Ancient Mediterranean World. (3) Three 1-hour lectures per week. Prerequisites: Upper division standing or permission of the instructor. Literature of Greece, Rome, the Biblical lands, and other ancient civilizations of the Mediterranean basin.

152. The Middle Ages. (3) Three 1-hour lectures per week. Prerequisites: Upper division standing or permission of the instructor. Graduate students wishing to enroll must know at least one foreign language relevant to the materials studied. The literature of the European Middle Ages. (F) Spohr

153. The Renaissance. (3) Three 1-hour lectures per week. Prerequisites: Upper division standing or permission of the instructor. Prerequisites: Upper division standing or permission of the instructor. Graduate students wishing to enroll must know at least one foreign language relevant to the materials studied. European literature of the Renaissance.

154. Enlightenment and Romanticism. (3) Three 1-hour lectures per week. Prerequisites: Upper division standing or permission of the instructor. Graduate students wishing to enroll must know at least one foreign language relevant to the materials studied. European literature of the eighteenth and nineteenth centuries and of the Romantic period. (F) Lucey

155. The Modern Period. (3) Three 1-hour lectures per week. Prerequisites: Upper division standing or permission of the instructor. Graduate students wishing to enroll must know at least one foreign language relevant to the materials studied. Literature of the nineteenth and twentieth centuries. (SP) After

156. Fiction of the Americas. (3) Three 1-hour lectures per week. Comparative study of recent American, Native-American, Spanish-American, and Brazilian
ian fiction. Readings chosen to illustrate diverse atti
tudes of Americans toward their Western Hemisphere
environment.
159. Modern Literature and the Arts. (4) Three
1-hour lecture and discussion and three 1-hour labora
tory periods per week. Prerequisites: Three semesters of
one foreign language and two semesters of lower or
upper division literature. Comparative investigation of
the interrelationships between modern poetry and fic
tion and modern painting, sculpture, music, and film,
with particular emphasis on the period from 1885 to
the present. Discussion of the methods used in this type
of comparative analysis.
160. Western Literary Cross Currents in Twentieth-
Century China. (3) Three 1-hour lectures per week.
The impact of modern Chinese literature and China’s re
sponse in literary theory, movements, and creation.
When not given see Oriental Languages 206. (F) Liu
165. Myth and Literature. (3) Two 1½-hour lecture
and discussion periods per week. Study of the earliest
myth texts and of the progressive growth of literature
out of myth to the present day. Myth and oral com
position. Emphasis on the meanings of myth as reflecte
d in varying idioms. (SP) Nagler
166. Literature of War and Peace. (3) Two 1½-hour
lectures and discussion periods per week. Exploration
of important war themes in neither genre of literature
sentimentalize peace but illuminate the problem.
Works ancient and modern, fiction and non-fiction,
from Western and Eastern traditions will be canvassed.
170. Special Topics in Comparative Literature. (1-
4) May be repeated for credit when topic changes. To
be arranged. Prerequisites: Restricted to majors in
Comparative literature or by consent of instructor.
An independent studies course designed to fulfill a need
in the undergraduate major’s program which cannot
otherwise be satisfied because it involves either a
literature not covered in regularly scheduled course
offerings or a special methodological framework or bias
of selection. (F,SP) Kozanamidou
185. Women’s Perspective in Literature. (3) May
be repeated for credit with the consent of the instruc
tor. Two 1½-hours of lecture and discussion per week.
Comparative study of women writers or the portrayal of
women in the literature of various national cultures.
Topics will vary from year to year.
190. Comparaison of Authors. (3) Three 1-hour lec
tures per week. Prerequisites: 100 or equivalent and at
least four hours of division literature, including at
least one semester in a literature other than English.
Comparison of three major authors written in three
different languages. One foreign author must be read
in the original language. Examination and subst
antial comparative paper required. (F,SP) Augst,
Kurke, Monroe
H195. Honors Course. (1-3) Course may be re
peated for credit. To be arranged. Prerequisites: Hon
ors standing, 8 units in upper division literature
courses, including 100 or the equivalent, and knowl
dge of a vernacular language and either Greek or
Latin. Preparation and writing of an honors thesis un
der the supervision of a member of the faculty. (F,SP)
195. Supervised Independent Study and Research. (1-
4) Course may be repeated for credit. To be ar
ranged. Must be taken on a pass/fail/credit basis.
Enrollment restricted to regulations listed on pages
91-92. (F,SP) Staff
Graduate Courses
The following graduate courses numbered 200
through 250 require at least 16 hours of week
effort, including time spent in class and in outside
reading and preparation.
200. Introduction to Comparative Literature. (4)
One 3-hour lecture and discussion period per week.
Prerequisites: Preparation in any two foreign
languages. Introduction to the field of Compari
native Literature. Required of all candidates for the
M.A. degree, to be taken during the first year of resi
dence. Lectures on literary theory, on the history of crit
icism, and on the methods of comparative literary
study. (F) Holub
202. Approaches to Genre. (4) Two 1½-hour lec
tures and discussion periods per week. Prerequisites:
Admission to graduate standing in Comparative Lit
erature. Undergraduates may be admitted with the
consent of the instructor. Application of the methods
of Comparative Literature to the study of gen
res. (F)
202A. Epic and Saga. (4) 202B. Lyric Poetry. (4) (F) Weisinger
202C. The Novel. (4) (SP) Augst
202D. Dramatic Literature. (4)
208. The Disciplines of Comparative Literature. (4)
One 3-hour lecture and discussion period per week. Prereq
uisites: Completion of 200 and one semester of 202,
and admission to the Ph.D. program. The methods
and subject matter of Comparative Literature. Read-
ings and discussion of representative theoretical and
analytical works. Survey of bibliographical resources.
210. Studies in Ancient Literature. (4) One 3-hour
lecture and discussion period per week. Prerequisites:
Preparation in ancient Greek and Latin, and familiar
liarity with any language or historical periods, per
forman. Comparative investigation of a topic in ancient lit
erature between the eighth century B.C. and the fourth
century A.D., with some attention to subsequent de
velopments.
212. Studies in Medieval Literature. (4) One 3-hour
lecture and discussion period per week. Prerequisites:
Preparation in two foreign languages. Comparative
investigation of a topic in Western literature in the
Renaissance period. (F) Clubb
220. Studies in Neoclassical Literature. (4) One 3-
hour lecture and discussion period per week. Prereq
uisites: Preparation in two medieval languages. Comparative
investigation of a topic in Western literature
between the end of the Renaissance and the beginning
of the nineteenth century.
223. Studies in Romanticism. (4) One 3-hour lec
ture and discussion period per week. Prerequisites:
Preparation in two foreign languages. Comparative in
vestigation of major themes in European Romanticism.
224. Studies in Realism. (4) One 3-hour lecture and
discussion period per week. Prerequisites: Preparation
in two foreign languages. Comparative investigation
of a topic in nineteenth and early twentieth-century Eu
ropean Realism, with attention to historical, theoretical,
and methodological problems. (F) Alter
(4) One 3-hour lecture and discussion period per
week. Prerequisites: Preparation in two foreign lan
guages. Comparative investigation of a topic in Euro
pean literature between 1840 and the beginning of the
contemporary period.
227. Studies in Contemporary Literature. (4) One
3-hour lecture and discussion period per week. Prerequisites:
Preparation in an Oriental and one other foreign
language. Comparative investigation of a literary topic
requiring the study of both Oriental and Western literatures.
When not given see Oriental Languages 206. (SP) Liu
230. Studies in Oriental-Western Literary Relations.
(4) One 3-hour lecture and discussion period per
week. Prerequisites: Preparation in a Near Eastern
or Western language. Undergraduate may be ad
mitted with consent of the instructor. Comparative in
vestigation of a literary topic requiring the study of both
Near Eastern and Western documents. (F) Monroe
...
601. Individual Study for Master's Students. (1-8) Course may be repeated for credit. To be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Individual study for the comprehensive or language requirements in consultation with the Graduate 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. (1-8) Course may be repeated for credit. To be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Satisfactory completion of the Master's examination. Individual study in consultation with the Graduate Adviser is limited to provide opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. May not be used for unit or residency requirements for the doctoral degree. (F,SP)

Professional Courses

360A-360B. Methods of Teaching Literature and English Composition. (4,4) Course may be repeated for credit. One 1-hour discussion period and three 1-hour laboratory sessions per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as a teaching assistant or consent of the instructor. Discussion of approaches to teaching composition at the college level in relation to the reading of masterpieces of literature. Designed primarily for instructors in the freshman composition course. (F,SP) Gehlke

361A-361B. Pedagogical Practice. (4,4) Course may be repeated for credit. To be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Teaching appointment. Supervised classroom teaching. (F,SP) Gehlke

Computer Science

(College of Letters and Science)

Computer Science Degree Division: 571 Evans Hall

Faculty and Courses

Computer Science faculty and courses are listed under the Department of Electrical Engineering and Computer Sciences.

Choice of College

Undergraduates who wish to major in computer science may do so either through the College of Letters and Science (A.B. degree) or through the College of Engineering (B.S. degree). Details about the computer science and engineering program in the Department of Electrical Engineering and Computer Sciences may be found under Electrical Engineering and Computer Sciences.

Computer Science Major in the College of Letters and Science

The major in computer science encompasses computer software, architecture, theory, and applications. It prepares students for employment or for further study in computer science at the graduate level. Because of large demand and limited resources, the number of computer science majors is restricted. In order to gain admission to the major it is usually necessary to achieve a grade-point average of 3.0 or better in the lower division requirements. Students should apply at the Computer Science Advising Office, 522 Evans Hall.

Transfer students should apply for provisional admission to the major as part of their application for admission to Berkeley. Students transferring to Berkeley without first obtaining provisional acceptance may find themselves unable to gain admission to the major. Further information is available from the Advising Office, (415) 642-7214.

Requirements for the Major

Lower Division Requirements: The following lower division courses are required for the major:

2. Discrete mathematics (Math 55).
3. Electronics (EE 42 or, alternatively, EE 40 or 40I). It is strongly recommended that EE 43, a 1-unit laboratory course, be taken concurrently with EE 42.
4. Computer science (CS 60A-60B-60C). All of the above courses must be graded; none may be taken passed/not passed.

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, or EE 140 and EE 145M).
   b. Software (CS 162 or CS 164, i.e., a course different from that taken to satisfy the core requirement).
3. Theory (CS 172 or CS 174).
4. An upper division mathematics or statistics course (Math 160 and Stat. 131A, 131B, or 131F are not acceptable; Engineering 116 may be used to satisfy this requirement).
5. Technical electives, subject to the approval of a faculty adviser. A list of technical electives for which approval will be routinely granted is available at the Advising Office.

Minimum Scholarship: All courses taken in satisfaction of the major requirements must be graded; none may be taken passed/not passed. A GPA of 3.0 in the upper division courses is required for graduation. The division monitors the progress of majors and expects them to maintain a 2.0 GPA from semester to semester.

Honors Program: Requirements for graduation with honors are:

1. A GPA of 3.5 in the major, and overall;
2. A breadth course in all three areas (hardware, software, theory);
3. Completion of an honors project under the direction of a regular computer science faculty member. The project may be carried out in the Honors Seminar, CS 299, or with an individual faculty member for CS 199 credit.

For graduation with high honors or highest honors, see the Announcement of the College of Letters and Science.

Minor in Computer Science

A minor in computer science is available to all undergraduate students at Berkeley, except CS and EECS majors, through the College of Engineering. Requirements for the minor are Math 55, CS 60A-60B-60C, and any three upper division courses in computer science. These courses must be completed with a 3.0 GPA. Further details are available from the Advising Office, 522 Evans Hall.

Graduate Program

Graduate degree programs are available as preparation for research and teaching (Master of Science, Master of Arts, and Doctor of Philosophy in Computer Science and Engineering) and for careers in design, development, management, and administration (Master of Engineering and Doctor of Engineering). For details on graduate programs and procedures, see the Electrical Engineering and Computer Science section of this catalog.

Conservation and Resource Studies

(Designated Emphasis Program)

Conservation and Resource Studies

(Office of Natural Resources)

Department Office: 112 Glannini Hall, 642-6730
Chair: Donald Dahlsten, Ph.D.

Professors:

Field W. Cobb, Jr., Ph.D. Pennsylvania State University. Forest pathology
Donald L. Dahlsten, Ph.D. University of California at Berkeley. Forest pathology, chemical control
Joseph G. Hankow, Ph.D. University of Wisconsin. Microbial ecology, environmental education
Carolyn Merchant, Ph.D. University of Wisconsin. Environmental history, philosophy, ethics
John R. Parmeter, Jr., Ph.D. University of Wisconsin. Forest pathology
Robert D. Raabe, Ph.D. University of Wisconsin. Fungal ecology, ornamental pathology
Arnold M. Schultz, Ph.D. University of Nebraska. Systems ecology

Associate Professors:

Michael W. Wood, Ph.D. University of Minnesota. Fungal ecology, insect behavior
Angela C. Little, Ph.D. (Emeritus) University of California at Berkeley. Psychological responses to food
Iver J. Schlinger, Ph.D. (Emeritus) University of California at Davis. Systematics and ecosystem ecology

Lecturers:

Richard Garcia, Ph.D. University of California at Berkeley. Biological control, research
Alan S. Miller, D.Min. San Francisco Theological Seminary. Graduate Theological Union. Environmental science, biotechnology
Jonas E. Richmond, Ph.D. University of Rochester. Biomedical sciences, community health

Undergraduate Program

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, population, energy, technology, social institutions, and cultural values. Students draw on the course offerings of the entire campus and appropriate community resources in the development of individual programs of study. The major's orientation is toward flexibility and an individualized education approach to understanding the structure and dynamic functions of complex environmental systems. Conservation studies is not a substitute for a major in science, but it encourages interaction among students, faculty, and community.

Department offerings are designed to help each student formulate an area of interest, but are not in any way meant to limit the range of options available. The sequences of courses offered through the department augment the courses of the college and those of the campus and define the academic subjects germane to the field of conservation and resource studies.

Course requirements for the major include 10, 90, 100, and 194. In the freshman and sophomore years, students will be expected to take two courses in reading and composition, one course in mathematics or statistics, a minimum of two courses in the biological sciences and two in the social sciences. In addition, students must take two courses in each of two of the following 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.

Admission to the C/E program is limited. Applications for on-campus transfers from other majors are reviewed on an individual basis. Deadlines for mid-January for spring admission and mid-February for fall semester (check with department for exact dates).

*Not offered 1991-92
On leave, spring, fall
On leave, fall
*Recipient of Distinguished Teaching Award
Minor Program

A minor in CRS is available to any Berkeley student in good academic standing. Requirements are completion of CRS 10 and any four additional CRS courses, three of which must be upper division. All courses must be a minimum of 2 units, must be taken for a letter grade, and must average a minimum of 2.0 (C) overall. Additional information about requirements is available from the CRS office.

Graduate Studies

CRS has no graduate major under its own administration. However, the department offers a limited number of graduate courses and an, on an ad hoc basis, may facilitate admission of students to appropriate majors within other departments to pursue graduate studies in a particular aspect of conservation and resource studies under the direction of CRS faculty. In most cases, students admitted under this arrangement will plan a program of study that will fulfill all normal degree requirements for the graduate major in which they are enrolled. More information may be obtained from the Department of Conservation and Resource Studies.

Lower Division Courses

10. Environmental Issues. (4) Two 1½-hour lectures and one 1½-hour discussion per week. Relationship between human society and the natural environment; case studies in maintenance and degradation. Issues of economic development, population, energy, resources, technology, and alternative systems. (F,SP) Miller

10L. Environmental Issues: Special Projects. (1) Course may be repeated for credit. One 1½-hour discussion per week under the direction of a faculty member. (SP) Project groups related to the 10 lecture series. (F,SP)

40. Environmental Chemistry. (2-3) Students with credit in Chemistry 1A or equivalent are eligible to receive only 2 units of credit. Two hours lecture per week; additional 2-hour discussion for those 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 the sciences may enroll for three units instead of two. (SP) Huismann

60. Environmental Biology. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: Lower division: One course in introductory college biology is recommended. Intended for non science majors. Basic biological and ecological processes discussed in 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) Dahsten

90. Introduction to Conservation and Resource Studies. (1) One 2-hour seminar per week for eight weeks. 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. One field trip is normally required. Regular attendance of CRS majors entering with fewer than 60 units. (F,SP) Staff

98. Directed Group Study in CRS. (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: Lower division standing; consent of instructor, adviser, and department chair. Study of special topics that are not covered in depth in regular courses in the department. (F,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: Consent of instructor (3.4 GPA or better), consent of instructor, adviser, and department chair. Usually restricted to CRS majors. Intended for exceptional students. Supervised independent study or research on topics relevant to CRS that are not covered in depth by other courses. Open to students in good standing with faculty sponsor present a proposal with clearly formulated objectives and means of implementation. (F,SP) Staff

Upper Division Courses

100. Environmental Problems: Principles and Methods of Analysis. (4) Two 1½-hour lectures and one 1½-hour discussion per week. Prerequisites: One course in ecology; one course in mathematics or statistics; one course in a social science or economics. Analysis of the complex and controversial interface between natural and social science explanations of environmental problems. Case studies, emphasizing physical, biological, social, and economic, and value dimensions in the identification of causes and approaches to solutions. One 1½-hour field trip. (F,SP) Miller

101. Urban Garden Ecosystems. (4) Three hours of lecture and three hours discussion/demonstration per week. Study of urban garden and recreation ecosystems, with emphasis on basic ecological concepts and techniques for managing plant and animal systems. Averaging of hours/week/field work in garden. (SP) Staff

101L. Urban Garden Ecosystems Laboratory. (1) One 3-hour supervised laboratory project per week. Must be taken on a passed/not passed basis. Prerequisites: 101. Special projects. (F)

102. Agricultural Ecology. (3) Formerly 191K. Two 1½-hour lectures per week. Prerequisites: Consent of instructor. Examinations in a holistic framework fundamental biological, technical, socio-economic and political processes that govern agroecosystem productivity and stability. Management techniques and farming systems' designs that sustain long-term production are emphasized. One Saturday field trip and one optional field trip. (SP) Allerton

105. Forest Pest Management. (3) Two hours of lecture per week and four 1 to 2 day field trips. Prerequisites: One course in biology. Formerly Pest Management 155. The role of destructive insects, diseases, and other pests in forest ecosystems, their impacts on forest resource values and management objectives, and interactions with man's activities. Diagnoses and evaluation of forest pest situations, and strategies of regulation and control in a systems context. (F) Wood

110. Ecosystematology. (4) Three hours of lecture and 1½ hours of discussion per week. Prerequisites: 100 or any ecology course or consent of instructor. Conceptual tools for studying large, complex ecosystems in which we are important dependent components, planning agents, indifferent observers; how to deal with complex; the systems approach to problem solving; determining systems boundaries; ecological concepts; ecosystem management. A weekend field trip is required. (SP) Schultz

115. Environmental Philosophy and Ethics. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 100 or consent of instructor. A critical analysis of human environments as physical, social, and political ecosystems with emphasis on the role of ideologies, beliefs, attitudes, and behavior. An examination of contemporary environmental literature and the philosophies embodied therein. (F) Miller

116. Bioethics. (3) Two hours of lecture and 1 hour of discussion per week. Exploration of the ethical dilemmas arising from recent advances in the biological sciences: genetic engineering, socio-biology, health care delivery, behavior modification, patients' rights, social or private control of research. (SP) Miller

130. Environmental Policy, Administration, and Law. (4) Three hours of lectures and one hour of discussion per week. Prerequisites: At least one course in political science, public policy, or environmental issues. Introduces American political process affecting policies on land, water and energy resource development and implementation. Different topics will be discussed in depth. Emphasizes national institutions and exercise of administrative discretion. Reviews key management programs: air or water quality, public forests, pesticide regulation, coastal zone protection. (F) Staff

131. Legal Aspects of Resource and Environmental Administration. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 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 on physical, ecological and social impacts as they relate to environmental planning and problem solving. Includes group environmental impact report writing. One required field trip. (SP) Staff

140. Environmental Health and Development. (3) Three hours lecture per week. Impact of environmental alterations resulting from development programs and other human activities which are taking place in developed and less developed parts of the world. Case studies and mitigation measures of diseases associated with water storage utilization. (F) Staff

150. American Environmental and Natural Resource History. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: Consent of instructor. History of the natural and human environments as interrelated systems from the colonial period to the present. Human factors—demographic, economic, social, technological, intellectual—promoting the exploration of environmental change and those associated with their activities. (F) Merchant

151. U.S. Agricultural Development in the 20th Century. (3) Three hours of lecture and one hour of discussion per week. An examination of economic and political forces that shaped U.S. agriculture since 1920 with special attention to impacts of agricultural policies on land, water and energy resource development and on the environment, particularly in California. (SP) Leveen

163. International Rural Development: Comparative Systems. (3) Three hours of lecture and one 1-hour discussion per week. Comparative analysis of policy systems governing natural resource development in rural Third World. Emphasis on organization and function of agricultural and minerals development, with particular consideration of rural hunger, resource availability, technology, and patterns of international aid. (SP) Carr

166. Political Ecology. (4) Three hours of lecture and one 1-hour discussion per week. Analysis of ecological problems in the U.S. from the standpoint of their roots in contemporary political and economic processes and the potential solutions within the present political system. Special emphasis on U.S. policy regarding energy and agricultural development, considered within the global context. (F) Carr

168. Natural Resource Policy and Indigenous Peoples. (4) Three hours of lecture and one 1-hour discussion per week. 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 developmental policies and their effects. (SP) Carr

190. Seminar in Environmental Issues. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Upper division standing and consent of instructor. Interdisciplinary study of issues for advanced students. Designed to develop skills in critical analysis of environmental issues. Different topics will be available each semester reflecting faculty and student interest. Major research project required. (F,SP) Staff
194. Senior Seminar in Conservation and Resource Studies. (2) One 2-hour seminar per week. Prerequisites: Senior standing in CR&S. Seminar in which students use their knowledge, skills, and interests into a holistic perspective. A one-hour oral presentation in the area of interest and a senior thesis synthesizing the Area of Interest. Required final semester for all CR&S majors. (F,SP) Staff

195. Senior Thesis. (3-4) Students who have succeeded in 195 may petition for exemption from CRS 194. Three hours of laboratory or research work per week per unit. Prerequisites: Senior standing in CR&S; 3.0 GPA. Subject must be approved by faculty sponsor during final semester of the junior year and course initiated in the first semester of the senior year. (F,SP) Staff

196A. Internship in CR&S—Field Module. (3-4) 15 to 40 hours per week at placement location for 10 weeks. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing; consent of adviser, faculty sponsor, and CR&S department; normally restricted to CR&S majors. Internship placement relevant to student's academic interests and career objectives. Must be approved by department early in preceding semester. See "Internship Guidelines," available from department office. (F,SP) Staff

196B. Internship in CR&S—Research/Seminar Module. (2-5) 2-hour seminar per week; variable hours research/analysis for five weeks. Prerequisites: Upper division standing; consent of adviser, faculty sponsor, and CR&S department; completion of 196A. A five-week period for the student's analysis of his/her internship experience, preparation of internship report (under the supervision of chair of the intern's committee), and participation in a weekly seminar required of all returning interns. (F,SP) Staff

197. Field Study in CRS. (1-3) May be repeated for credit. Approximately 3 hours field study per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing; consent of adviser, instructor, and department chair. Upper division standing. Usually restricted to CR&S majors. Supervised experience in off-campus organizations relevant to specific aspects of CR&S. Required. Individual experience: consent of instructor, faculty sponsor, and written reports required. (F,SP) Staff

198. Directed Group Studies for Advanced Undergraduates. (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: Upper division standing; consent of instructor, adviser, and department chair. Study of special topics that are not covered in depth in regular courses in the department. (F,SP) Staff

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Approximately 3 hours of laboratory per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor, adviser, and department chair. Enrollment is restricted by regulations listed in General Catalog. Supervised independent study and research specific to aspects of conservation and resource studies. (F,SP) Staff

Graduate Courses

250. Environmental History, Philosophy and Ethics. (3) 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 ethics, and the relationships between environmental history, philosophy, ethics, ecology, and policy. (F) Merchant

260. International Rural Development Policy. (3) Three hours lecture/discussion per week. Prerequisites: One upper division course in international development studies, or one introductory course in Third World economy, ecology, and environment and ways in which these are affected by development policies. Historical dimensions of Third World environmental problems. Changing patterns of rural production (especially food) and resource use; alternative theories of natural resource and socioeconomic development; linkages between socioeconomic and environment in agarian change and development policy; technology and resource control; Conservation and Development problems. (SP) Carr

298. Directed Group Study. (1-4) Course may be repeated for credit. One lecture/discussion hour per week per unit. Prerequisites: Consent of instructor. Directed group study on topics in conservation and resource studies not covered by available courses or seminars. (F,SP) Staff

299. Directed Research. (1-4) Course may be repeated for credit. Independent conferences to be arranged; approximately four hours of work per week per unit. Prerequisites: Graduate standing and consent of instructor. Directed individual research on problems in conservation and resource studies. (F,SP) Staff

Interdepartmental Studies Courses

IDR 80. 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 departments: Conservation and Resource Studies and Physics. (F)

Upper Division Courses

IDS 121A-121B. Environmental Education. (3) Five and one-half hours of lecture/discussion and six hours of field work per week. Must be taken on a passed/not passed basis. Prerequisites: 121A is prerequisite to 121B; consent of instructor. 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. Sponsoring departments: Education and Conservation and Resource Studies. (F) Hurst

Dance

(Regular Office of Letters and Science)
Office: Dramatic Art Department, 101 Dwinelle Annex, 642-1677
For information about dance courses and curricula, see information listed under the Department of Dramatic Art.

Demography

Graduate Group Office: 2232 Piedmont Avenue, 642-0507
Chair: Eugene Hammel, Ph.D.

Professors:
Ira Adelman, Ph.D. (Agriculture and Resource Economics)
Pranab Bardhan, Ph.D. (Economics)
Burton Benedict, Ph.D. (Anthropology)
Stanley Braverman, Ph.D. (Anthropology)
David Brillinger, Ph.D. (Statistics)
Carlo Cipolla, Laurea cum laude (Economics)
Jan DeVries, Ph.D. (History)
Claude Fischer, Ph.D. (Sociology)
Eugene Hammel, Ph.D. (Anthropology and Demography)
Richard Herr, Ph.D. (History)
Michael Hout, Ph.D. (Sociology)
Mark Janz, Ph.D. (Health)
Ronald Lee, Ph.D. (Demography and Economics)
John Logan, Ph.D. (Public Policy)
Richard Sutch, Ph.D. (Economics)
Michael Tarter, Ph.D. (Public Health)
Russell Thurstone, Ph.D. (Geography)
Kenneth Wachter, Ph.D. (Demography and Statistics)
Melvin W. Warf, Ph.D. (Geography and Planning)
Woodrow Borah, Ph.D. (History) (Emeritus)
Leng Davis, Ph.D. (Sociology and Demography) (Emeritus)
Donald Foley, Ph.D. (City and Regional Planning) (Emeritus)

Associate Professors:
James Anderson, Ph.D. (Anthropology)
Frances Van Loo, Ph.D. (Business Administration)
Assistant Professor:
John R. Welch, Ph.D. (Demography)

The regional Graduate Group in Demography includes faculty at Berkeley, Davis, Stanford, and the Agriculture Experiment Station at any of these locations by students registered at any of them. The graduate degree programs in demography, as such, are located only at Berkeley, where the Graduate Group offers general course work at both the undergraduate and graduate levels, as well as professional training leading to the Master of Arts and Ph.D. degrees in demography. Particular emphases are placed on the interrelationships between population structure and change and on the social, cultural, and economic characteristics of populations.

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 before as well as. Students already enrolled at UC campuses or Stanford are admissible to demography courses if they have completed the prerequisites. Those not at Berkeley must make the necessary intercampus exchange arrangements. Seniors are admissible to the graduate courses by consent of the instructor. Although there is no undergraduate major, the Group in 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 petition. Applicants for the master's program may be admitted to the University who wish to enter the degree program 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.

Note: Demography undergraduate courses are given under the auspices of the Special Program in Population Studies in the College of Letters and Science.

Minor in Demography

UC Students may complete one or more minor programs, normally in a field both academically and administratively distinct from their major. For the minor in demography, students must complete, with a minimum grade-point average of 2.0, a total of five upper division courses. All courses applied to the minor must be taken on a letter-graded basis. At least three of the five upper division courses must be completed at Berkeley.

Requirements: One general introductory course in population, consisting of one of the following: Anthropology 189A, Population Studies 100, or Sociology 126; one course in demographic methods: Population Studies 105, one course in statistical methods or vital statistics, consisting of one of the following: Public Health 121, Public Health 122, Statistics 131A, Statistics 131B, Statistics 131F, or Sociology 134; Mere Karen Knox, dealing with demographic factors, consisting of one of the following: Economics 105, Economics 112, Economics 113, Economics 175, History 198B, History 198, Population Studies 105, Sociology 111, Sociology 112.

The faculty in demography may allow additions to or substitutions within the sublists, depending on the courses available on the campus. With the approval of the chair of the department, students may take graduate courses subject to the approval of the instructor and the Graduate Group Chair. Students may substitute other upper division courses subject to the approval of the Graduate Group Chair. Students may substitute other upper division courses subject to the approval of the instructor and the Graduate Group Chair.

*Not offered 1991-92
*On leave, spring
*Recipient of Distinguished Teaching Award

Graduate Schools and Programs
Graduate Courses

200. Seminar in Introductory Population Theory. (1) One 1-hour seminar per week. Prerequisites: Consent of instructor or prior or concurrent enrollment in Population Studies 100, Sociology 126 or Economics 175. Formerly a portion of 200 and 201. Required of graduates in the MA or Ph.D. program in Demography. (F.S.P) Wilmeth

201. Advanced Population Theory. (4) Course may be repeated for credit. Two 1 1/2-hour lectures per week. Prerequisites: 200, Pop Stud 100 or consent of instructor. Demographic transition theory, sociological and economic theories of population process and change. (F.S.P) Lee

210. Introductory Demographic Analysis. (4) Two 1 1/2-hour lectures and one 1-hour seminar. Prerequisites: Consent of instructor. Required of graduate students in the MA or Ph.D. program in Demography. (F.) Wachter

211. Advanced Demographic Analysis. (4) Two 1 1/2-hour lectures per week. Prerequisites: 210, 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. (F.S.P) Wilmeth

212. Advanced Demographic Methods. (4) One 3-hour seminar per week. Prerequisites: 210. Statistical analysis of demographic data, sensitivity testing of standard methods, refinement of analytical techniques, microsimulation. (F.) Wachtter

230. Human Mortality. (4) Two 1 1/2-hour lectures per week. Prerequisites: Consent of instructor. Analysis of life table data, and application of demographic theory. (F.S.P) Wachter

231. Topics in the History of Population. (4) Two 1 1/2-hour seminars per week. Selected topics in historical demography, especially in the West. (F) Wachter

232. Population and Development. (4) Three hours of lecture/seminar per week. Prerequisites: Consent of instructor. This course will examine some of the major theories and problems of population and development in Third World countries. It will devote a certain amount of time to the study of demography and development in other regions. (F.S.P) Staff

293. Proseminar in Research. (4) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: 292. Introduction to demographic research. (F.S.P)

299. Directed Research. (1-12) May be repeated for credit. Prerequisites: Consent of instructor. Intended to provide guided research for special problems. (F.S.P) Staff

301. Individual Study. (1-8) May be repeated for credit. Must be taken under the supervision of a faculty member. (F. S.P) Staff

293. Directed Research. (1-12) May be repeated for credit. Prerequisites: Consent of instructor. Intended to provide supervision in the preparation of an original research paper or dissertation. (F.S.P) Staff

299. Directed Research. (1-12) May be repeated for credit. Prerequisites: Consent of instructor. Intended to provide supervision in the preparation of an original research paper or dissertation. (F.S.P) Staff

293. Directed Research. (1-12) May be repeated for credit. Prerequisites: Consent of instructor. Intended to provide supervision in the preparation of an original research paper or dissertation. (F.S.P) Staff

301. Individual Study. (1-8) May be repeated for credit. Must be taken under the supervision of a faculty member. (F. S.P) Staff

Related Courses in Other Departments

Economics 75. World Population and Economics. (4)
Economics 175. Economic Demography. (4)
Economics 275A. Economic Demography. (3)
Economics 275B. Selected Topics in Economic Demography. (3)
Economics 275B. Selected Topics in Economic Demography. (3)
Population Health 121. Introduction to Vital and Demographic Statistics. (4)
Public Health 122. Introduction to Health Statistics. (4)
Public Health 233. Theory of the Life Table and Competing Risks and Their Applications. (4)
Sociology 126. Population. (4)
Population Studies 5. Seminar in Population. (2)
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 to the program, (2) must have completed the first five lower division requirements, and (3) should declare the major no later than the semester in which they complete the 61st unit. Junior transfer students should contact the Group Major Office concerning their eligibility.

Students are reminded that (1) no course work for the major may be done on a passed/not passed basis, and (2) no course work 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 from the major in Development Studies, students must enroll in the two-semester honors seminar, Development Studies H195A-195B, 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. Students participating in the Honors Program may be checked in the Group Major Office. Students who do not meet the honors criteria but who wish to participate in the program are encouraged to speak with their faculty advisers and honors seminar instructor.

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 studies. Students 194 and 150 are seminars on special topics courses taught by Development Studies faculty. Other course work in this category may be approved by a faculty advisor.

Course Plan

There is considerable flexibility within the development studies major which permits and encourages students to construct a program appropriate to their specific intellectual and geographic interests. The overarching structure of the major presumes, however, that each student has a three-tiered program: First, a series of lower division courses, in which DS 10, Introduction to Development Studies, is central and provides a basic theoretical and methodological grounding in development studies. Second, a series of upper division classes including the required DS 100, History of Development and Underdevelopment, and four other courses with a strong disciplinary and development focus (economics, political science, geography, political economy, sociology, etc.). Third, a three-course sequence focusing on a geographic region (Latin America, South Asia, Northeast Asia, Africa, etc.) through which students build a working knowledge of the culture, history, and political economy of one part of the developing world. In addition, students may enroll in the Honors Program, which consists of a two-semester senior thesis seminar (DS H195A-195B), or in the Senior Program, in which students pursue advanced topics in development (DS 194, 150).

Lower Division

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. Students may find the DS 100 course too demanding without having first enrolled in DS 10. Lower division core courses may be satisfied with appropriate upper division classes with prior consent from a faculty advisor. Several options are listed below. Consult the Group Major 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 2, Introduction to Political Science; Statistics 2, Introduction to Statistics, or Statistics 20, Introduction to Probability and Statistics.

Note: With prior written consent from a faculty advisor, students may make the following substitutions: Anthropology 3: Anthropology 17, 73, or 144; Economics 1: Economics 20, 110; Political Science 2: Political Science 136A, 139A, 139B, or 139C.

Recommended Courses

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:


Upper Division

Required Courses

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 A 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) developmental theory. Each DS major should endeavor to build up a strong command of one social science discipline (for example, economics, politics, 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: 111A, 141, 143 (Note: This is a specialized course; consult with the instructor and your adviser before enrolling), 144, 147, 148, 169B.
Economics: 100A and 100B; or 101A and 101B;
Geography: 100, 110, 116, 130.
History: 101, 103.
Political Economy: Economics 106, 109; Geography 110; Political Science 115B, 126A, 126B.
Political Economy of Natural Resources: 100, 101, 151.

Development Courses: Minimum of two courses selected from the following list.

Anthropology: 115, 116, 144, 145, 146, 150, 153, 156A, 156B, 157, 158, 166, 189A.
Business Administration: 188.
City and Regional Planning: 110, 111, 115, 116, 127.
Conservation and Resource Studies: 151, 163, 168.
Development Studies: 150, 194, 197, 198, 199.
Energy and Resources: 100, 151.
Ethnic Studies: 147, 149, 190.
*Requires prior written approval from a faculty advisor.
Interdepartmental Studies (IDS): 290.
Military Affairs: 170.
Political Economy of Natural Resources: 102, 152.
Political Science: 121, 131, 139A, 139B, 139C, 182, 208.
Population Studies: 100.
Public Policy: 166, 181, 184, 185, 187.
Rhetoric: 150, 155.
Social and Administrative Health Sciences: 150, 176, 206, 207.
Social Welfare: 100B.

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 advisor. 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: Anthropology 190A, 190B; Behavioral and Environmental Health Sciences 122; Economics 141; Industrial Engineering and Operations Research 162, 171, 180; Political Economy of Natural Resources 118; Political Science 132A-
Upper Division Courses

100. History of Development and Underdevelopment. (4) Two 1 1/4-hour lectures and one 1 1/4-hour discussion per week. Historical review of the development of world economic systems and the impact of these developments on less advanced countries. Course objective is to provide background against which to understand and assess theoretical interpretations of development and underdevelopment. (SP)

150. Advanced Studies in Development. (3) Course may be repeated with consent of instructor. Two 1 1/4 hour sessions per week. Prerequisites: Consent of instructor and background in development or related social sciences. Advanced multidisciplinary research in current issues and topics of development. Seminars will focus on specific geographical areas with appropriate comparative material included. A major research project is required as well as class presentations. Topics change each semester. (F,SP)

94. Seminar in Development Studies. (4) Two 2-hour seminars 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)

H195A-H195B. Senior Honors Thesis. (4/4) One 2-hour seminar plus 1-hour discussion per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Senior standing. Check with the Group Major office for current requirements. The honors student is required to write a thesis on research performed in the H195A-H195B course. The thesis will be reviewed by the honors instructor and a second reader to be selected based on the thesis topic. (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 Development Studies in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

198. Directed Group Study. (1-4) Course may be repeated for credit. Group meetings to be announced. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Directed group study (upper division). (F,SP)

199. Supervised Independent Study and Research for Undergraduates. (1-4) Course may be repeated for credit. Individual meetings. Must be taken on a passed/not passed basis. Prerequisites: Written proposal must be approved by a faculty advisor. Enrollment is restricted by regulations of the College. (F,SP)

Dramatic Art

Chair: Lorne Buchman, Ph.D.

Professors:
Mel Gordon, Ph.D. New York University. Stanislavsky, directing. (SP)
Dunbar H. Ogden, III, Ph.D. Yale University. Theater history, dramatics. (F)
William H. Oliver, Ph.D. Cornell University. Directing, acting, Spanish theater. (SP)
John Warren Travis, M.F.A. Stanford University. Scenography. (SP)

Marni Thomas Wood, B.A. Sarah Lawrence College. Dance, choreography, dance history.

Travis Bogard, Ph.D. (Emeritus) Princeton University. British/American drama. (SP)
Fred Ochs Harris, M.F.A. (Emeritus) University of Washington. Directing, acting. (F)
Henry May, B.A. (Emeritus) University of Illinois. Scenography. (SP)

Marvin Rosenberg, Ph.D. (Emeritus) University of California. Shakespeare, playwriting. (SP)

Representative seating and modernizing experience relevant to specific aspects of Development Studies in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

No course in Dramatic Art offered in satisfaction of undergraduate major requirements may be taken on a passed/not passed basis except Dramatic Art 141A-141B, 142A-142B, 143A-143B, 170, and 171.

Dramatic Art—Dance

Chair: Lorne Buchman, Ph.D.

Professors:
Mel Gordon, Ph.D. New York University. Stanislavsky, directing. (SP)
Dunbar H. Ogden, III, Ph.D. Yale University. Theater history, dramatics. (F)
William H. Oliver, Ph.D. Cornell University. Directing, acting, Spanish theater. (SP)
John Warren Travis, M.F.A. Stanford University. Scenography. (SP)

Marni Thomas Wood, B.A. Sarah Lawrence College. Dance, choreography, dance history.

Travis Bogard, Ph.D. (Emeritus) Princeton University. British/American drama. (SP)
Fred Ochs Harris, M.F.A. (Emeritus) University of Washington. Directing, acting. (F)
Henry May, B.A. (Emeritus) University of Illinois. Scenography. (SP)

Marvin Rosenberg, Ph.D. (Emeritus) University of California. Shakespeare, playwriting. (SP)

Representative seating and modernizing experience relevant to specific aspects of Development Studies in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

No course in Dramatic Art offered in satisfaction of undergraduate major requirements may be taken on a passed/not passed basis except Dramatic Art 141A-141B, 142A-142B, 143A-143B, 170, and 171.

Dramatic Art Program

Preparation for Graduate Study. The background of a student undertaking work toward an advanced
degree should approximate that of an undergrad- 
uate major student in the Department of Dramatic 
Art at Berkeley. Applicants for admission who need 
exceptative preparatory work either in dramatic lit- 
erature or performance may be required to tak- 
the necessary courses while enrolling in limited 
status in the College of Letters and Science. Admis- 
sion to the limited status program, however, is 
not automatic. In some instances a one-year 
course of study for a second bachelor’s degree 
may be in order (admission to the second bache- 
or’s degree program, however, is not automatic). 
Students enrolled in the admission to the limited status 
program or to the second bachelor’s degree pro- 
cram in the College of Letters and Science may 
obtain information on these programs from the 
College Office (115 Campbell Hall).

Advising and Evaluation of Student Program. 
Yearly, at the end of the fall semester, a team of 
two faculty advisers will assist each graduate stu- 
dent to develop a program of study. In order to en- 
sure, insofar as possible, that all students are 
working at maximum capacity toward a degree ob- 
jective commensurate with their talent and schol- 
arity ability, the faculty meets at the end of each 
academic year to evaluate the work of each stu- 
dent. Grades of satisfactory and unsatisfactory, 
based on both positive and negative, are communi- 
cated to the student in a letter from the chair. At this time, the faculty may 
suggest that a student’s talents would be better 
trained in a field other than theater. To change 
these offered here are taught. It may also recom- 
mend placing a student on probationary status 
because of weakness displayed in the year’s work 
and may outline a program intended to aid in cor- 
rection of those weaknesses. A time-limit, usually 
one semester, may be set in which the deficiencies 
must be remedied.

Requirements for the M.A. Degree. Students en- 
rrolled in the graduate program in Dramatic Art are generally assumed to be training as stage directors or Ph.D. degree candidates. They will 
become eligible to apply for the M.A. degree upon completion of the Ph.D. qualifying examination. In 
exceptions, students interested in acting, design, playwriting, and dance may be accepted 
for work toward the M.A. degree only. Admission is 
by special arrangement, including, in the cases of 
actors and dancers, an audition, and in the cases of 
directors and playwrights, submission of port- 
folios of designs or manuscripts of original plays.

Requirements for the Ph.D. Degree. Graduate 
study including advanced and upper division work 
in the Department of Dramatic Art. During the first 
year, each student takes seminars in Modern cousin (222, 224, 225); the production course (274); one seminar of 
Theory of Criticism (225 or 227); the year-long 
course in directing (280A-280B); and one foreign 
language (may be taken concurrently). During the second year, two of the fifteen seminars (222, 223, 224, 225); the 
advanced course in directing (261A-261B); a course of special studies for one semester; the second 
part of the Theory of Criticism (226 or 227) and the second language exam. During the 
third year, course work as developed in conference 
with each student and includes A, written qualifying exami- 
nation; and the Ph.D. oral qualifying examination. During the fourth year, the completion of the Ph.D. 
dissertation.

For further details on the requirements for ad- 
vanced degrees, consult the Graduate Education 
section of this catalog and the department office in 
101 Dwinelle Annex.

The University Dance Theater

Under the direction of the Department of Dramatic 
Art, the University Dance Theater offers a major 
and workshop series of play productions, extend- 
ing into the laboratory of stage practice, the thea- 
etic and aesthetic, the critical and the philosophic, 
study in the departmental curriculum. These pro- 
grams are selected to present to the University 
community distinguished dramas of various peri-
ods and cultures. Participation is open to all reg- 
istered students, majors and nonmajors, interested 
in acting, design, or stagecraft.

The University Dance Theater presents an annual 
course of works choreographed by the faculty 
and performed by the students. Student works are 
presented each semester at choreographic work- 
shops. The Bay Area Repertory Dance Company, an 
in-residence dance group, performs throughout 
the year in schools and community centers on the 
West Coast and travels upon invitation to Europe for 
summer appearances.

Unit credit may be earned for work in drama and 
dance production. For further information inquire 
it the office of the Department of Dramatic Art.

Tryout Regulations
Tryouts for faculty and student-directed productions are held throughout each semester. All registered 
students may attend. If cast, all students must per- 
form. Tryouts are announced on the department’s bulletin boards.

Dramatic Art—Dance

Lower Division Courses

40A-40B. Beginning Modern Dance Technique. 
(1;1) Seven and one-half hours of studio per week. 
Must be taken on a passed/not passed basis. Prereq- 
usites: Audition and consent of instructor. Study in 
elementary body alignment and basic locomotor tech- 
niques, utilizing the body and extremities as a total.

41. Rhythmic Analysis for Dancers. (2) Three 
hours of lecture and studio per week. Prerequisites: 
40A-40B (may be taken concurrently) or consent of instructor. Study of 
the study of musical structure with emphasis placed 
on note values, rhythm patterns and dictation, score 
reading and phrasing. All work will be activated 
through structural improvisation. (SP) Marcus

42A-42B. Advanced Modern Dance Technique. 
(1;1) Course may be repeated for credit. Seven 
and one-half hours of studio per week. Must be taken on a passed/not 
passed basis. Prerequisites: 140A-140B, audition, or consent of instructor. Develop- 
ment of physical control through of-center move- 
ment and its utilization in spatial exploration. (F,SP) Sussel

43A-43B. Company Class. (1;1) Course may 
be repeated for credit. Seven and one-half hours of 
studio per week. Must be taken on a passed/not 
passed basis. Prerequisites: 142A-142B, audition, or consent of instructor. Devel- 
opment of postural control as a means of communi- 
ation in the theatre. Use of basic technical funda- 
mentals as a means of extending natural movement 
in rhythm, energy, and space with emphasis on style 
and qualitative analysis. (SP) Wood

44A-44B. Advanced Choreography. (3;3) Seven 
and one-half hours of lecture and studio per week. 
Prerequisites: 40A-40B, or consent of instructor. 
Principles and application of musical style, (Op- 
era, drama, musical, experimental, avant garde, 
post-modern.)

43A-43B. Company Class. (1;1) Course may 
be repeated for credit. Seven and one-half hours of 
studio per week. Must be taken on a passed/not 
passed basis. Prerequisites: 143A-143B, audition, or consent of instructor. Devel- 
opment of physical control through center and 
out-of-center movement. Exploration of existing 
stylistic forms and the study of movement as related 
to music and experimentation in their usage. (F) 
Marcus

146A-146B. Choreography. (3;3) Four and one-half 
hours of lecture and studio per week. Prerequisites: 
144, or consent of instructor. Analysis of theories of 
form and structure and work practical application in 
relation to content. (F,SP) Rogers

147. Dance Analyses. (3) Four and one-half 
hours of lecture and studio per week. Prerequisites: 
142A-142B and 144, or consent of instructor. Formerly 147A-147B 
Instruction in the methods and principles of class con- 
duction with emphasis placed on movement devel- 
opment. (F) Murota

148. Introduction to Movement Improvisation. (1) Three 
hours of studio per week. Must be taken on a 
passed/not passed basis. Prerequisites: Consent of in- 
structor. Study and analysis of stage movement 
through non-verbal approaches. (F) Rogers

149. Repertory and Production. (3) Course may be 
repeated for credit. Seven and one-half hours of com- 
pany class per week. Prerequisites: Consent of in- 
structor. Advanced students of dance are to be orga- 
nized as a company for the development of a dance 
repertory for public performance, the creation of new 
dance works, and the study of those already created. 

Graduate Courses

246A-246B. Advanced Choreography. (4,4) Seven 
and one-half hours of lecture and studio sessions per 
week. Prerequisites: 143A-143B, 146A-146B, and one 
year of graduate work. In-depth study and presentation 
of choreography and styles of theatre. (Opera, drama, 
musical, environmental, avant garde, post-modern.)

249. Dance Repertory and Production. (4) Course 
may be repeated for credit. Seven and one-half 
hours of lecture and studio per week. Prerequisites: Consent of 
instructor. Advanced students will be organized as a 
company for the development of a dance repertory 
for public performance, the creation of new dance 
works, and the study of those already created.

Dramatic Art—Acting and Speech

Lower Division Courses

10. Introduction to Acting. (3) Five hours of studio 
and one-half hours of lecture plus preparation and re- 
hearsals to be arranged. Prerequisites: Audition and consent of 
instructor. Instruction of elementary acting. (F,SP)

11. Scene Study and Voice Work. (3) Six hours of studio 
 sessions per week plus preparation and rehearsals 
to be arranged. Prerequisites: Audition and consent of 
instructor. Exploration of existing styles as they are 
used by trained performers and the use of vocal 
techniques. (F,SP) Egan

12. Beginning Study of Voice and Speech. (2) Two 
hours of studio sessions per week. Prerequisites: 
Consent of instructor. Beginning study of voice and speech 
in the interpretation of dramatic literature. (SP) Sussel

*On leave, spring
†On leave, fall
‡Recipient of Distinguished Teaching Award

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*Not offered 1991–92
†On leave, spring, fall
‡On leave, fall
Upper Division Courses

110A-110B. Intermediate Acting. (3-3) Course may be repeated for credit. Six hours of studio sessions per week plus preparation and rehearsals to be arranged. Prerequisites: Audition, one year of undergraduate work in acting, or consent of instructor. (F,SP) Berman, Sussel

111. Advanced Acting. (3) Course may be repeated for credit. Two 3-hour sessions per week plus preparation and rehearsal time. Prerequisites: Audition, two years of undergraduate work in acting or consent of instructor. (F,SP) Oliver

Graduate Courses

210. Advanced Acting: Company Class. (3) Course may be repeated for credit. Two 3-hour sessions per week, plus preparation and rehearsals. Prerequisites: Three years of undergraduate work in acting; voice and speech training; or consent of instructor. Advanced work in acting. (SP) Oliver

Directing

Upper Division Courses

*162. Fundamentals of Stage Directing. (3) Two 2-hour lectures/discussions per week plus preparation and rehearsals to be arranged. Prerequisites: 10, 45A or 45B, 20A-20B, 120; junior standing and consent of instructor. Beginning study of principles of stage composition, blocking, and analysis of dramatic texts for the director. Buchman

*163. Company Class for Directors. (3) Three hours of lecture and discussion per week. Prerequisites: Junior standing, 162, 2 years of acting, or consent of instructor.

Honors Courses

Upper Division Courses

H195A. Honors Course. (4) To be arranged. Prerequisites: Honors status in the Department of Dramatic Art. Independent study and conferences with faculty sponsor leading to the preparation of a major research paper on a single aspect of dramatic art or dance. (F,SP)

H195B. Honors Course. (4) To be arranged. Prerequisites: Honors status in the Department of Dramatic Art; successful completion of H195A and consent of the department. Development of subject studied in H195A, either as a bachelor's thesis or a laboratory project in acting, directing, playwriting, design, or dance. (F,SP)

Literature

Lower Division Courses

1A-1B. Introduction to Dramatic Literature. (4-4) Three hours of lecture and discussion per week. Prerequisites: Subject A, examination or course. Dramatic Art 1A or its equivalent is prerequisite to 1B. Reading and composition in connection with the study of dramatic literature. (F,SP)

20A-20B. Survey of World Drama. (3-3) Three 1-hour lectures per week. Prerequisites: Consent of instructor.

A. Aeschylus to Shakespeare

B. Shakespeare to Beckett (F) Ogden

*50A-50B. Theatre on Film. (3-3) One 1-hour lecture, one 2-hour laboratory, one hour discussion per week. The study of live theatre in all of its aspects through the use of film. Included will be plays, operas and dances on film and television. Emphasis is on film and television techniques. The focus of the course will range from issues of cultural significance prevalent in the making of theatre and the adaptive process of turning theatre into film, to the theory of film-making technique.

Upper Division Courses

120. Dramatic Theory. (3) Three hours of lecture per week. Prerequisites: 1A-1B and 20A-20B, or consent of instructor. Study of major documents in dramatic theory and criticism, to focus on: Aristotle, Corneille, Lessing, Artaud, Brecht, and modern performance analysis and theory. (F) Buchanan

122. Drama and Theatre in Ancient Greece and Rome. (3) Three hours of lecture per week. Prerequisites: 1A-1B and 20A-20B, or consent of instructor. Drama and the theatre of ancient Greece and Rome. (F) McCandless

123. Drama and Theatre in Europe: Middle Ages to 1600. British to 1642. (3) Three hours of lecture per week. Prerequisites: Dramatic Art 1A-1B, 20A-20B, or consent of instructor. English and continental drama, 1600-1700.

125. Drama and Theatre in Europe: 1600-1850. (3) Three hours of lecture per week. Prerequisites: Dramatic Art 1A-1B, 20A-20B, or consent of instructor. Dramatic literature of England and Europe from church drama to the High Renaissance. (F) McCandless

126. Drama and Theatre in Europe and United States; 1850-1918. (3) Three 1-hour lectures per week. Prerequisites: Dramatic Art 1A-1B, 20A-20B, or consent of instructor. Masterworks of the late 19th and early 20th century drama. (SP) Oliver

127. Drama and Theatre: 1918 to Present. (3) Three 1-hour lectures per week. Prerequisites: Dramatic Art 1A-1B, 20A-20B, or consent of instructor. Contemporary drama.

129. Senior Proseminar. (3) May be repeated for credit subject to acceptance of petition. Three 1-hour lectures per week. Prerequisites: 120, senior standing, or consent of instructor; enrollment is restricted to 15. Studies of the works of a major playwright, choreographer, or designer, and a period of artistic activity in the theatre. (SP) Buchman

Playwriting

Upper Division Courses

139. Playwriting. (3) Three hours of lecture and discussion per week. Prerequisites: Consent of instructor. Formerly 139A-139B. Practice in the fundamentals of dramatic composition. Group readings and discussion of written work. (F) Rosenberg

Production

Lower Division Courses

45A-45B. Theatre in Production: Beginning Study. (3-3) Three 1-hour lectures per week and laboratory to be arranged. Prerequisites: Consent of instructor. 45A. Basics of stagework and production management, including set and costume construction, props, make-up, sound, stage management, theatre operations. Related to department's productions. 45B. Basics of production concept. A study of the roles of the producer, director, choreographer and designer in the making of a theatrical production. Related to department's productions. (F,SP) Codd

Upper Division Courses

170. Theatre Laboratory. (1) Course may be repeated for credit. To be arranged. Must be taken on a pass/fail 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 scenery or costume shop. (F,SP)

171. Theatre Performance. (1) Course may be repeated for credit. To be arranged. Must be taken on a pass/fail basis. Prerequisites: Consent of instructor. Practice in acting and/or dance in Dramatic Art productions. (F,SP)

172A-172B. Theatre in Production: Intermediate Study. (3-3) Two 1½-hour lectures per week and laboratory to be arranged. Prerequisites: 45A-45B and consent of instructor.

A. Problems in concept realization; Intermediate study of production techniques and procedures. (F)

B. Dynamics of production management; intermediate study of theatre business and administration. (SP) (SP) Codd

180. Advanced Production Study. (3) Course may be repeated for credit. To be arranged. Prerequisites: 45A-45B and one or more of the following department courses: 172A-172B, 173A-173B, 174A-174B, 175A-175B. Consent of instructor. Supervised internship in department-sponsored major productions to include production research, management and design. (F,SP)

181. Theatrical Realization of Dramatic Texts. (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 attending rehearsals; coaching sessions, and the performance of the play or concert. The course will be taught by faculty involved in the major productions. (F,SP)

196. University Theatre Workshop. (4) To be arranged. Prerequisites: Senior standing; 162 or 163 or equivalent and consent of production chairman. Individual directing projects to include research, auditions, casting and rehearsal; culminating in public performances as scheduled by the department. (F,SP)

Scenography and Design

Upper Division Courses

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) Travis

175A-175B. Scenography: Lighting Design for the Theatre. (4-4) Three hours of lecture per week and lab 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)

*177. Visual Arts in Theatre. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: Consent of instructor. Survey of visual arts as components of style in theatre.

178. History of Fashion and Theatrical Design. (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) Travis

Special Studies

Upper Division Courses

198. Directed Group Study for Undergraduates. (1-3) Course may be repeated for credit. Must be taken on a pass/fail basis. Enrollment is restricted by regulations listed in the General Catalog. Supervised group study of special topics, subject to approval by the chair. (F,SP)

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Individual study. Must be taken on a pass/fail basis. Prerequisites: Eight or more units in the Department of Dramatic Art, with an average grade of B. Restricted to honor students. Enrollment is restricted by regulations listed in the General Catalog. Reading and conference with an instructor in an area not corresponding with any regular course. (F,SP)
Dutch Studies

(College of Letters and Science)

Group Major Office: 5329 Dwinelle Hall, 540-3010

Professors: Svetlana Aperis, Ph.D. (History of Art); William J. Bouwe, Ph.D. (History); Alan S. Crandall, Ph.D. (Music); James Mawor, Ph.D. (History of Art); Dunbar Ogden, Ph.D. (History of Art); Johan P. Snapper, Ph.D. (German, Queen Beatrice Professor); Blake Lee Spaith, Ph.D. (German, Comparative Literature); Frits Staal, Ph.D. (South and Southeast Asian Studies); Jan de Vries, Ph.D. (History); Associate Professor: Thomas F. Shannon, Ph.D. (German)

Lecturers: Jeanne van Oosten, Ph.D.; Peter Paul Rubens Professor: Reginald de Schryver, Ph.D. (Leuven, 1982); Walter Preverter, Ph.D. (Ghent, 1983); Holand Willems, Ph.D. (Brussels, 1984); Carlos Tindemans, Ph.D. (Anwerp, 1985); Marcel Janssen, Ph.D. (Leuven, 1986); Ferdinand J. de Hen, Ph.D. (Ghent, 1997); Hugo Baetens Beardsmore, Ph.D. (Brussels, 1988); Adriaan van der Heide, Ph.D. (Ghent, 1989); Eugene Rosens, Ph.D. (Leuven, 1990)

Adviser: Mr. Snapper

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. Since the program is both specialized (in dealing with one country) and broad (in its many-sided approach to the subject), it is recommended that the student also prepare a related discipline so that the group major in Dutch studies may constitute the focal point to a larger area of interest. Suggested related fields of concentration are Comparative Literature, German, History, History of Art, Linguistics, and South and Southeast Asian Studies (e.g., Indonesian).

See Department of German for a list of courses.

The Minor

(College of Letters and Science)

Group Major Office: 5329 Dwinelle Hall, 540-3010

Professors: Svetlana Aperis, Ph.D. (History of Art); William J. Bouwe, Ph.D. (History); Alan S. Crandall, Ph.D. (Music); James Mawor, Ph.D. (History of Art); Dunbar Ogden, Ph.D. (History of Art); Johan P. Snapper, Ph.D. (German, Queen Beatrice Professor); Blake Lee Spaith, Ph.D. (German, Comparative Literature); Frits Staal, Ph.D. (South and Southeast Asian Studies); Jan de Vries, Ph.D. (History); Associate Professor: Thomas F. Shannon, Ph.D. (German)

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See Department of German for a list of courses.

The Major

Lower Division. Dutch 1, 2, 3, or equivalent.

Upper Division. The student is expected to complete a minimum of 30 upper division units, but no more than 36 from those courses listed below. Of the following are required:


Additional courses are to be selected from the following list to complete the major: Dutch (see German Department for complete description of these courses) 107, 120, 160, 175, 190, 198; German 270; Comparative Literature 180, 400, 400U, 170; Linguistics 165, 244; History 183A-183B.

Honors Program. Students accepted in the honors program will enroll in Dutch 191B (1-4 units) for a total of four units and will be expected to write a senior 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 (Advanced Dutch); Dutch 130 (Advanced Composition); Dutch 170 (Culture and Institutions) 2) Two additional upper-division courses from the following: Dutch 107 (Structure of Modern Dutch); Dutch 120 (Conversational Dutch); Dutch 140 (Dutch Literature); Dutch 150 (Introduction to Literature); Dutch 180 (Middle Dutch).

A letter grade of C or better is required for each upper-division course applied to the minor.

East European Studies

(College of Letters and Science)

Office: Slavic Languages and Literatures, 5416 Dwinelle Hall, 542-2979

The Department of Slavic Languages and Literatures offers courses in several Slavic and non-Slavic languages and literatures, both for those pursuing the department's own degree and for interested students from other departments. There is no undergraduate major or graduate program in East European Studies. Languages taught have included Hungarian, Lithuanian, Armenian, and General Studies as staffing permits. For further information, see East European Studies course listings following Slavic Languages and Literature.

Economics

(College of Letters and Science)

Department Office: 787 Evans Hall, 542-0822
Chair: Robert M. Anderson, Ph.D.

University Professor: Gerard Debreu, Sc.D., University of Paris. Mathematical economics.

Pranab K. Bardhan, Ph.D. Cambridge. Development, economics.
Moses Abramovits, Ph.D. University of Chicago. Development, international economics.
Yasushi Fudoh, Ph.D. University of Tokyo, Japan. Development, international economics.
Richard Gilbert, Ph.D. Stanford University. Industrial organization.

*On leave, spring
†Recipient of Distinguished Teaching Award
Admission to the Major

The major may be declared in the sophomore or junior year, and students are admitted in either semester. A departmental application is required. Berkeley students are asked to file an application for admission in 789 Evans Hall the semester before admission is desired. Although many factors are considered in determining admission to the economics major, a main criterion is academic performance as measured by GPA in prerequisite courses. Applications will be accepted only from students who have satisfied the following prerequisites:

- The college’s reading and composition requirement and the University’s American history requirement, and completion of between 40 and 84 semester units of college credit. Unfortunately, because of large enrollment and limited resources available, it has proved necessary to restrict the number of economics majors. Prospective majors are encouraged to read the Economics Major’s Handbook, which contains up-to-date information about economics courses and requirements. Handbooks are available in 787 Evans Hall.

Undergraduate Major Program

Prerequisites: The College of Letters and Science reading and composition requirement; the University's American history requirement; one year of calculus or one semester of calculus and one semester of statistics (see handbook); Economics 1; and Economics 100A, 100B, or 101A.

Major Requirements: The department has submitted a new plan which is not yet approved. The new plan would require six upper division courses in addition to the basic theory courses.

Departmental Honors

Students interested in graduating with honors in economics should consult with a faculty adviser no later than the 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 academic record overall and in the major. The senior thesis may be an extension of a seminar paper prepared under the continued guidance of a faculty member through enrollment in H185. Students should refer to the Economics Major’s Handbook for possible changes in these requirements.

Advising. All majors are encouraged to consult with faculty advisers frequently in planning their programs. Students planning to do graduate work in economics should consult with more quantitative courses in economics.

Graduate Program

The graduate program trains doctoral students interested in pursuing advanced study and conducting original research in economics. Detailed information concerning admission, financial aid, and degree requirements is contained in the brochure on graduate studies. The requirements for an M.A. are: (1) completion of two written field examinations. (F,SP)

Law and Economics

The School of Law and the Department of Economics sponsor a concurrent program which permits students to study for the degree of Juris Doctor while preparing for the Ph.D. degree in economics. In four years a well-prepared student can receive the law degree and also complete the pre-thesis requirements for the Ph.D. Further information may be obtained from the graduate assistant, Department of Economics.

Law and Economics

Chairperson. Seminars for the group study of selected problems. (F,SP) Letiche

Upper Division Courses

100A. Economic Analysis. (4) Hours of lecture and two hours of section per week. Prerequisites: 1 Resource allocation and price determination. (F,SP) Margossian, Burket

100B. Economic Analysis—Macro. (4) Three hours lecture and two hours of discussion per week. Prerequisites: 100A and one semester of calculus. Basic economic theory with emphasis on microeconomic principles. (F,SP) Rabin, Staff

101B. Economic Theory—Macro. (4) Three hours lecture and two hours discussion per week. Prerequisites: 101A and one semester of calculus. A study of the theories of the determination of national income, employment, and price levels, with attention to the effects of monetary and fiscal policy. (F,SP) D. Romer, Motley, Segall, Burket

102. Aggregate Economic Theory and Policy. (3) Three hours of lecture per week. Prerequisites: 100B or 101B. Basic topics in macroeconomics. In the past the course has covered such topics as theoretical challenges to the Keynesian model and determinants of productivity growth. (F,SP)

103. Introduction to Mathematical Economics. (3) Three hours lecture per week. Prerequisites: Math 50A-50B. Formerly 104. Selected topics illustrating the application of mathematics to economic theory. This course is intended for upper-division students in Mathematics, Statistics, the Physical Sciences, and Engineering, and for economics majors with adequate mathematical preparation. A background in linear algebra is required. Also listed as IDS 103 and Math 103. (F,SP) Debreu

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. (F,SP) Reich

106. Economics of Marxism. (3) Three hours of lecture per week. Prerequisites: 100A-100B or 101A-101B. The economic thought of Marx and his followers, emphasizing the contemporary relevance of the analyses. (F,SP) Reich

107. Political Economy and History of Economic Thought Seminar. (4) Three hours of seminar per week. Prerequisites: 105 or 109 and consent of instructor. A seminar paper is required. (F,SP)

108. Critique of Modern Economic Theory. (1.5) One 1½ hours lecture per week. Prerequisites: 100A-100B or 101A-101B. A critical analysis of contemporary economic theories with emphasis on nonconventional approaches to economics. (F,SP)

109. Introduction to Political Economy. (3) Three hours of lecture per week. Prerequisites: 100A-100B or 101A-101B. A survey of major issues involving the relationship between power and the economy. (F,SP)

111A. European Economy from the Fall of Roman Empire to Industrial Revolution. (3) This course is equivalent to History 111A; students will not receive credit for both courses. Three hours of lecture per week. Prerequisites: 1. Survey of the economic and
111B. The Industrial Revolution and the Origin of the Modern Economic System. (3) This course is equivalent to History 158B; students will not receive credit for both courses. Three hours of lecture per week. Prerequisites: 1. The rise of the European economy to world dominance in the period from 1750-1914. (F,SP)

112. European Economic History Seminar. (4) Three hours of seminar per week. Prerequisites: 111A or 111B and consent of instructor. Seminar paper is required. (F,SP) Sutch

113. American Economic History. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1. A survey of trends in the American economy; emphasis on factors explaining economic growth and on the changing distribution of the gains and losses associated with growth. This course is equivalent to History 135; students will not receive credit for both courses. (F,SP) Sutch

114. American Economic History Seminar. (4) Three hours of seminar per week. Prerequisites: 113 and consent of instructor. Seminar paper is required. (F,SP) Sutch

115. The World Economy in the Twentieth Century. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100A or 101A. The organization and structure of production in the U.S. economy. Determinants of market structure, business behavior, and economic behavior. Implications for antitrust policy. (F,SP) Keeler

121. Industrial Organization and Public Policy. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100A or 101A. The organization and structure of production in the U.S. economy. Determinants of market structure, business behavior, and economic behavior. Implications for antitrust policy. (F,SP) Keeler

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. (F,SP) Keeler

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. (F,SP) Halff

124. Special Topics in Industrial Organization. (3) Three hours of lecture per week. Analysis of market structure and performance in selected industries. See course announcement for current topics. (F,SP) Dekel-Tabak

125. Economics of the Environment. (3) Three hours of lecture per week. Prerequisites: 100A or 101A. Analysis of public policy measures designed to preserve and improve human environments. (F,SP)

131. Public Sector Microeconomics. (3) Three hours of lecture per week. Prerequisites: 100A or 101A-101B. The economic and policy analysis of government expenditures, taxes, and intergovernmental fiscal relations. (F) Staff

132. Seminar in Public Sector Economics. (4) Three hours of seminar per week. Prerequisites: 131 and/or consent of instructor. Enrollment will be limited. A seminar paper is required. (F,SP)

136. Monetary Theory and the Banking System. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 100B or 101B. Survey of money, interest and income theories. Depository institutions and their functions, Federal Reserve System and the supply of money. (F,SP) Crane, Staff

137. Aggregate Economics Seminar. (4) Three hours of seminar per week. Prerequisites: 102 or 136 and consent of instructor. Enrollment will be limited. A seminar is required. (F,SP) Obstfeld

141. Economic Statistics and Econometrics. (4) 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 model, critical evaluation of results of empirical economic research and exercises in applied econometrics. (F,SP) Train

151. Economics of Trade Unionism and Collective Bargaining. (3) Three hours of lecture per week. Prerequisites: 100A-100B or 101A-101B or consent of instructor. The social and economic background of labor legislation and the economics of collective bargaining. (F,SP) Staff

152. Wage Theory and Policy. (3) Three hours of lecture per week. Prerequisites: 100A-100B or 101A-101B. The theory and the determination of wages and employment. Application of the theory to policy analysis. (F,SP) Staff

153. Labor Economics Seminar. (4) Three hours of seminar per week. Prerequisites: 151 or 192 and consent of instructor. Topics in labor economics. Seminar paper required. (F,SP) Brown

154. Women in the Labor Force. (3) Three hours of lecture per week. Prerequisites: 100A-100B or 101A-101B. An analysis of the changing role of women in the U.S. economy. (F,SP) Staff

155. Urban Economics. (3) Three hours of lecture per week. Prerequisites: 101A-101B. Application of economic theory to urban problems. Topics covered include location theory, housing, transportation, and the fiscal problems of city governments. (F,SP)

156. Urban Economics Seminar. (4) Three hours of seminar per week. Prerequisites: 155 and consent of instructor. Seminar on problems of the urban economy. A seminar paper is required. (F,SP) Keeler

157. Health Economics. (3) Three hours of lecture per week. Prerequisites: 1. An economic analysis of policies and institutions in the U.S. health care sector. Topics covered include the supply and demand for health services, conceptual and policy issues relating to the provision of health insurance, and economic analysis of efficient regulatory policies toward the health care sector. (F,SP) Keeler

158. Economics of the Soviet Union. (3) Three hours of lecture per week. Prerequisites: 1. The Soviet economy, its growth, institutions, problems. Other Soviet-type economies. (F,SP) Grossman

160. Special Topics in Economic Systems. (1.5) One and one-half hours of lecture per week. Prerequisites: 1. Recommended: 161 or 162. As announced in the department course descriptions. (F,SP)

164. Economic Systems Seminar. (4) Three hours of seminar per week. Prerequisites: 161 or 162 or 163 and consent of instructor. A seminar paper will be required. (F,SP)

171. Economic Development. (3) Three hours of lecture per week. Prerequisites: 100A-100B or 101A-101B. Problems of economic development in the economies of developing countries, including such problems as aging and pensions and absorption of the Baby Boom into the labor market. (F,SP) Lee

181. International Trade. (4) Three hours of lecture and one hour discussion per week. Prerequisites: 100A-100B or 101A-101B. The theory of international trade and its applications to tariff protection. (F,SP) Obstfeld

182. International Monetary Economics. (4) Three hours of lecture and one hour discussion per week. Prerequisites: 100A-100B or 101A-101B. The balance of payments, the determination of the trade balance and income under fixed and floating exchange rates, money and prices in open economies, the internationalization of financial markets and its implications, hours to be announced. Interdependence, capital flows, and the determination of the exchange rate. (F,SP) Frankel

193. International Economic Seminar. (3) Three hours of seminar per week. Prerequisites: 181 and 182 and consent of instructor. Seminar paper is required. (F,SP) Frankel, Eichengreen

199A. Senior Honors Thesis. (1-3) Number of hours to be announced. Must be taken on a passed/not passed basis. Prerequisites: Senior honors candidates only (students with GPA of 3.50 or better permission of instructor). Preparation for writing a thesis, finding and organizing a topic, gathering data and getting started. H199A is not prerequisite to H199B. (F,SP) Goldman

199B. Senior Honors Thesis. (1-3) Number of hours to be announced. Must be taken on a passed/not passed basis. Prerequisites: Senior honors candidates only (students with GPA of 3.50 or better permission of instructor). Writing a thesis and the supervision of a faculty member. Applications and details through the departmental undergraduate office. H199A is not prerequisite to H199B. (F,SP) Staff

197. Field Studies. (1-4) Course may be repeated for credit. Number of hours to be announced. Must be taken on a passed/not passed basis. Prerequisites: Upper-division standing. Written proposal must be approved by Department Chairperson. Supervised field studies in economics. Projects may be initiated by the students. (F,SP) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. Number of hours to be announced. Must be taken on a passed/not passed basis. Prerequisites: Upper-division standing and consent of instructor. Written proposal must be approved by Department Chairperson. Seminars for the group study of selected topics, which will vary from year to year. Topics may be initiated by students. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Number of hours to be announced. Must be taken on a passed/not passed basis. Prerequisites: Upper-division standing. Written proposal must be approved by Department Chairperson. Enrollment is restricted. (F,SP) Staff

Graduate Courses

200A. Fundamentals of Economic Theory. (2) Two hours of lecture per week. Prerequisites: Primarily for graduate students outside the Department of Economics. Students with a strong background in eco-
nomics and mathematics should enroll in 201A-201B and 202A-202B rather than 200A-200B. Microeconomics—the behavior of firms and households and the determination of prices and resource allocation in a market economy. (F,SP)

200B. Fundamentals of Economic Theory. (2) Two hours of lecture per week. Prerequisites: Primarily for graduate students outside the Department of Economics. Students with strong background in economics and mathematics should enroll in 201A-201B and 202A-202B rather than 200A-200B. Macroeconomics-determination of national income, employment, price level, growth and distribution. (F,SP)

201A-201B. Economic Theory. (4-4) Three hours of lecture and two hours of section per week. Prerequisites: 100A-100B or 101A-101B or equivalent. Mathematics 50A or equivalent. Basic preparation for the Ph.D. program including: the theory of the firm and the consumer, general equilibrium, capital theory, and welfare economics. (F,SP) Goldman, Staff; Farrell, Rabin

201C. Linear Economic Models. (3) Two hours of lecture per week. Prerequisites: 201A-201B. Linear economic models, linear programming, activity analysis, introduction to non-linear programming. (F)

202A-202B. Macroeconomic Theory. (4-4) Three hours lecture and two hours per week. Prerequisites: 100A-100B or 101A-101B or equivalent. Mathematics 50A or equivalent. Basic preparation for the Ph.D. program including: the theory of the firm and the consumer, general equilibrium, capital theory, and welfare economics. (F,SP) Rognlie, D. Romer

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. (SP) Staff

203. Advanced Topics in Economic Theory. (3) Two hours of lecture per week. Prerequisites: Consent of instructor. See department course description each semester. (F)

204. Mathematical Tools for Economics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: To be taken concurrently with 201A or consent of instructor. A review and discussion of the basic mathematics needed for advanced work in economics. (F,SP) Dekel-Tabak

205. History of Economic Thought. (3) Two hours of lecture per week. Topics in the history of economic analysis. (F,SP)

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 theory as possible, including theories of preferences, utility, demand, personal probability, games and general equilibrium. Also listed as IDS 213A-213B and Math 213A-213B. (F,SP)

208. Seminar In Mathematical Economics and Advanced Economic Theory. (3) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: Consent of instructor. (F,SP) Dekel-Tabak, Rabin

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 game theory and its application to such problems as oligopoly pricing, non-cooperative bargaining, predatory pricing, and optimal auctions. The focus will be on game theory as a modelling process as opposed to a body of known results. (F) Dekel-Tabak

209B. Mechanism Design and Agency Theory. (3) Two hours of lecture per week. Prerequisites: 201B and 209A or consent of instructor. Optimal design of markets, the anatomy of information and imperfect observability. Course begins with the "classical" principal-agent problem and will then develop its applications to the "implicit contracts" theory of agency and to the choice of government policy in regulated industries. Second half treat design of auctions, regulations with costly or imperfect monitoring, mechanism design with limited contracts, and other topics on instructor. (SP) Rabin

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. (F,SP) Eichengreen, C. Romer

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. (F,SP)

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. (F,SP)

211. Seminar in Economic History. (3) Course may be repeated for credit. Two hours of seminar per quarter. Prerequisites: Consent of instructor. (F,SP) C. Romer, Eichengreen

215A-215B. Political Economy. (3;3) Two hours of lecture per week. Systematic study of the economy in interaction with other aspects of society; contemporary and historical institutional approaches; the study of crises. 215A is not prerequisite to 215B. (F,SP) Reich

215C. Selected Topics in Political Economy. (3) Two hours of lecture per week. Special topics, varying from year to year. (SP)

216. Seminar in Political Economy. (3) Course may be repeated for credit. Two hours of seminar per quarter. Prerequisites: Consent of instructor. Reich

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. Public policies related to the promotion or restriction of competition. (F,SP) Farrell

220B. Industrial Organization. (3) Two hours of lecture per week. Prerequisites: 210A. Conduct of competition. Continuation of 220A. The characteristics of regulated industries and the consequences of regulation for economic performance. (F,SP) Gilbert

220C. Special Topics in Industrial Organization. (3) Two hours of lecture per week. Prerequisites: See course announcement. See course announcement for current topics. (SP)

221. Seminar in Industrial Organization: Regulation and Public Enterprise. (3) Course may be repeated for credit. Two hours seminar per quarter. Prerequisites: Consent of instructor. (F,SP) Farrell, Keeler

224. Economics of Institutions. (3) Two hours of lecture per week. This course develops the proposition that economic 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 models of organization are assessed with respect to their comparative contracting properties. (F,SP) Williamson

225. Doctoral Seminar in Institutional Analysis. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken in year unsatisfactory basis. Prerequisites: Doctoral standing or consent of instructor. The seminar features current research of faculty, from UCB 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 main-
251. Seminar in Labor Economics. (Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Seminar for students desiring the doctoral dissertation level. (F.S.P) Brown, Dickens)

255. Urban Economics. (Two hours of lecture per week. Prerequisites: 201A or consent of instructor. Formerly 255A. Application of economic theory to study of activity and residence in cities. (F.S.P)

258. Seminar in Urban Economics. (Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Faculty-student research and dissertation workshop. (F.S.P)

260A-260B. Economic Systems. (Two hours of lecture per week. Prerequisites: 260A is prerequisite to 260B. Methods and problems of comparing economic systems; their institutions, ideologies, performance, and evolution. (F.S.P) G roses)

260C. Economic Systems. (Two hours of lecture per week. Case studies of the Soviet Union and other non-market economies. (SP)

261. Seminar in Economic Systems. (Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. (F.S.P) Tyson)

270A-270B. AnalytIcs of Economic Development and Planning. (Two hours of lecture per week. Prerequisites: 201A-201B, 202A-202B, 210C, 210C. Basic macroeological planning with investment project analysis. (SP)

270D. Special Topics in Development. (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. (Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. (F.S.P) Barman, Fishlow)

275A. Economic Demography. (Two hours of lecture per week. Economic consequences of demographic change in developing and developed countries including capital markets, labor markets, migration, and urbanization. Economic determinants of fertility, mortality and migration. (F.S.P)

275B. Selected Topics in Economic Demography. (Two hours of lecture per week. A review of recent literature in selected areas of economic demography; content will range from year to year. (F.S.P)

280A. International Economics. (Two hours of lecture per week. The world economy as a general equilibrium system. The theory of international economics, trade policy. (F.S.P) Barman)

280B. International Economics. (Two hours of lecture per week. 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 monetary policy. (F.S.P) Oberby)

280C. International Economics. (Two hours of lecture per week. Prerequisites: 280B. This course is an empirical treatment of open-economy macroeconomics and finance. Topics include trade elasticities, the development of national labor and balance of payments, and foreign exchange. (F.S.P) Frankel)

280D. Special Topics in International Economics. (Three hours of lectures per week. Topics to vary. See departmental course announcement for current topics and prerequisites. (F.S.P) Wyplosz

281. Seminar in International Trade and Finance. (Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. (F.S.P) Rogoff, Frankel)

290. Doctoral Thesis Workshop. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Seminar for third-year doctoral students in the early stages of thesis research. (F.S.P) Stock

295. Survey of Research in Economics. (Two hours seminar per week. Must be taken on a pass/fail basis. Presentations by departmental faculty on current research directions in different fields of economics. (F.S.P) Anderson)

296. Special Topics in Economics. (Two hours of lecture per week. Prerequisites: Consent of instructor. Topics of different sections to be announced annually. (SP) Persson

298. Directed Group Study for Graduates. (4) Course may be repeated for credit. Two hours of seminar and one hour of consultation per week. Prerequisites: Consent of instructor. Seminar for third-year doctoral students who desire to do special work in a particular field. (F.S.P) Staff

602. Individual Study for Doctoral Students. (1-9) May not be used for unit or residence requirements for the doctoral degree. Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Open to candidates for the Ph.D. degree who have qualified the dissertation and who are engaged in research for the thesis, and in special cases, with consent of the instructor in charge, to graduate students who desire to do special work in a particular field. (F.S.P) Staff

Professional Courses

301. GSI Practicum. (6) One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as graduate student instructor in department, consent of graduate advisor. (F.S.P) Pierce

Upper Division Courses

IDS 170. Economics of Organization. (3) Two 11/2 hours of lecture per week. Prerequisites: 100 or 101; or BA 110 or equivalent; or consent of instructor. This course presents general welfare concepts which explain what economic activity is organized in firms, why firms are vertically integrated, and why there are limits to the growth of firms. Other forms of economic organization, such as the partnership, the labor-managed firm, and cooperatives, will also be considered. Sponsoring departments: Economics and Business Administration. (SP)

IDS 180. Economic and Biological Feedback Systems. (3) Three hours lecture per week. Prerequisites: Mathematics 51 or equivalent. Feedback systems: Analysis of exogenous changes, estimation, simulation and prediction. Examples in government, economics, business and biology. Growth dynamics, phase-plane methods, state-variables, stabilizing and destabilizing feedback systems, and computer simulation of large systems. Sponsoring department: Economics and Electrical Engineering and Computer Science. (F)
For more information regarding this program, please see the undergraduate minor assistant in 1600 Tolman Hall.

Graduate Program
For a description of the graduate program in education, see page 75.

Education

Lower Division Courses
40. Experiencing Education: Race and Ethnicity Inside Schools. Challenging assumptions per week. Racial and ethnic minorities in American schools and colleges through case studies of Native Americans, Italians, African Americans, and Mexican Americans. Policies, practices, ideologies, expectations, and outcomes from the perspective of the dominant and majority groups. (F,SP) Clifford, Noguera

60. Preparation for Leadership. (2) Two hours lecture per week. Must be taken on a passed/not passed basis. The purpose of this course is to provide lower division students an introduction to the theory and practice of leadership and professional development. It emphasizes leadership opportunities at UC Berkeley and will assist students to prepare to take on leadership positions. (SP) Reynolds

98. Directed Group Study. (1-4) Course may be repeated for credit. Group meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. (F,SP) Staff

Upper Division Courses
156. Education and American Society. (3) Two 1 1/2-hour lectures per week. Prerequisites: Upper division standing or consent of Instructor. Examination of educational institutions in America. Emphasis on the shifting educational responsibilities of family, 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. Also listed as IDS 156 and Social Science 156. (F) Clifford

*190. Current Issues in Education. (4) Two 1 1/2-hour lectures and discussion per week. Students will examine current issues in education. Coursework will begin with a critical analysis of the history of education. Students will also examine different educational philosophies, purposes, and methods. Students will also use this material to support their professional development 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.

196. Teaching One-on-One: Principles of Tutoring. (2) One 2-hour lecture 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 approaches for improving communication and building trust in the tutoring relationship. (SP) Ruth

197. Field Studies. (1-4) Course may be repeated for credit. Field study. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. University organized and supervised field programs involving experiences in schools and school-related activities. (F,SP) Staff

199. Supervised Independent Study and Research. (2,3) One 1-hour lecture and one 1-hour discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Must be approved for credit. Independent study. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. (F,SP) Staff

Graduate Courses
288A. Research on Teachers and Teaching. (3) Three hours of lecture and discussion per week. Introduction to the research on teachers and teaching, from a variety of social and behavioral science disciplines. Emphasis on qualitative methods and perspectives being pursued. Considers such issues as teaching effectiveness, classroom interactions, and continuity. (F,SP) Staff

290A. Educational Administration. (1-4) Staff

290B. Education in Language and Literacy. (1-4) Staff

290C. Education in Mathematics, Science, and Technology. (1-4) Staff

290D. Educational Psychology. (1-4) Staff

290E. Social and Cultural Studies in Education. (1-4) Staff

291A. The Educational System of the United States. (3) Three 1-hour lecture/presentation and one 1-hour discussion per week. Course examines the educational system in the United States and the political, social, and cultural forces shaping it. Also listed as IDS 291A. (F) Geiger

291B. Education as an Institution. (3) Course may be repeated for credit. Two 1 1/2-hour lecture and discussion per week. A departmental core course. The course examines the environment and structure of formal education systems. Constraints surrounding schools and colleges, impact of family, class and mass media. Opportunities for employment and training both inside and outside these formal systems. The analysis of education and the professionalism of teaching. The role of universities to improve education. (F) Little

291C. Cognition, Learning, and Instruction: Ages 12 and up. (3) One 3-hour lecture/discussion per week. Explores the various aspects of thinking and knowing in learning, and the implications of these theoretical views on instruction. The perspectives taken and elaborated on is basically constructivist. Examined are the development of knowledge frameworks, and the ways in which they compare and contrast learning and thinking in different subject areas within which schooling can enhance or inhibit learning. Various methodologies designed to gather information about these issues are also explored. (SP) Frederickson, White

291D. Cognition, Learning, and Instruction: Childhood and Adolescence. (3) One 3-hour lecture per week. Explores a variety of theoretical perspectives on the nature and acquisition of knowledge, together with their implications for instruction. While a constructivist development of knowledge frameworks, other approaches considered include behaviorism, social constructionism, and artificial intelligence. Research methods and frameworks associated with these approaches are discussed as well. (F,SP) Staff

292A. Perspectives on the Education of Linguistic Minorities. (3) Three hours of lecture and discussion per week. The social, political, linguistic and pedagogical issues associated with educating students who do not speak the societal language are examined 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. (SP) Valdes

293A. Data Analysis in Education Research. (4) Two 2-hour lectures per week. Prerequisites: Consent of instructor. Introduces students to quantitative sta-
181. Television as Educator: Schools, the New Media and Cultural Change. (4) One 2-hour lecture and one 2-hour discussion per week. This course concerns the influences of commercial and public television on human learning and development. Particular attention is given to research and theory relating television to changes in orientations to classroom lessons, levels of learning in the classroom, sociocultural and identity, and cultural understandings. Potential influence of the emerging "New Media"—the video computer satellite news—will be considered. (SP)

*280F. Dissertation Seminar. (3) Course may be repeated for credit. One 3-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Recommended for doctoral students preparing dissertation proposals and dissertations.

281. Social Foundations of Education for Teachers. Two hours of lecture per week. Prerequisites: Admission to a teacher education program. Relations of the American educational system to the society and culture and considerations of schools as social systems, with particular reference to the relevant literature in the field. The first meeting will be in the sixth week of the semester. (SP)

*282A. Social Contexts of Classroom Learning: Family, Community and Society. (3) One 3-hour seminar 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 sociocultural processes and family-classroom articulations.

283A. Social Theory: On Schooling. (3) One 3-hour seminar per week. Social theorists have devoted extensive attention to the institution of schooling—as a function of functional-structural, Marxist, phenomenological and poststructuralist theorists who argue these and other positions. (F) Lave

283B. Issues in Education: Historical Perspectives. (3) Three hour of lecture per week. Historical perspectives on various current issues in education. Examples of issues to be analyzed are the integration of ethnic groups, the political-economy of schooling, educational psychology, science and society, and conflicts among socio-economic groups. (SP) Downey

283C. Seminar in the Historiography of Education—Selected Topics. (3) Three hour of seminar per week. In depth study of one or more topics in the history of education with emphasis upon original research by students in independent study and shared discussion and critiques in the seminar. Consideration of research methods in history of education. (F,SP) Hurst

283D. Popular Education. (3) Two 2-hour lectures per week. The empirical movement and its associated research model—popular education—will be placed in historical and sociocultural contexts. The emphasis will be on how research and theory can become part of a social movement and its associated research model—popular education. (SP) Hurst

284A. Philosophy of Education. (3) Three hour of lecture per week. Philosophical analysis applied to current educational problems and key concepts. (SP) Jarrett

284B. Value Education. (3) One 3-hour seminar per week. Theoretical analysis of the value orientations of adults through democratic structured cooperative study and action directed toward achieving more just and peaceful societies within a life-sustaining global environment. The theoretical development of theory and practice as well as the current state of this major international educational movement and its associated research model—participatory research—will be examined using case studies and theoretical works. Our principal method will be dialogue. (SP) Hurst

285B. Sociology of Education. (3) Three hour of lecture per week. Theory classroom research and their implications for the sociology of education. (SP) Hurst

289. Democracy and Education. (4) Two hours of lectures per week. Prerequisites: Junior standing or consent of instructor. Education as a vehicle for furthering the ideals of democratic societies—critical study of principles, theories, and practices of democratic education, and skills to empower a citizenry dedicated to achieving equality, justice, and peace in the world. (F) Hurst

Graduate Courses

*280A-280B. Proseminar in Sociocultural Critique of Education. (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. These interdisciplinary seminars address a series of questions. In what ways can philosophical, sociological, anthropological, historical, and psychological forms of inquiry be brought together to bear on the analysis of learning, on schooling, and on education more generally? What do we mean by critical and interpretive theories, and what are their implications? How can education come to constitute itself other than in its current form? (SP)

*280C. Research Apprenticeship Seminar I. (3) One 3-hour seminar per week. Prerequisites: Second year standing 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 spend about 50 hours on the field research. (F,SP) Hurst

*280D. Research Apprenticeship Seminar II. (3) One 3-hour seminar per week. Prerequisites: 280C or consent of instructor. This is the second in a sequence of courses on the practice of research. In the first semester students work with faculty mentors and in the seminar for the research project. Continuing both apprenticeship and seminar, this semester is devoted to analysis of the field materials and preparing a paper on the research. (SP)

280E. Issues Forum. (1) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Faculty and students meet together for discussion of current topics and pressing issues in sociocultural studies in education. Readings are assigned on an ongoing basis. This is an informal seminar that students are expected to attend throughout the duration of their enrollment in the Ph.D. program. (SP)

*280F. Dissertation Seminar. (3) Course may be repeated for credit. One 3-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Recommended for doctoral students preparing dissertation proposals and dissertations. Education / 175

On leave, spring
Recalled to active service
Recipient of Distinguished Teaching Award

On leave, fall

Social and Cultural Studies in Education

Upper Division Courses

180. Logic of Inquiry. (3) Three hours of lecture and discussion per week. An analysis of the logical and epistemological foundations of empirical research with the aim of developing a critical and rigorous approach to empirical inquiry, deductive and inductive logic, the structure of statistical argument, justifications, falsifications, the role of values, prediction and the nature of causality. (F) Packer

*Not offered 1991–92
On leave, spring, fall
On leave, fall
284C. Signs, Symbols, and Language. (3) Three hours of lecture per week. A study of the processes of education considered as the development of the ability to employ signs and symbols—linguistic and non-linguistic, metaphorical and literal—to serve expressive and communicative needs.

285A. The School as a Workplace. (3) Three hours of lecture/discussion per week. An introduction to the analysis of the social and psychological aspects of the teacher workplace and its effects on classroom teaching, teacher orientations to teaching, and career commitments. Topics include school-level effects on pupil progress, teachers and colleagues, structures of school-level leadership, and the workplace effects of district, state and union policies. (F) Little

285B. The Occupation of Teaching and the Education of Teachers. (3) Three hours of lecture/discussion per week. A critical examination of the issues surrounding the professionalization of the teaching occupation and the education of the teacher workforce. The evolution of professionalized occupations and the consequences of professionalization for individuals, institutions, and the society at large; the status and character of the teacher workforce; the formal enterprise of teacher education and the informal socialization of teachers; and various mechanisms of control over teachers and teaching.

286A. The Logic and Politics of Curriculum. (3) Three hours of lecture and discussion per week. Analysis of selected curricular issues in an attempt to develop an understanding of the "logic" (or epistemology) underlying decisions about what to teach and why, and of the "politics" (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 interest groups supporting them, and the responses of school professionals from the perspective of the school as a social system. (F) Jarrett

287A. Theories of the Self: Freud and Jung. (3) One 3-hour lecture/discussion per week. Prerequisites: Graduate status. Philosophical and psychological theories of the nature of human nature and their implications for education. The historical development of concepts of self. (SP) Packer

287B. Theories of the Self: Existentialism and Phenomenology. (3) One 3-hour lecture/discussion per week. Prerequisites: Graduate status. Philosophical and psychological theories of the nature of human nature and their implications for education and human development. The historical development of concepts of the self. (SP) Packer

288A. Theory and Traditions of Interpretive Research. (3) Three hours of lecture and discussion per week. An introduction to and overview of the logic and heuristics of interpretive research. The general character of interpretation will be examined, together with the associated notions of textuality, perspective, and voice. Different schools of interpretive analysis will be examined. (SP) Gerritz

288B. Theory and Methods in Interpretive Research. (3) Three hours of lecture and discussion per week. An introduction to the practice and conduct of interpretive research, including special ethical considerations of this kind of research, entry into the research setting, establishing an appropriate relationship with research participants, conducting interviews and analyzing interview transcripts, observing, and video-recording. Also to be examined are the evaluation of an interpretive analysis, and the form of the research report.

288C. Advanced Topics in Interpretive Research. (3) One 3-hour 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. (SP) Jarrett

294. 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. Recommended for students working on seminars, papers or theses, and doctoral students preparing dissertation proposals. (SP) Stack

298. Group Study for Graduate Students. (1-3) Course may be repeated for credit. One-three hours of lecture/seminar per week. Research on special problems and topics not covered by courses or seminars. (SP) Staff

Educational Administration

Graduate Courses

260A. Issues in Education Administration and Policy. (3) Three hours of lecture per week. (Required of all students in the Division of Educational Administration and Evaluation.) Concepts, theories, and issues related to administration and evaluation. Application is to governmental policy for school systems.

260B. Electronic Spreadsheets and Data Bases in Educational Administration. (3) One-hour lecture per week. This course is an introduction to the use of electronic spreadsheets and data bases on microcomputers. Examples used will focus upon applications in the field of education. In the methods used, students will use spreadsheets in business and the collection and organization of information. Students will use EXCEL (on the Macintosh) and Lotus 123 (on the IBM computer).

261A. Organization Theory in Education and Other Social Services. (3) Three hours of lecture per week. Concepts of power, authority, legitimacy, professionals, controls, incentives, etc., as they apply to education or other social services. (F) Benveniste

261B. Management of Change and Planning. (3) Three hours of lecture per week. This course will focus on techniques to facilitate change and planning in public service organizations. Topics to be included are organizational dimensions of change, control and risk taking, the planning process, concept of the multiplier, networking and coalition building, and planning as a management function. (SP) Benveniste

262A. School Leadership and Management. (3) Three hours of lecture per week. (Required of students in the administrative credential program.) An analysis of theories of leadership, motivation, small group dynamics, organizational climate, communication, etc., associated with site leadership and management. (F) Gerritz

262B. School Supervision: Theory and Practice. (3) Three hours of lecture per week. Concepts and practices associated with the analysis of teaching and clinical supervision of teachers. The role of the school leader in supervising teachers. (SP) Flanders

262C. Personnel Administration in School Systems and Social Organizations. (3) Three hours of lecture per week. Concepts and practices related to the administration of personnel services in education and other social organizations. (SP) Bronzan

262F. Teacher Development and Evaluation. (3) One 3-hour lecture per week. This course is required for students completing the Professional Administrative Services Credential, and is also open to advanced degree students interested in theory, research, policy and practice on this topic. Students will examine theoretical frameworks, prevailing state and local policy, and practical alternative strategies in the areas of teacher evaluation and teacher's professional development. Practical application will be emphasized in course assignments. (SP) Gritz

263A. Legal Issues in Educational Practice. (1-3) Two to five hours per week. For five weeks (1); 10-week class (2); 15-week class (3). Legal issues and practices in Education for teachers and counselors. (SP) Staff

263C. Concepts in Education Law. (3) One 3-hour lecture per week. In depth analysis of statutes, cases of historical importance which have had a major impact on educational policy and structure. Exploration of the relevance of law and education decision-making at the state and federal level. Primarily for those interested in an in-depth study of the law as it relates to educational issues.

264A. Intergovernmental Relations in Social Sector Organizations. (3) Three hours of lecture per week. Emphasis on the evolution and constitutional basis of local, state and federal governmental arrangements for social agencies. Attention given to policy development, planning, budgeting, procedures, implementation and evaluation. Reviews appropriate theoretical and empirical research findings regarding political processes of local, state and federal agencies and officials.

264B. 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 governance of education. Topics: local political consequences of federal categorical aid programs, effectiveness of intergovernmental relations strategies, formation of political reform networks in education.

265A. Economics of Education and Other Social Services. (3) Three hours of lecture and one hour per week. This course is designed to familiarize students with the methods of assessing the contributions of education to economic growth, demand for education services, education production functions, cost analysis and sectoral planning, economic aspects of innovation. (SP) Grubb

265B. Economic Development and Education in the Third World. (3) May be repeated for credit. Three hours of lecture per week. Prerequisites: Economics 100A-100B or Economics 101A-101B or equivalent. Human capital theory and its influence on economic planning in developing countries. The role of educational development in the distribution of income. The role of educated women in economic development. Proposals to improve external and internal efficiency of educational systems in developing countries. The role of basic education in third world development. (SP) Benson

266A. Finance of Education and Other Social Services. (3) Three hours of lecture per week. Fiscal policy and financing of social services. Systems of revenue generation. Tax schemes, models and formulas in various social sectors. Macroeconomic determinants of social sector finance. (SP) Benson

266C. Financial Management of Postsecondary Education. (3) Three hours of lecture per week. Alternative methods of developing unit costs, management information systems, and budget formulas for operations and capital facilities. Strategies for effecting program planning, budgeting systems. Sources of funding and financing research, public service instruction and buildings. (F) Kramer

267A. Curriculum and Instructional Foundations. (3) One hour of lecture and two hours of discussion per week. Educational psychology and its role in instructional design, planning, philosophical thought and human learning, use of taxonomies and models, variables affecting instructional effectiveness, and approaches to evaluation in curriculum and instructional activity. (F) Stone

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 take the teaching act and to conduct micro-teaching exercises.

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 course will examine the role of community colleges in society. Missions of community colleges will be related to the type of students served, curriculum, in-
struktion, governance, and mechanisms of control and support. (F) Cross

268B. Leadership in American Higher Education. (3) Three hours of lecture per week. Prerequisites: Consent of Instructor. An exploration, through reading, analysis, self-examination, reflection and writing, of issues related to American higher education, with special reference to community colleges. (SP) Fryer

268C. Seminar in Contemporary Higher Education: Developments, Issues, Changes. (3) Three hours of lecture per week. A seminar approach and review of current higher education, via a critical appraisal of recent developments, innovations, functional inter-relationships, and changing issues and problems. (SP) Cross

268D. Higher Education Organization. (3) Three hours of seminar per week. Organizational analysis of higher education. The system structure. Research universities, and other post secondary institutions. Bureaucratic and collegial controls. Higher education planning. Inter and intra politics of higher education. Topics vary to fit student interests. (SP) Benveniste

270A. Principles of Program Evaluation. (3) Three hours of lecture and one hour of discussion per week. An overview of the models, methods and research in educational evaluation. Includes basic concepts and procedures for evaluating programs, projects and curricula. Course format combines lecture/discussion and practical applications of evaluation principles to "real" educational programs or projects. (F) Stone

271D. Methods of Analysis for Educational Research and Decision-making. (3) Three 1-hour lecture/discussion per week. Covers qualitative research methods and analytical models for decision-making in education. (SP) Guthrie

271E. Classroom Research in Higher Education. (3) Three hours of lecture/discussion per week. This is a course for college administrators and faculty development specialists who work closely with faculty, as well as for college teachers. The goal of the course is to prepare teachers to assess the effectiveness of their teaching by systematically studying their students' learning. Second, the course will prepare administrators to initiate and promote the use of classroom research as a means of improving student learning and effectiveness of teaching. (F) Cross

271A. Evaluation in the Schools. (3) May be repeated for credit. Two hours of lecture and three hours of discussion/field work per week. Detailed treatment and discussion of topics and projects in evaluation selected from current interests of class and instructor connected with field work where possible.

272B. Evaluation in Higher Education. (3) Course may be repeated for credit. Three hours of seminar per week. Seminar provides an opportunity for students to conduct evaluative research investigations on innovative projects, programs, curricula, and courses.

273A. Qualitative Evaluation. (3) Course may be repeated for credit. Two hours of discussion 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, illumi-

native, historiographic, and connoisseurship, modes of inquiry. (SP) Stone

294. Thesis Seminar. (4) Course may be repeated for credit. Three hours of seminar and four hours of independent research per week. Must be taken on a satisfactory/unsatisfactory basis. Recommended for M.A. students working on seminar papers or theses, and doctoral students preparing dissertation proposals. Topic varies with instructor. (F,SP) Gerritz

Professional Courses

460A. Practicum in School Site Management I. (3) One 3-hour lecture plus field work per week. Prerequisites: Admission to Administrative Services Credential program. Supervised field experience, conferences, and colloquium. (F,SP) Gerritz

460B. Practicum in School Site Management II. (3) Three hours of seminar and three hours of field work per week. Prerequisites: Admission to Administrative Services Credential program. Supervised field experience, conferences, and colloquium. (F,SP) Gerritz

460C-460D. Research Practicum in Administration. (2,2) Two hours of lecture/discussion per week. Prerequisites: EDUC 294A-294B or equivalent and consent of instructor. This course engages Ed.D. students in collecting and analyzing data on efforts to improve educational practices or solve important problems in school systems. (F,SP) Stern

480F. Field Based Practicum: Internship in Educational Administration. (3) Six hours of field work per week, plus one 3-hour seminar will be scheduled during each semester. Prerequisites: Possession of Preliminary Administrative Services Credential. Supervised field based practicum and seminar for students working toward the Professional Administrative Services Credential. Administrative skills addressed in the course include evaluation of educational programs, administrative leadership skills, and written and verbal communication skills. (F,SP) Gerritz

480G. Field Based Practicum: Internship in Educational Administration II. (2) Six hours of field work per week, plus one 3-hour seminar will be scheduled during each semester. Prerequisites: Possession of Preliminary Administrative Services Credential. Supervised field based practicum and seminar for students working toward the Professional Administrative Services Credential. Administrative skills addressed in the course include strategic planning, program utilization and written and verbal communication skills. (F,SP) Gerritz

480H. Field Based Practicum: Internship in Educational Administration III. (2) Six hours of field work per week, plus one 3-hour seminar will be scheduled during each semester. Prerequisites: Possession of Preliminary Administrative Services Credential. Supervised field based practicum and seminar for students working toward the Professional Administrative Services Credential. Administrative skills addressed in the course include implementation of personnel policies, planning procedures: staff/plant facility, and written and verbal communication skills. (F,SP) Gerritz

480I. Field Based Practicum: Internship in Educational Administration IV. (2) Six hours of field work per week, plus one 3-hour seminar will be scheduled during each semester. Prerequisites: Possession of Preliminary Administrative Services Credential. Supervised field based practicum and seminar for students working toward the Professional Administrative Services Credential. Administrative skills addressed in the course include implementation of personnel policies, planning procedures: staff/plant facility, and written and verbal communication skills. (F,SP) Gerritz

Education in Language and Literacy

Lower Division Courses

90. Learning From Text. (1) Course may be repeated for credit. Two hours of discussion per week. Must be taken on a passed/not passed basis. This course assists undergraduates with reading and study skills. Students learn successful approaches for learning from their texts in such courses as Anthropology, Science, Sociology, Mathematics, and Humanities. (F,SP)

Upper Division Courses

140. Literacy: Individual and Societal Development. (3) Three hours of lecture and 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. (F)

141. Language Use in the Chicano Community. (3) Two 1/2 hour lectures per week. Introduction to the sociolinguistic study of bilingualism in general and of Chicano bilingualism in particular. Examination of the functions and uses of language within minority communities in the U.S. using the Chicano experience as a primary example. Considerable attention given to the educational implications of bilingualism in immigrant communities. (SP)

142. Writing and the Teaching of Writing. (3) Two hours of lecture/discussion per week. Prerequisites: Consent of instructor. This course is for courses considering a teaching career in the secondary or elementary schools. Written assignments will be based on the effective approaches that the Bay Area Writing Project has identified in its work with K-12 classroom teachers, K-13. Topics to be included: writing as a process, writing as learning, writing as art, writing about personal experience, writing about ideas. Best practices will be examined in relation to current writing theory.

143. Teaching English in Secondary School. (3) Two hours of lecture and three hours of field observation per week. Prerequisites: Upper division standing or consent of instructor. Exploration of issues confronting English and foreign language arts teachers today; curriculum trends and teaching practices; influence or reform efforts since the 1950's on English and language arts curriculum and practice; course assignments include field work, interviews, reading and reports. (F) Lane

Graduate Courses

241. Issues in Reading Instruction. (3) Three hours of lecture and discussion per week. Prerequisites: Consent of instructor. Course content will focus on the implications of reading theory and research for curricular decisions in 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. (F) Ruddell

242. Theoretical Issues in the Study of Literacy. (3) Three hours of seminar per week. Students will review trends in the history of writing instruction, and will then conduct current research about the experiences of written language acquisition and the writing process. Connections will be made between research, theory and practice. (F,SP) Freedman

243B. Approaches in Teaching English as a Second Language. (3) Three hours of lecture per week, plus a field work component. Prerequisites: Applied Linguistics course or a course in second language acquisition. 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 communicative 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, Valdes

243C. Teaching Linguistic and Cultural Minority Students. (2) Two hours of lecture and discussion per week. Prerequisites: Admission in a teaching credential program. The objective of this course is to prepare teachers to work with linguistic minority students. (SP)

On leave, spring

One offer 1991-92

*On leave, spring, fall

*Recalled to active service

*Recipient of Distinguished Teaching Award
We will consider ways in which different groups socialize children for learning and ways in which learning patterns acquired at home can conflict with the culture of school. Student teachers will consider instructional approaches for working with linguistically and culturally diverse students in their classrooms. (SP) Fillmore

243D. Issues in the Study of Bilingualism. (3) One 3-hour lecture/discussion per week. Prerequisites: Consent of the instructor. This course will consider 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, processes, and the nature of sociolinguistic bilingualism. Much time and attention will be devoted to questions and controversies surrounding bilingualism and education.

244A. Staff Development in Reading and Language Instruction. (3) Three hours of lecture per week. Prerequisites: Consent of the instructor. Emphasis is placed on design, artification, and implementation of reading-language curricula for primary grades through college community. Dynamics of personal leadership. Basic to successful curricula implementation is stressed. (SP) Dyer

244B. Issues in Language Arts Instruction. (3) One 3-hour seminar per week. Working within a development and sociolinguistic framework, students will examine the issues related to the assessment and fostering of oral and written language with emphasis on the elementary and middle school years. Among the topics to be covered are the role of talk in learning, the uses of the oral and written language, emergent literacy, and writing development. (SP) Dyer

244C. Issues in Staff Development. (3) Three hours of seminar per week. Students will examine current models of staff development and cooperative university-school programs to improve the teaching of English and the Language Arts against an overview of past practices. Students will be assisted in the planning and conducting of model workshops that demonstrate effective practices in language instruction. Connections will be made between current research and emerging staff development models. Field work in the schools, participating in Bay Area Writing Project.

244D. Issues in Secondary and Post-Secondary Reading Instruction. (3) One 3-hour lecture per week. Prerequisites: Consent of instructor. The focus of this course will be on the theoretical and instructional issues surrounding instruction in reading for secondary and post-secondary readers. Topics include: comprehension of literary text, comprehension of expository text, self-directed learning strategies, the role of writing in the learning process, and approaches to curriculum organization. (F) Dyer

244E. Issues in Secondary English Instruction. (3) Three 1-hour lectures per week. This course examines theoretical and applied issues 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; functions and uses of oral and written language; patterns of reading and writing development for adolescents; and evaluation of English language skills. (SP) Hull

245B. Language Study for Educators. (3) One 3-hour lecture/discussion per week. This course will introduce students to the broad area 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 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) Valdés

247. Research on Technology and Literacy. (3) Course may be repeated for credit. Three hours of lecture per week. This course focuses on the uses of computer and allied information technologies in literacy instruction. Students will use and critique instructional software, testing these programs against contemporary literacy theories and practice. Students will have the opportunity to develop new design software for literacy instruction and the language arts classroom, particularly programs that speak to the needs of students from multiple cultural backgrounds. (F) Hull

249. Foundations for Teaching Language Arts and Social Studies. Prerequisites: Consent of instructor. Prerequisites: Admission to a teaching credential program. Lectures and workshops on curriculum, instructional theory, and methods for teaching language arts and social science in elementary schools. (F) Dyson

251. Research in Reading. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: 242 or consent of the instructor. Critical examination of major readings and approaches to the study of reading. Emphasis will be on the effects of cultural and dialect differences on reading development. (SP) Freedman

252A. Psycholinguistics and Discourse Analysis. (3) Three hours of seminar per week. Examination of the role of language differences on 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, processes, and the nature of sociolinguistic bilingualism. Much time and attention will be devoted to questions and controversies surrounding bilingualism and education.

252B. Interpreting Research in Language and Literacy. (3) One 3-hour lecture per week. Directed practice in analysis and interpretation of published educational research on language in literacy. Familiarizes students with strengths and limitations of various approaches to investigation, and with a number of important studies in the field. (F) Dyer

254A. Research in Second Language Acquisition. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. The focus of this course will be on the role of language on the teaching of second languages. Emphasis will be placed on the effects of cultural and dialect differences on participation in classroom learning. This course will be examined in a socio-linguistic and ethnographic framework.

255. Literacy Problems and Language Differences. (3) Three hour lecture and discussion per week. 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 socio-linguistic and ethnographic framework.

256B. Qualitative Research in Language/Literacy Education. (3) One 3-hour lecture per week. Prerequisites: 245B or 244B or consent of instructor. This course focuses on the study of students' and teachers' use of language from a variety of interrelated perspectives, particularly developmental, sociolinguistic, and ethnographic. Students conduct small-scale studies in classroom settings in order to acquire an understanding of the goals and nature of qualitative, observation studies of language processes, including both oral and written language use. (SP) Lane

256A. Research on Early Literacy Development. (3) One 3-hour seminar per week. Prerequisites: 254A, 244B, or 242; or consent of instructor. This course is designed for 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. (F) Dynon

258A-258B. Foundations for Teaching Reading in Grades K-8. (2,2) One 2-hour lecture/workshop per week. Prerequisites: Admission to a teaching credential program. Introduction to reading and writing instruction in elementary school settings, basic literacy skills, instructional methods and approaches, assessment procedures, and reading and writing theories. Section 1 is intended for students in the Educational Research and Applications (ERA) teaching credential program and section 2 is intended for students in the Developmental Teacher Education Program (DTE). (F,SP) Ruth

259A-259B. Foundations for Teaching Reading in Secondary Schools. (2,2) One 2-hour lecture/workshop per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Admission to a teaching credential program. Introduction to reading and writing instruction in secondary school settings, basic literacy skills, instructional methods and approaches, assessment procedures and reading and writing theories. Section 1 is in the contexts of secondary English courses, and section 2 is in the contexts of science and mathematics courses. (F,SP) Ruth

294. Thesis Seminar. (1-6) May be repeated for credit. Up to three hours per semester. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Consent of instructor. Required for students working on seminar papers, qualifying papers, thesis, 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 studies. (F,SP) Freedman, Ruddeii, Simons, Valdés

298. Group Study for Graduate Students. (1-3) Course may be repeated for credit. One hour of lecture per semester per unit. Consent of the instructor. Reading and discussion of current and seminal research on special problems and topics not covered by courses or seminars. (F,SP) Lane, Fillmore

Professional Courses

340A-340B. Foundations for Secondary School English. (2,2) One 2-hour lecture per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Admission to English Credential Program of Bay Area Writing Project. Two workshops on teaching the secondary school English curriculum, with emphasis on the teaching of composition. (F,SP) Lane

342. Teaching Writing in Secondary School. (3) Course may be repeated for credit. Three hours of lecture and seminar/workshop per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Admission to English Credential Program of Bay Area Writing Project. Designed to instruct teachers in the description and demonstration of theoretical approaches and specific lessons for teaching and improved writing in secondary schools; includes frequent and extensive writing in and out of class and participation in writing response groups. Attendance during semester break is required. (SP) Lane

390A-390B. Supervised Teaching. (1-7) One hour of lecture and 24-28 hours of fieldwork per week. Credit
and grade to be awarded upon completion of the sequence. Prerequisites: Admission to a teaching credential program. 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. Credit and grade assigned upon completion of sequence. (F,SP) Lane

*390C. Supervised Teaching. (1-6) Course may be repeated for a maximum of 15 units. 2-20 hours of supervised teaching in public school classrooms and 1-3 hours of lecture per week. Prerequisites: Admission to a teaching credential program. Units and hours vary with individual credential programs and semesters.

440. Field Work for Advanced Reading-Language Leadership Program. (2) Course may be repeated for a maximum of 15 units. Two hours of seminar and two hours of field work per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Admission to Advanced Reading-Language Leadership Program. Application of theoretical knowledge through implementation and evaluation of reading-language programs in individual classrooms and school districts. (F,SP) Dyer

441. Program Assessment in the Language Arts. (3) Course may be repeated for credit. One 2-hour lecture and 6-10 hours of fieldwork per week. Prerequisites: Admission to the Language Arts Leadership Program. An introduction to the issues and problems associated with assessment in the Language Arts. Readings and class discussions will address the complexity inherent in learning, and measurement and evaluation associated with program assessment. Concepts derived from the discussions will then be applied to specific issues in Language Arts assessment. (SP) Staff

Education in Mathematics, Science, and Technology

Lower Division Courses

1. Introduction to Cognitive Science. (3) One 2-hour lecture and one 3-hour laboratory per week. This course is designed to introduce the interdisciplinary field of cognitive science. Lectures and readings will survey research from artificial intelligence, psychology, linguistics, philosophy, neuroscience, and will cover topics such as the nature of knowledge, thinking, remembering, vision, imagery, language, and-consciousness. Sections will demonstrate some of the major methodologies. Also listed as Cognitive Science 1 and IDS 2. (SP) Pitilli, Ranney

Upper Division Courses

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 the interdisciplinary field of cognitive learning. The course is designed to develop skills in persons working in museums and youth organizations as well as to introduce teaching persons considering it as a professional career. Selected topics in Science, Mathematics, and Computing provide the central but not exclusive context for instruction. (SP) Miller

123. Word Processing for Scientific Writing. (1) Self-paced with tutors including periodic group meeting. This course teaches the use of basic word processing. Prerequisites: Consent of instructor. Conceptual overview of scientific paper writing using the word processor with emphasis on educational implications of the technology. Issues associated with the use of word processing include feedback, shared annotated bibliographies, write, edit, and format papers in accordance with professional journal guidelines. Use of the Apple Macintosh and IBM PC will also be introduced. (SP) Woodson

Graduate Courses

220. Artificial Intelligence for Cognitive Scientists. (3) Two hours of lecture and three hours of laboratory per week. The goal in this course is to provide students in cognitive science with programming skills in artificial intelligence (AI) 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 an intelligent tutoring system to teach essential LISP programming and later provide instruction in basic AI programming techniques. (F) Pitilli

*221B. Curriculum Development and Instruction in Science. (3) Three hours of lecture and one hour of discussion per week. This course provides a historical review of science curriculum development and application of cognitive science to classroom instruction in the United States, including analysis of effect upon them by social 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.

*222A. Programming and Problem Solving. (3) One 3-hour lecture per week. This course will analyze how experts and novices solve programming problems; examine recent investigations of programming problem solving and relate these investigations to recent research on learning and instruction. Using these insights, current programming instruction will be examined. Other topics include: programming environments such as MacPascal instruction, programming text books, and student behavior when solving programming problems.

*222B. Design of Computer-Based Instruction. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. The study of methods related to the design of effective computer-based instruction; development of students' abilities to critically review educational software; and application of design principles in writing computer-based instructional materials.

*223A. Advanced Topics in Mathematics, Science, and Technology Education. (3) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: 220A or 222A or consent of instructor. Problem solving, ethnography, etc. Subject matter changes from offering to offering.

223B. Special Problems in Mathematics, Science and Technology Education. (2-4) 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. Study of special problems and issues in computer-related, educational areas. Section topics are denoted below: 1) Computational environments; 2) Science education and technology; 3) Models of cognition, knowledge and learning; and 4) Mathematical cognition and technology. (F,SP) Staff

*224A. Mathematical Thinking and Problem Solving. (3) One 3-hour lecture per week. This course explores contemporary research on mathematical cognition, with a particular emphasis on "higher order thinking" and problem solving. We discuss various frameworks for characterizing mathematical behavior and various methodologies for examining it. As an "action oriented" course in the EMST curricular sequence, this course constitutes a major course project. In their projects, students engage in research incorporating the main ideas studied in the course.

*224B. How People Learn Computer Science. (4) Two 2-hour lectures per week. In this course an attempt will be made to relate fundamental aspects of learning computer science topics using a variety of experimental methods. Theories and experiments will initially be designed by the instructor; by mid-semester, students will be charged with the task of identifying hypotheses of interest, and design one or more experiments to address these theories; by the end of the semester, students will be expected to have conducted their own small study.

*225A. Introduction to Intelligent Computer Assisted Instruction. (1) One 2 hour lecture per week. An introduction to research on computer-based learning environments augmented with an intelligent program that acts as a tutor, coach, or consultant.

*225B. Programming Intelligent Computer Assisted Instruction. (4) One 2 hour lecture and six hours of lab per week. The aim of this course is to confer upon students the facility to create intelligent computer assisted instruction (ICAI) systems. A programming intensive course that will require significant LISP experience.

*225C. Cognitive Approaches to Computer System Design. (2) One 2-hour lecture per week. This course, based largely on reading and critical analysis, will survey and analyze some of the mental processes involved in understanding and operating computer systems (i.e. text editing, operation of calculators and user interface to computer systems), activity structures involving multiple operation tools and programming) as well as cognitive constructs being developed to under- stand performance. Requirements include three analytical papers.

225D. Computer System Design Project Laboratory. (1) One 1-hour lecture per week. Prerequisites: Consent of instructor. The system design project laboratory is an integral laboratory course to a teaching credential program. Units and hours vary with individual project. Laboratory may be taken simultaneously or sequentially with 225C. In cases of extraordinary preparation, the laboratory course may be taken independenty.

226. Constructive Epistemology. (3) Three hours of lecture per week. Major approaches to epistemology (epistemological, effective control and self-regulation in problem solving; belief systems and naive epistemologies) will be surveyed from the following points of view: metacognition's theoretical and practical importance, evidences that humans have such knowledge, where such knowledge is attained, the extent to which it is learnable and significant about how it might be developed.

228A. Qualitative Methodology. (3) Three lectures and/or a discussion per week. This course will be organized by principal activities: group readings, book reports, expert and novice methodology presentations, in-class research and analysis, and student research. For each activity, we will examine a different methodological approach to "how to" methods and specific areas of concern to general questions including: what constitutes objective data, what are strengths and weaknesses of methods in regard to various issues, and what are the relationships between theory and data? (SP) Brenner, Ranney

228B. Modelling of Knowledge and Cognitive Processes. (4) Two 2-hour lectures per week. Prerequisites: Planned or in progress research project. This course teaches basic concepts and techniques of the major methods for constructing and using cognitive models. Students will learn methodology in the context of a project. A prerequisite of enrolling is that the student either already conducting or has planned and will be conducting a research project in which they are developing a model of knowledge structures or cognitive processes. Construction of a cognitive model related to the research project will be a major activity of the course.

229A. Problem Solving and Understanding. (3) Three hours of lecture/discussion per week. Students will examine problem solving in children and adults, from a predominately cognitive science perspective, begin with an examination of thinking involved in diverse problem types. Students will then analyze the literature concerning cognitive issues that transcend problem types, including representation, "understanding", access and availability of knowledge, ac-

On leave, spring
Recalled to active service
Recipient of Distinguished Teaching Award
cess to one's own cognitive processing, categorization, the architecture of knowledge, and the control of cognition. (F) Ranney

*229B. Cognitive Science Approaches to Learning. (2) One 2-hour lab per week. Theories and models of learning in cognitive psychology and artificial intelligence. Through extensive reading, students will become familiar with recent artifical intelligence approaches to matching learning, formal theories of learning and development, and psychological work on learning in semantically rich domains. Topics covered will include concept learning, learning in connectionist networks, skill acquisition, analogy and language acquisition.

*229C. Development of Mathematical and Scientific Cognition. (3) Three hours lecture per week. Students will examine children's mathematical and scientific cognition from a developmental perspective. Considered are questions fundamental to inquiry into cognitive development, including what it means to take a developmental perspective and how we can represent states and changes in children's knowledge. Research concerning the development of scientific and mathematical cognition from infancy to adolescence will be critically analyzed. Students will design/implement an empirical project.

*229D. Developing Children's Mathematical Cognition. (3) Three hours lecture/discussion per week. This seminar analyzes research on the development of mathematics cognition in children and adolescents. Research on the psychology of learning and current instructional practice. Topics include basic calculation, word problems, algebra and proportional reasoning. Through critical analysis of the readings and directed research projects, this course will attempt to reconcile the current disjunctions between cognitive research and educational practice.

230A-230B, Instruction in Elementary Schools. (5/5) Five hours of lecture/seminar plus two hours of workshop in the fall. Credit and grade to be awarded upon completion of the sequence. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Admission to a credential program. Formerly ED-SCSE 280A. Seminars, lectures and workshops to meet the requirements for the multiple subject credential. (F,SP) Dwell, Hartwary, Lowney, Miller, Schaefer

231A-231B. Instruction in Secondary Schools. (5/5) Credit and grade to be awarded upon completion of the sequence. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Admission to a credential program. Seminars, lectures, workshops to meet requirements for the single subject credential. Subject areas include educational psychology, instructional strategies, learning processes, and secondary school mathematics, science and technology. (F,SP) Lowery, Madgisan, Stack, Stahr

*233. Research and Advanced Instruction—Elementary and Secondary Schools. (3) Three hours of lecture and one hour of laboratory per week. Explorations in research and advanced methods of strategies of teaching.

235. Elementary Teaching in Mathematics and Science. (3) One 3-hour lecture per week. Prerequisites: Admission to a credential program. Curriculum, instructional theory, and methods for teaching mathematics and science in elementary schools. (F) Gigante, Lipner, Lowery

*231A. Exploring Mathematics with Computers: Turtle Geometry. (3) One 2-hour lecture and one 3-hour laboratory per week. Provides in-depth mathematical subject matter explorations through computer lab work and discussions. 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, graph theory, geometry of planar paths, geometry on curved surfaces and Einstein's General Theory of Relativity. Some elementary programming recommended.

291B. Cognitive Consequences of Computers in Classrooms. (3) One 2-hour seminar and three hours of computer lab each week. Prerequisites: Consent of instructor. To explore the cognitive consequences of computers in instruction and learning, the promise of computers in education will be examined and exemplary instructional software will be explored. A model of knowledge acquisition and knowledge change incorporating computer-delivered instruction will be developed. (SP) Linn

294. Seminar on Formulation of Educational Research. (1-4) Course may be repeated once for credit. One or two hours of seminar per week. Advanced study of research topics of interest to the participants. (F,SP) Miller

*296. Internship in Math, Science and Technology Education. (1-4) Course may be repeated for credit. One 2-hour seminar every other week plus three to ten hours of laboratory per week. Internship on an educational research and 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.

298. Group Studies, Seminars, or Group Research. (1-4) Course may be repeated for credit. One to four hours of seminar per week. Advanced study in education. Topics vary from semester to semester. May consist of organized lectures or seminar discussions, related chiefly to the research area in which the group is working. (F,SP)

Professional Courses

390A-390B. Supervised Teaching. (7-7) One to three hours of lecture/seminar per week. Advanced group study in education. Topics vary from semester to semester. May consist of organized lectures or seminar discussions, related chiefly to the research area in which the group is working. Written assignments and final examination required.

Upper Division Courses

*100. Educational Psychology for Teachers. (2) One 2-hour lecture and one hour of discussion per week. Prerequisites: Admission to teaching credential program. Lectures on topics of special interest to teachers, including child and adolescent development, the teaching profession, and classroom evaluation. Application of these concepts to the school setting and consultation on actual classroom problems. (SP) Staff

*101. Learning and Memory Development in Education. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: Psych 1 and 5, or consent of instructor. Alternative theoretical perspectives and research on the character and sources of learning and memory development, including the uses that have been or might be made of these perspectives in analyzing and revising instructional programs in schools and colleges, and the uses that students might make of these perspectives to enhance their own intellectual development and academic achievement. Rovner

114A. Early Development and Education. (4) Three 1-hour lectures and two hours of field observation per week. Theory and research on psychological development from birth through early childhood. Special attention to relations between developmental theory and educational practice. Directed field observation of developmental phenomena and educational practices. (F) Starkey

114B. Seminar in Early Development and Education. (2) Two 2-hour seminar per week. Prerequisites: Consent of instructor. One 2-hour seminar per week. Advanced study of special topics in early childhood education and child care. Discussion of infant-toddler, preschool, and early elementary education programs. Early intervention programs (e.g., Project Head Start) and early childhood education programs (e.g., Montessori and play-based programs) will receive special attention. (SP) Starkey

114C. Practicum in Early Development and Education. (3) Course may be repeated once for credit. Nine hours of field work per week. Prerequisites: 114A or consent of instructor. Students will work under the supervision of an early childhood teacher in a local school program, gaining experience in the design and implementation of an educational program. Students will assist a teacher in the design and use of instructional materials and will obtain practical experience by presenting such materials to small groups of children in the classroom. Must be taken concurrently with EDPSYCH 114B. (SP) Starkey

Graduate Courses

*200A. Cognitive Development. (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. Development of cognition from birth to maturity. Psychological and information processing theories and research. Vygotsky's theory. Primary emphasis on normal human development; secondary emphasis on a typi
cal and animal cognition. Infant perception and cogni

*200B. Social Development. (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. An exa
mination of theory and research on social development from childhood to early adulthood. Review of dif
f erent theoretical orientations to social cognition, morality, psychosexual development, and the role of social-environmental factors.

*200C. Learning and Memory Development. (3) Two 1½-hour lectures/discussions per week. Prereq
uileges: Consent of instructor. A consideration of maj
or theories and research on the development of hu
man learning and memory from early childhood through young adulthood.

200D. Theories of Intelligence. (3) Two 1½-hour lec
tures per week. Prerequisites: One course in statistics. A consideration of psychometric approaches to the study of individual differences in human mental abili
ties, with emphasis on intelligence, including theories and empirical research on the measurement, nature, and structure of abilities, from Galton to the present. (SP) Staff

*200E. Neuropsychology of Reading. (3) One 3-
hour session per week. Prerequisites: Consent of in
structor. Review and discussion of current research in neuropsychology related to infor
mation processing and reading. Includes discussion of processes in normally functioning individuals and in
formation processing problems in children and adults. Topics may be specialized at a given offering of the course; e.g., eye movements, aphasia, etc.

201A. Psychology of Reading. (3) One 3-hour lec
tures per week. Comparison and analysis of the psychol
ogical and linguistic evidence underlying whole lan
guage and skills methods of reading instruction. Topics include reading readiness, emergent literacy, the Eng
lish spelling system and decoding, vocabulary develop
ment, models of reading, individual differences in acquisition and comprehension and schema theory. (SP) Simons

201B. Seminars in Intellectual Development. (2) Course may be repeated for credit. One 2-hour semi
nar per week. Prerequisites: Relevant courses from the 200 sequence and consent of instructor. 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 (F) Ammon, Starkey

201C. Seminar on Reading Disability. (3-5) One 3-hour seminar per week. (Additional 8 hours of field work per week for 2 units of credit.) 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 field work involves diagnosing and treating children with reading problems and preparing written case studies.

202D. Seminars in Social and Personality Development. (2) Course may be repeated for credit. One 2-hour session 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 title in the following sections:

(1) Social Development
(2) Motivation
(3) Personality Development (F,SP) Tuvel

203A. Individual Differences: Behavioral Genetic Analysis of Human Abilities. (3) Two 1½-hour lectures per week. Prerequisites: Two courses in statistics, including correlation and analysis of variance. A consideration of the application of quantitative genetics methods to the study of human variability in educationally relevant traits, with emphasis on cognitive abilities. The course examines the methodology of twin studies, adoption studies, mating systems, heritability estimation, and analysis of the interaction roles of genetic and environmental factors in development. (SP) Jennifer Johnson

204A. Logic of Theoretical Inquiry. (2) One 2-hour seminar per week. Prerequisites: Consent of instructor. A review and discussion of theoretical positions concerning methodological issues, problems of scientific inference, measurement, and interpretation. A reasonable knowledge of statistics is helpful, although the course is not concerned with statistical calculations as such.

204B. Critical Analysis of Empirical Inquiry. (2) Two 1½-hour sessions per week. Prerequisites: 209A-209B and consent of instructor. Critical review and detailed analysis of scientific research. Emphasis is not on content but on method, logic, and appropriateness of inference as represented in the research examined.

204C. Research Seminars: Inquiry in Educational Psychology. (3) Course may be repeated for credit. One 3-hour seminar per week. Prerequisites: Consent of instructor. The doctoral program in Educational Psychology requires that students complete extensive projects of documentary and empirical research. As they engage in these projects, students will enroll (ordinarily during their second year in residence) in appropriate sections of this seminar. At each meeting, participants will present their own projects, and analyze those presented by others.

205. Instruction and Development. (3) One 3-hour 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, vocabulary, science, computer literacy, motivation, self-regulated learning, and classroom organization. (F) Staff

207A. Standard Tests in Education. (2) One 2-hour lecture per week, plus two hours of field work biweekly. Introduction to measurement concepts and procedures, the development and utilization of educational and psychological tests in school settings. In particular examines achievement, cognitive abilities, adaptive behavior and other tests commonly confronted by teachers and pupil personnel workers. (F) Staff

207B. Individual Appraisal of Intelligence. (4) One 3-hour lecture and 8 hours of field work per week. Prerequisites: Consent of instructor. Theories of intelligence and related topics will be discussed. Measurement concepts applied to intelligence tests, development, administration and interpretation of the WISC-R, Stanford-Binet, and other instruments pertaining to intelligence testing. Current controversial issues in testing, including issues pertaining to test bias and legal aspects of testing. (F) Staff

207C. Diagnosis of Human Handicaps. (4) One 3-hour lecture and 6 hours of field work per week. Prerequisites: Consent of instructor. Reviews current criteria for the handicapped and evaluates available procedures for making diagnostic decisions. Special topics may include diagnosis of learning disabilities, mental retardation, neurological handicaps, emotional and behavioral disorders. (SP) Staff

207D. Assessment and Education of Exceptional Pupils in Regular Classes. (2) One 1-hour lecture and one hour of discussion per week. Methods for assessment of handicapped children and their implication for their education. Special topics as nondiscriminating testing, least restrictive environments, alternative programs, parent communication, interpersonal relationships, characteristics, behavior of individual exceptional children, and remediation. Optional field work involves diagnosis and treating children with reading problems and preparing written case studies. (SP) Staff

208A. Educational Measurement I. (4) Two 2-hour lectures per week. An introduction to classical test theory and item response theory from a theoretical viewpoint. Application of these techniques to a practical measurement situation will be studied. Topics such as test bias, computerized and polytomous response modes will be discussed. (F) Wilson

208C. Psychological Scaling. (4) Three 1½-hour lectures per week. An introduction to the measurement process. Prerequisites: 208A. A sufficient background to follow the mathematical development. An introduction to classical test theory and item response theory from a theoretical viewpoint. Application of these techniques to a practical measurement situation will be studied. Topics such as test bias, computerized and polytomous response modes will be discussed. (F) Wilson

208D. Educational Measurement II. (4) Two 2-hour lectures per week. Prerequisites: 208A. An introduction to classical test theory and item response theory from a theoretical viewpoint. Application of these techniques to a practical measurement situation will be studied. Topics such as test bias, computerized and polytomous response modes will be discussed. (F) Wilson

209A. Multivariate Procedures. (4) Two 2-hour lectures per week. Prerequisites: Educ 293A or 209A, and 209B. Simple, multiple and canonical correlation and regression, discriminant analysis, multivariate analysis of variance; principle components; contingency tables; planned and post hoc comparisons. (SP) Staff

209B. Multivariate Procedures. (4) Two 2-hour lectures per week. Prerequisites: Educ 293A or 209A, and 209B. Simple, multiple and canonical correlation and regression, discriminant analysis, multivariate analysis of variance; principle components; contingency tables; planned and post hoc comparisons. (SP) Staff

209L. Educational Data Analysis Laboratory. (1) Laboratory per week. Prerequisites: Prerequisite for 209A. Reviews current criteria for the handicapped and evaluates available procedures for making diagnostic decisions. Special topics may include diagnosis of learning disabilities, mental retardation, neurological handicaps, emotional and behavioral disorders. (SP) Staff

210F. Proseminar in Educational Data Analysis. (1) Lecture may be repeated for credit. One hour of supervision per week. Prerequisites: Consent of instructor. An introduction to theories of human development and their application to elementary and preschool education. Topics include cognitive development, moral and social development, language, and socio-emotional development. (F) Staff

210L. Advanced Data Analysis Laboratory. (1) Course may be repeated for credit. Two hours of laboratory per week. Prerequisites: Consent of instructor. One hour of supervision per week. Prerequisites: Consent of instructor. An introduction to theories of human development and their application to elementary and preschool education. Topics include cognitive development, moral and social development, language, and socio-emotional development. (F) Staff

211A-211B. Human Development and Education. (3,3) One 3-hour lecture/discussion per week. Prerequisites: Consent of instructor. One hour of supervision per week. Prerequisites: Consent of instructor. One hour of supervision per week. (F,SP) Ammon, Black, Lowery, Simons

211L. Laboratory for Human Development and Education. (1) One hour of supervision per week. Prerequisites: Consent of instructor. One hour of supervision per week. Prerequisites: Consent of instructor. One hour of supervision per week. (F,SP) Ammon, Black, Lowery, Simons

212A. Advanced Topics on Exceptional Children. (3) One 3-hour lecture and one hour of field work per week. Prerequisites: Consent of instructor. Topics will include problems in mainstreaming mildly handicapped children and social psychological perspectives on the education of exceptional children.

213A. Conceptual Bases for School Psychology. (3) One 3-hour lecture and six hours of field work per week. Historical and contemporary overview of the professional specialty of school psychology. (F) Staff

213B. Theoretical and Scientific Bases for School Psychology Practice. (3) One 3-hour lecture per week. Examines the empirical evidence for developmental and learning models in relation to the school curriculum and school organization from elementary through high school. (SP) Staff

213C. School-Based Consultation. (3) One 3-hour lecture per week. Theories of consultation, consultation methods, and research on consultation applicable to primary and secondary prevention of school failure and school psychology practice. (F) Lambert

213D. Educational Interventions for the School Psychologist. (3) One 3-hour lecture per week. Theories and procedures for individual and group assessment of children's learning and behavior problems as applied to the design of individual and group programs in the classroom. Staff
213L Laboratory for School Psychology. (1) One hour of discussion and six hours of field work per week. Lab members will evaluate field work records and for supervision of school assignment. Must be taken concurrently with 213A-213B-213C-213D. (F.S.P. Duncan, Goodman, Hartough)

294. Thesis Seminar. (1-4) May be repeated for credit. Three hours of discussion per unit per week. Must be taken on a satisfactory/un satisfactory basis. Prerequisites: Consent of instructor. Recommended for degree students working on seminar papers, theses or dissertation proposals. Topical coverage includes the adoption of a thesis topic, research design, and statistical analysis. (F.S.P. Lambert)

298. Group Study and Research. (1-6) Course may be repeated. One to six hours of seminar per week. Must be taken on a satisfactory/un satisfactory basis. Group study and research on special problems and topics. (F.S.P. Wilson)

Professional Courses

390C. Supervised Teaching. (1-8) Course may be repeated for a maximum of 15 units. 2/0 hours of supervised teaching in public school classrooms and 1-3 hours of lecture per week. Prerequisites: Admission to a teaching credential program. Units and hours vary with individual credential programs and semesters. (F.S.P. Black, Peretti)

411L. Inservice Practicum & Consultation in Development and Teacher Education. (1) Course may be repeated. Four hours of discussion/lab per week. Prerequisites: Admission to Teaching Practicum methods and consultation sections plus 23 hours of field work and consultation per semester. Prerequisites: Admission to DTE Inservice Program. Bi-weekly, one hour lecture/discussion section combined with regular on-site consultations by campus-based supervisors focused on adapting the material presented in the core program seminars (EP 211A-B-C-D) to teaching practice.

413A-413B. Community-Based Internship in School Psychology. (3,3) Two hours lecture/discussion and six hours field work per week. Must be taken on a satisfactory/un satisfactory basis. Supervised assignment to a community mental health agency in capacity of school psychologist. (F.S.P. Goodman)

413C-413D. School-Based Internship in School Psychology. (6,6) Two hours lecture and three days of field work per week. Must be taken on a satisfactory/un satisfactory basis. Supervised assignment to a school district. (F.S.P. Singh)

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/un satisfactory basis. Supervised assignment to a school district. (F.S.P. Goodman)

Interdepartmental Studies Courses

Upper Division Courses

IDS 110. Introduction to Computers. (3) Students who have completed the prerequisite courses in Computer Science 7, 8, or the 50 series will receive no credit for IDS 110. Three hours of lecture per week. Prerequisites: Upper division standing. Students must also be enrolled in IDS 110L (with the same grading option as in IDS 110) or an equivalent departmental course. Primarily for students in the social sciences and humanities and in the professional schools other than Engineering. The conceptual foundations of computing and information technology. Structure and function of operating systems. Elements of programming. Applications programs. Examples are drawn mainly from word processing, database management, electronic spreadsheet, graphics and simulation, graphics and animation, computer assisted design, computer networks, operating systems, and field work of student groups. Sponsoring departments: Engineering, Computer Science, and Education.

IDS 110L. Introductory Computer Laboratory. (1) Two 2-hour laboratories per week. Prerequisites: Upper division standing. Students must also be enrolled for IDS 110 (with the same grading option as in 110L). Primarily for students in the social sciences and humanities and in the professional schools other than Engineering. The conceptual foundations of computing and information technology. Elements of programming. Applications programs. Programs are drawn mainly from word processing, database management, electronic spreadsheet, graphics and simulation, graphics and animation, computer assisted design, computer networks, operating systems, and field work of student groups. Sponsoring departments: Engineering, Computer Science, and Education.

IDS 121A-121B. Environmental Education. (3,3) Five and one-half hours of lecture/discussion and six hours of field work per week. Must be taken on a satisfactory/un satisfactory basis. Prerequisites: Admission to Environmental Education. Course may be repeated for credit. One to six hours of seminar per week. Must be taken on a satisfactory/un satisfactory basis. Group study and research on special problems and topics. (F.S.P. Hurst)

IDS 130. Seminar on Social, Political and Ethical Issues in Health and Medicine. (2) One 1-hour lecture and one 1-hour discussion per week. Must be taken on a pass/no pass basis. An interdisciplinary approach to health and medicine. Guest lecturers will speak on the social, political and ethical aspects of health and medicine. Topics will be chosen to reflect the present and future trends in health care systems. Prerequisites: Consent of instructor. (F.S.P. Goodman)

IDS 191. Public Health and Nuclear War. (2) One hour lecture and one hour discussion per week. The course will examine the impact of public health on the current arms race and the threat of nuclear war. Topics to be considered include the history, discussion, and analysis of health and medical effects of nuclear war, as well as the economic, psychological, and health dimensions of destruction from the use of nuclear weapons. Prerequisites: Consent of instructor. (F.S.P. Singh)

IDS 217. Technology, Tasks, and Politics. (3)
IDS 218. Information Resource Management. (3)
IDS 219. Financing Tools for Public Managers. (3)
IDS 220. Management Professionals in Organizations. (3)

For information about these and other courses related to this program, see the Public and Nonprofit Management section of this catalog.

Electrical Engineering and Computer Sciences (College of Engineering)

Department Office: 231 Cory Hall, 642-3214
Chair: Paul R. Gray, Ph.D.

University Professor:

J. C. W. Chui, Ph.D. (Emeritus) University of California at Berkeley. Communications applications of lasers

Professors:


Charles K. Birdsal, Ph.D. Stanford University. Plasmas Research Center. Plasmas and toroidal devices

David A. Hughes, Ph.D. (The Roy W. Carlson Professor of Engineering) University of California at Berkeley. Integrated circuits

Ching-Hsin Hu, Ph.D. Pennsylvania State University. Solid state physics

Edward R. Keller, Ph.D. Johns Hopkins University. Neurophysiology of ocular motor systems

Paul G. Meier, Ph.D. University of California at Berkeley. Solid state sensors, microelectronics

Andrew R. Neureuther, Ph.D. University of Arizona. Integrated circuits and devices

Kenneth K. Mei, Ph.D. University of Wisconsin, Madison. Electromagnetic theory

John M. McCreesh, Ph.D. (Chair) University of Michigan. Digital transmission systems

Robert G. Meyer, Ph.D. University of Melbourne. IC design and technology

Richard S. Muller, Ph.D. California Institute of Technology. Opto-electronics

Kam Y. Lau, Ph.D. California Institute of Technology. Optical electronics

William J. Welch, Ph.D. University of California at Berkeley. Computer-aided design, computer architecture

Winfried Stecher, Ph.D. Carnegie Institute of Technology. Electro-optics

R. V. H. Smith, Ph.D. Carnegie Institute of Technology. Solid state physics

A. H. W. van der Ziel, Ph.D. California Institute of Technology. Solid state physics

Graduate Course

IDS 271. Seminar in Neuropsychology. (3) Course may be repeated for credit. One 3-hour lecture and one 2-hour laboratory per week. Lectures and case presentations of patients alternate with discussions of problems in the field of neuropsychology. Prerequisites: Consent of instructor.

IDS 272. Seminar on Social, Political and Ethical Issues in Health and Medicine. (2) One 1-hour lecture and one 1-hour discussion per week. Must be taken on a satisfactory/un satisfactory basis. An interdisciplinary approach to health and medicine. Guest lecturers will speak on the social, political and ethical aspects of health and medicine. Topics will be chosen to reflect the present and future trends in health care systems. Prerequisites: Consent of instructor.

IDS 283. Organizational Decline and Backward Management. (4) See listing under Mass Communications for complete course description.

Public Policy 283. Organizational Decline and Backward Management. (4) See listing under Public Policy for complete course description.

Program in Public and Nonprofit Management

IDS 206. Advanced Seminar in Public and Nonprofit Management. (3)

IDS 207. Managers and Management. (3)

IDS 208. Techniques of Management Control. (3)

IDS 209. Applied Microeconomics. (3)

IDS 210. Organizational Understanding for Managers. (3)

IDS 211. Public Sector Accounting. (3)

IDS 212. Financial Management. (3)

IDS 214. Strategic Management in the Public Sector. (3)

IDS 217. Technology, Tasks, and Politics. (3)

IDS 218. Information Resource Management. (3)

IDS 219. Financing Tools for Public Managers. (3)

IDS 220. Management Professionals in Organizations. (3)

For information about these and other courses related to this program, see the Public and Nonprofit Management section of this catalog.
Richard M. White, Ph.D. Harvard University.
Semiconductors and ultrasonics
Eugene Wong, Ph.D. Princeton University. Database systems
Fred Smith, Ph.D. University of California at Berkeley. Power systems
Diogenes J. Angelakos, Ph.D. (Emeritus)
Otto J. M. Smith, Ph.D. (Emeritus)
Associate Professors:
Roger T. Howe, Ph.D. University of California at Berkeley. Integrated sensors, chemical engineering
Edward J. Lee, Ph.D. University of California at Berkeley. Signal processing, digital communications
Stephen F. Derenzo, Ph.D. (in Residence)
Assistant Professors:
Richard M. White, Ph.D. Harvard University. Symbolic and algebraic manipulation.
Roger T. Howe, Ph.D. University of California at Berkeley. Computer architecture.
Jitendra Malik, Ph.D. Stanford University. Artificial intelligence.
Raimund Seidel, Ph.D. Cornell University. Computational geometry.
Katherine Yelick, Ph.D. (Acting) Massachusetts Institute of Technology. Parallel processing, algorithm design, and applications.
Adjunct Professor:
Lenore C. Blum, Ph.D.
Affiliated Professor:
Barbara Y. White, Ph.D.
Senior Lecturer:
Michael J. Clancy, M.S.
With rapid growth in technology, electrical engineering now encompasses solid-state devices, integrated circuits, microwave electronics, quantum and optical electronics, bioelectronics, radiation and propagation, plasmas, power systems, control systems, communications and information theory, circuit theory, ge- scale networks and systems, ecological systems and pattern recognition.

Programs in computer science are offered by the department through its Computer Science Division. Undergraduates who wish to major in computer science may do so either through the College of Engineering or the College of Letters and Science.

Computer science programs include such topics as analysis of algorithms, artificial intelligence, complexity, theory of computation, computer architecture and machine organization, computer graphics, data base management systems, formal languages and automata theory, numerical analysis, parallel and pipeline computers, performance analysis, programming languages and computers, operating systems, and symbolic-algebraic manipulation.

Beyond satisfaction of the minimum requirements for the B.S. degree in EECS, students follow one of three basic paths in completing their major program. They may select the General Electrical Engineering and Computer Sciences Program in which they will receive an introduction to a large number of the areas outlined above. Alternatively, they may emphasize particular subject areas by choosing one of the four main programs in the Department of Electrical Engineering and Computer Sciences: electronics, systems, computer sciences, and bioelectronics. Or they may plan an individual program to suit their special needs or backgrounds.

Students should take part of the elective units in engineering, physical 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 comprises the completion of coursework in electrics, electronics, systems analysis, electromagnetic fields, communication and control theory, computer systems and programming, dynamics, thermodynamics, and modern physics. Details about the curriculum can be found in the Undergraduate Information Handbook.

1. The Electronics program is for students interested in (Program A1) the area of integrated circuits, including fabrication technology, solid state devices, circuit analysis and design, VLSI design, and computer-aided design and manufacturing and (Program A2) the areas of microwaves, acoustics, optoelectronics, plasmas, cryoelectronics, planar microwave circuits, antennas, and propagation.

2. Circuits and Systems (Program B) is for students with interests in networks, control, robotics, digital and analog communications, computer networks, signal processing, systems design and optimization, and power systems planning and operations.

3. Computer Sciences (Program C) is for students interested in all aspects of computer science and engineering, including machine architecture and logical design, operating systems, programming languages, digital devices and circuits, artificial intelligence, design and analysis of algorithms, complexity theory, computer graphics, database systems.

4. Bioelectronics (Program D) is for students with an interest in biology or medicine as well as electrical engineering. Areas include biological sensors and signals, signal and image processing, and analysis and modeling of biological systems.

In addition, the department offers double major programs designed to help students qualify for employment in either of two major fields of engineering, or for positions where competence in both fields is required. Both majors are listed on the transcript of record. Two such double majors are currently established:

EECS/Material Science and Engineering: For students interested in materials and devices, a double major in ECS/SE is available. This program combines the study of the properties of materials in a broad perspective, as taught in MSE, with the use-motivated background gained in EECS.

EECS/Nuclear Engineering: The EECS/NE double major combines the traditional EE program with one in the Nuclear Engineering Group. The degree shares with EE a concern for electrical power generation, automatic control, computer sciences, and plasmas.

Curriculum for the Bachelor’s Degree

A minimum of 120 semester units is required for the bachelor's degree in EECS, including:

1. (a) 45 units in the College of Engineering, including 30 upper division units. These units must include 30 units officially designated as engineering courses. Students who have completed fewer than 60 semester units by June 1988 must include at least one course chosen from the department's current list of courses that satisfy the engineering design requirement. Please refer to the list included in the department's Undergraduate Information Handbook.

(b) EECS 40 or EECS 401 or EECS 411; E45,\(^{3}\) and CS 60A, 60B.

(c) 20 upper division units in EECS, not including EECS 100.

(d) Three upper division laboratory courses in EECS.

\(^{3}\) Students may petition to substitute Biology 1A-1B, Molecular and Cellular Biology 122 (formerly Physiology 1), or CS 60C for E45 1991.

In the cases of Biology 1A-1B and MCB 32, the units will not be counted toward the engineering units. In the case of Biology 1A-1B, the entire course must be taken to satisfy the E 45 requirement. Students must be notified by the adviser, study list representative, and the undergraduate dean, except that in Program C, the substitution of CS 60C is automatic. For students not in Program C, substitution of CS 60C will be approved in writing when special circumstances make it unfeasible to take E45 1991.
(e) Five units of engineering, not in EECS or CS. Among IDS courses, only 124, 131, and 180 satisfy this requirement. Chemical engineering courses may be applied to this requirement, but they will not count toward the 45 units required by the College of Engineering. Engin 7, Engin 45, and NA 10 may not be used to satisfy this requirement.

(f) For students in the General, the Electronics, and the Systems Programs: any four courses chosen from the following list: EECS 104; EECS 117A; EECS 120; EECS 130; CS 60C or CS 150 or CS 170. For students in the Bioelectronics Program, the requirement is the same, except that Molecular and Cell Biology 1A may be substituted for one of the five courses listed above. Students in the Computer Science program are expected to include 16 units of upper division computer science course work in their programs.

2. 16 units of physical or life sciences, including Chemistry 1A and Physics 7A-7B-7C.

3. 16 units of mathematics or statistics from the current list of acceptable courses, including Mathematics 1A-1B, or 8 units of Mathematics 1S.

4. 43 units of electives, with no more than 40 taken on a passed/not passed basis. No more than 3 units of English-as-a-Second Language, 4 units of physical education, or 7 units of Course 195 (independent study) may be counted toward the degree. Six courses of at 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 a 4-unit course in English composition, 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 a course 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. It is expected that the course in English composition will be taken at Berkeley, not at other schools. Note: None of the 77 units in requirements 1, 2, and 3 may be taken on a passed/not passed basis except CS 9C, CS 9D, or 1d) laboratory courses, in which case these courses cannot be used to satisfy requirements 1(c) and 2(c).

Further details on the sequence of courses is required, students are free to design programs to suit their particular needs and interests, in consultation with an advisor in their field. Graduate program courses 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 about one year of study. About three additional years are usually required for the Ph.D. 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 non-technical subject, usually 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 Ph.D. Engineering should apply first for the M.Eng. program.

Details of the available fields of graduate study in the College of Engineering and the requirements for admission are described in the Announcement of the College of Engineering. For further information on graduate programs and procedures, see the Electrical Engineering and Computer Sciences Graduate Information Booklet, available in 298 Cory Hall.

Computer Science Service Courses

The courses IDS 110, IDS 110L, E 7, E 7S, CS 3, and CS 9A-9B-9C-9D-9E are the current set of "computing service" courses. Introductory computing courses taught in other departments may be treated as computing service courses at some point in the future. The following restrictions on credit toward graduation apply to the current set of service courses.

Students get full credit toward graduation for the first of the computing service courses successfully completed and 1 unit toward graduation for any subsequent nonequivalent service course.

E7 (formerly CS 7) is equivalent to 3 units of E 7S (formerly CS 7X)

Students get 1 unit toward graduation for any computing service course taken after CS 60A.

Students may gain at most 5 units toward graduation for computing service courses.

Electrical Engineering

Lower Division Courses

40. Introduction to Electrical Engineering. (4) Three hours lecture and one hour discussion per week. Prerequisites: Mathematics 1B and Physics 7B. Passive circuit analysis, analog building blocks and analog systems, digital building blocks and digital systems, semiconductor devices, electronic circuits. (F,SP) Ko, Schwarz

401. Introduction to Electrical Engineering (self-study). (4) Four hours of discussion per week. Prerequisites: Mathematics 1B and Physics 7B. Passive circuit analysis, analog building blocks and analog systems, digital building blocks and digital systems, semiconductor devices, electronic circuits. (F,SP) Ko, Schwarz

41. Introduction to Electrical Engineering (self-study). (2) Two hours of discussion per week. Prerequisites: A course in analysis of passive circuits. Intended for transfer students arriving with backgrounds containing only part of EECS 40 or EECS 401. Instructional format as in EECS 401. Analog building blocks and analog systems, digital building blocks and digital systems, semiconductor devices, electronic circuits. (F,SP) White

42. Introduction to Electronics for Computer Science. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 1B. Fundamental principles of electrical engineering with emphasis on those of particular interest to students of computer science. It is intended that laboratory course EECS 42 be taken concurrently. Electrical circuits, electric circuits, analysis of passive dc circuits; transient response of passive circuits; sinusoidal steady state response of passive circuits; operational amplifiers; diodes; bipolar transistors; DTL, TTL, and CMOS logic circuits. (F,SP) Mead

43. Introductory Electronics Lab. (1) Two hours of laboratory per week. Must be taken on a passed/not passed basis. Prerequisites: 40 or 42 (may be taken concurrently). Introductory electronics laboratory. Emphasis on understanding the equipment and laboratory technique using an oscilloscope, power supplies, multimeter, curve tracer, spectrum analyzer and LCR bridge. No final examination. (F,SP) Staff

100. Electronic Techniques for Engineering. (4) Three hours of lecture and 3 hours of laboratory per week. Prerequisites: Mathematics 1B, Physics 7B. Analysis of passive circuits; sinusoidal steady-state 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) Staff

104. Linear and Nonlinear Circuits. (5) Four hours of lecture and two hours of discussion per week. Prerequisites: EECS 104 or EECS 40. Electromagnetic field theory, waveguides, transmission lines, microwave circuits. (F,SP) Staff

110. Electronic Circuit Interconnection. (2) Two hours lecture per week. Prerequisites: 104, 140, 117A, and Computer Science 150. A study of the problems associated with interconnecting electronic circuits, e.g., noise pickup in low level circuits, degradation of high speed signals in cables, printed circuit boards, connectors, power distribution, and associated packaging and cooling considerations. (SP) Staff

112. Electrical Transformers and Machines. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 40. Study of magnetic circuits, transformers, and electromagnetic energy conversion devices—including dc and ac motors and generators. (F) Staff

113. Power Electronics. (3) Three hours of lecture per week. Prerequisites: 104. Power semiconductor devices including thyristors. Magnetic components. Power transmission circuits, power transformers, applications to motor control, switching power supplies, and power systems. (SP) Sanders


117A. Electromagnetic Fields and Waves—I. (4) Three hours lecture and one hour discussion per week. Prerequisites: 40. (may be taken concurrently). Review of static electric and magnetic fields and applications; Maxwell's equations; transmission lines; propagation and reflection of waves; introduction to guided waves. Minilabs on statics, transmission lines, and waves. (F,SP) Birdsell, Mei, Van Duzer

117B. Electromagnetic Fields and Waves—II. (4) Three hours lecture and one hour discussion per week. Prerequisites: 117A. General methods of solving field problems; microwave and optical waveguides; resonant systems; electromagnetic of materials; radiation and diffraction. (F,SP) Birdsell, Welch

118. Introduction to Optical Communications Systems. (3) Three hours of lecture per week. Prerequisites: 104, 140. Introduction to the basic principles of optical communications and optical information processing systems. Emphasis on principles of optical links, including the transmitter, optical

121. Noise Analysis of Communications Systems. (3) Three hours lecture and one hour discussion per week. Prerequisites: 120. Elementary probability and random process theory; description of modulation systems, AM, FM, digital transmission methods such as PM, FSK, QAM. Comparative noise analysis of modulation systems. Signal space concepts, error rate analysis of digital modulation systems, including noncoherent systems. (F,SP) Wong

122. Introduction to Communication Networks. (2) Two hours of lecture and one hour discussion per week. Prerequisites: 40, and Mathematics 50A. Network architectures. Protocols and routing in store-and-forward networks (e.g., ARPANET and IBM'S SNA); Satellite network (e.g., ARGO network). Local area networks (e.g., ETHERNET and Rings). Introduction to performance analysis. Some hardware issues (e.g., VLSI controllers, fiber optics). (SP) Walrand

123. Digital Signal Processing. (4) Three hours lecture and one hour discussion per week. Prerequisites: 120. Discrete time signals and systems: Fourier and Z transforms, DFT, 2-dimensional versions. Digital signal processing topics: recursive and nonrecursive filtering, FFT, chirp-Z algorithms. Hilbert transform relations, quantization effects, linear prediction. Digital filter design methods: windowing, frequency sampling, S-to-Z methods, frequency-transformation and minimum max methods, 2-dimensional filter design. (F,SP) Staff

124. Spectrum Analysis Lab. (1) One 4-hour laboratory every other week. Prerequisites: 120 (may be taken concurrently). Measurement of frequency spectra. Periodic waves; aperiodic waves, AM, FM, and PCM; voice and noise waves. (F,SP) Thomasian

125. Introduction to Robotics. (2) Two 1½ hour lectures and 1 hour recitation. Prerequisites: Computer Science 40, knowledge of calculus, 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 movements of complex-robot programs. Ciphers, robot language, Proximity, tactile and force sensing. (F,SP) Cann, Fearing

128. Feedback Control. (4) Three hours lecture and one 3-hour laboratory per week. Prerequisites: 120. Analysis and synthesis of continuous and sampled-data feedback systems. Feedback system design. Analysis of feedback systems. Design by root locus, frequency response, and state space methods, with a comparison of techniques. Case studies. (F,SP) Bergen

130. Integrated-Circuit Devices. (4) Three hours lecture and one hour discussion per week. Prerequisites: 40 and Computer Science 20. Overview of basic microcircuit physical mechanisms. The electronics of metal-semiconductor contacts, pn junctions, bipolar transistors, and of junction and MOS field-effect transistors. Properties of FETs and their use in digital and mixed-mode circuits. Silicon device and circuit technology. (F,SP) Hu, Muller

131. Semiconductor Electronics. (3) Three hours of lecture per week plus several one-hour mini-labs. Prerequisites: 130 (which may be taken concurrently). Formerly 130, 131B and a portion of 134. Physics of solid-state electronics. Review of quantum-mechanical principles, crystal structure, lattice vibrations, band theory, electrons and holes, diffusion and drift, recombination, high-field phenomena, optical effects, device applications. Several one-hour mini-labs in pairs with the aid of a Teaching Assistant. (F,SP) Gustafson

134. Microwave Communication Design. (3) One hour lecture and one 3-hour laboratory per week. Prerequisites: 117B or 118 and 120. Design and control of microwave communication systems. Components such as transistors, filters and amplifiers are designed, fabricated, and tested in practical communication systems. (SP) Meiri

135. Microwave, Optics and Plasma Laboratory. (2) One hour lecture and four hours laboratory per week. Prerequisites: 117A and Physics 7C. Six fundamental experiments (characteristics of antennas, microwave components, network analyzer measurements, laser optics, electronic discharges, and electromagnetic wave propagation), and five specialized experiments to be chosen from available in optical, microwave, and plasma devices and measurements. (SP) J. Smith

136. Introduction to Quantum and Optical Electronics. (3) Three hours lecture per week. Prerequisites: 117A and Physics 7C. The laser principle and laser physics. Quantum optics and coherent optics; fiber optic devices, laser optics and integrated optics; interactions between coherent optical beams and materials; modulation of lasers and detection; other applications. (SP)

140. Analog Integrated Circuits. (4) Three hours class, three hours laboratory and one hour discussion per week. Prerequisites: 120 (may be taken concurrently). Introduction to analog integrated circuits. Bipolar and MOS transistor models. Single stage and two stage transistor amplifiers. Emitter coupled pairs, source coupled pairs, temperature and power stabilizers. Frequency and power amplifiers. Response, feedback concepts, feedback amplifier theory and design, root locus, noise in integrated circuits. MOS analog circuits. (F,SP) Broderson, Hsiao

141. Digital Integrated Circuits. (4) Three hours lecture, three hours laboratory and one hour discussion per week. Prerequisites: 40 and 104; 130 recommended. Introduction to digital integrated circuits. Large signal models for bipolar and MOS transistors. Inverters, inverters, delay and noise margins. Dynamic logic concepts. Bipolar transistor inverter design and gates. Regenerative logic circuits. Memories. (F,SP) Jackson, Neureuther, Spanos

142. Integrated Circuits for Communications. (4) Three hours lecture and one hour discussion per week. Prerequisites: 40, 104, and 140. Analysis and design of electronic circuits for communication systems. Analysis of distortion in amplifiers. Design of power amplifiers and voiceband nonlinear circuits. Oscillators, mixers, voltage-controlled oscillators, phase-locked loops. (F,SP) Meyer, Pederson

143. Processing and Design of Integrated Circuits. (4) Three hours lecture and three hours laboratory per week. Prerequisites: 130. Integrated circuit technology; circuit design, device modeling, and layout. An introduction to microelectronics. Materials and device processing. MOS transistors and circuit design. (F,SP) Cheung, Oldham

145A. Sensors, Actuators and Electrodes. (4) Three hours lecture and one hour discussion per week. Prerequisites: 40 plus elementary chemistry and physics. Introduction to the physical bases of transduction. Sensing and converting motion, thermal, chemical, and electromagnetic transducers. Design and construction of circuits for transduction. Applications of lumped- and distributed-parameter systems. Introduction to the design and analysis of sensor and actuator systems in acoustics, optics, mechanics, fluid dynamics, and biophysics. Electro-optical and electrodynamic devices. Electrochemical methods of transduction. Biological sensors and actuators. (F) Lewis

145B. Computer Applications in Biology and Medicine. (3) Three hours lecture and one hour discussion per week. Prerequisites: 140. Transformations utilizing digital computers, of biological and medical systems, for use in experimental research and for applications to medical diagnosis and medical systems management. (SP) Budinger

145L. Introductory Electronic Transducer Laboratory. (2) Three hours laboratory and one hour lecture per week. Prerequisites: 140. Laboratory exercises on using sensors and transducers for measuring temperature, force, displacement, sound, light, ionic potential. Covers principles of operation, construction, response, signal to noise. Use of circuits for analog signal processing and microcomputers for digital sampling and storage. (F) Denero

145M. Introductory Microcomputer Interfacing Laboratory. (2) Three-hours laboratory and one hour lecture per week. Prerequisites: 140 and either Computer Science 7 or equivalent basic programming course. Course is useful in constructing basic circuits and interfacing them to a microcomputer for the filtering and periodic sampling of analog signals. Programming exercises (FORTRAN or C) to sample analog signals, perform digital filter design, perform analysis, real-time control, and display. (SP) Denero

146. Dynamic Networks in Biology. (3) Three hours lecture per week. Prerequisites: 40 or Mathematics 50B. Introduction to the application of engineering modeling and analysis methods to continuous and discrete biological and stochastic biological processes. Network formats used to deal with cellular, organismal, and population phenomena. (F) Keller

147. Electrical Radiation and Safety. (2) Two hours lecture per week. Prerequisites: 104. Occupational and environmental hazards associated with electrical devices, notably in clinical situations, and administrative and technical methods for minimizing dangers. (F) Susskind

198. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. To vary with section. Must be taken on a pass/no pass basis. Prerequisites: 2.0 GPA or better; 60 units completed. Group study of selected topics in electrical engineering, usually relating to new developments. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course is not required for 40 units per quarter. May be repeated for credit. To vary with section. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor and major adviser. Supervised independent study. Please see pages 91-92 of the General Catalog for description and prerequisites. (F,SP) Staff

205. Electron and Gaseous Devices. (2) Two 1-hour lectures per week. Prerequisites: 117A. Theory and applications of vacuum and gaseous devices, with emphasis on devices of the electron-microscope type used for microbeam analysis. (SP)


216. Microwave Antennas. (3) Three 1-hour lectures per week. Prerequisites: 210A or consent of instructor. Application of Maxwell's equations to single antennas
217. Microwave Circuits. (3) Three 1-hour lectures per week. Prerequisites: 117A. Techniques of analog circuit technology in the high-frequency regime above 1 GHz. Topics include: 1) lumped elements; 2) parameter design of high-frequency active circuits; 3) computer-aided analysis and design. Emphasis on design of planar high-frequency circuits. (F) Schwarz


221B. Multivariable Feedback Systems. (3) Three hours of lecture per week. Prerequisites: 221A or equivalent and one undergraduate control course. MIMO feedback systems. Matrix fraction description. Stabilization, tracking, disturbance rejection. Two degrees of freedom design. Robustness. Large scale interconnected systems. Linear Quadratic Optimal Control. (SP) Desoer

222. Nonlinear Systems Analysis, Stability and Control. (3) Three hours of lecture per week. Prerequisites: 221A (may be taken concurrently). Basic graduate course in non-linear systems. Second Order systems. Numerical solution methods, the describing function method, root locus - direct and indirect methods of Lyapunov. Applications to the Lure problem - Popov, circle criterion. Input-Output stability. Additional topics include: bifurcations of dynamical systems, Introduction to chaos, Nonlinear mechanics. (SP) Desoer


224. Digital Communication. (3) Three 1-hour lectures per week. Prerequisites: 121 and 226, or equivalent. Design of baseband and passband digital communication systems. Characteristics of media, modulation alternatives including PM, FSK, and spread spectrum. Intersymbol interference and adaptive equalization. Line, convolutional, and trellis coding. Timing and carrier recovery, multiplexing and multiple access, network synchronization. (SP) Messerschmitt

225A. Digital Signal Processing. (3) Three hours lecture per week. Prerequisites: 123 and 226, or equivalent. Formerly EECs 225. Advanced techniques in signal processing. Time and frequency domain processing, transforms, frequency response, digital spectral estimation, adaptive filtering and estimation. Detailed treatment of speech processing, image processing or video encoding, as well as radar signal processing. (SP) Messerschmitt

225B. Multidimensional Signal Processing. (2) Two hours of lecture per week. Prerequisites: 123. Multidimensional signal and system analysis, design and representation. Implicit and explicit sampling schemes, fourier transform, z-transform and implementation of FIR and IIR filters. Additional topics deal on dependents of instructor and may include: Signal reconstruction from partial information, Array processing, beamforming and direction finding, image processing, enhancement, restoration, compression and coding. (F) Zakhov

225C. VLSI Signal Processing. (3) Three hours of lecture per week. Prerequisites: 142, 123. Formerly 220M. Design of signal processing systems building on convex and stochastic optimization techniques. Synthesis techniques. (SP) Brodersen, Rabaeby


227A. Optimization Techniques. (3) Three 1-hour lectures per week. Prerequisites: Advanced calculus. First and second order optimality conditions and their role in the construction of optimization algorithms. Algorithms for unconstrained and constrained nonlinear programming and optimal control problems. Duality and sensitivity. Elementary linear and quadratic programming. (SP) Potok

227B. Optimization in Engineering Design. (3) Course may be repeated for credit with the consent of the instructor. Three 1-hour lectures per week. Prerequisites: 227A or consent of instructor. Formulation of engineering design problems as semi-infinite optimization problems. Examples from electronic circuit, control system and structural design. Semi-infinite optimization and optimal theory and algorithms. (F) Polak

228. Communication Networks. (2) Two hours of lecture per week. Prerequisites: 122 and 226, or equivalent. Principles of design and analysis of communication networks. Packet, circuit, and hybrid networks. Protocols and error control. Flow control, flow control error recovery. MM/1 and M/G/1 queueing theory and its application to analysis of networks, including delay and blocking. (SP) Wainwright, Thomasian

229. Information Theory and Coding. (3) No credit after taking 229B. Three hours of lecture per week. Prerequisites: 228, recommended, Statistics 204A or equivalent. Formerly EECS 229B. Fundamental bounds of Shannon theory and their application. Source and channel coding. Galois field theory, algebraic error-correction codes. Private and public-key cryptographic systems. (SP) Cover


231. Solid-State Devices. (3) Three 1-hour lectures per week. Prerequisites: 130 or equivalent. Physical principles, fabrication considerations, and operational characteristics of semiconductor devices. Mechanisms of carrier transport in solids and at interfaces, high-field and hot carrier effects. Advanced discussion of bipolar and field-effect transistors with emphasis on the behavior dictated by present and probable future technologies. (SP)

236A-236B. Quantum and Optical Electronics. (3) Three 1-hour lectures per week. Prerequisites: 117A, Physics 137A or equivalent. The laser principle; analysis of specific laser systems such as gas lasers, semiconductor lasers, and other solid-state lasers; laser dynamics, noise phenomena, nonlinear optics; wave optics; selected applications of coherent optics. (F,SP) J. Smith

237. Quantum Electronics of Solids. (3) Three 1-hour lectures per week. Prerequisites: 117B, Physics 137A or equivalents. Optical properties of solids; electro-optic and magneto-optic effects; nonlinear optical effects; selected applications of semiconductor devices and integrated optics and fiber optics. (SP) Gustafson


239A. Partially Ionized Plasmas. (3) Three 1-hour lectures per week. Prerequisites: 117A or Physics 110A; 117B or Physics 110B recommended. Introduction to cold and cool plasmas, including collisional processes, diffusion, and sources; line and continuum spectra, probes and other diagnostics. DC and RF discharges. Electron and ion beams. Applications to plasma-assisted materials processing and to fusion first walls. (F) Lieberman


241. Advanced Digital Integrated Circuits. (3) Three hours of lecture per week. Prerequisites: 141. Analysis and design of MOS and bipolar large-scale integrated circuits at the circuit level. Fabrication processes, device characteristics, parasitic effects static and digital dynamic circuits for logic and memory functions. Calculation of speed and power consumption from layout and fabrication parameters. ROM, RAM, EERROM circuit design. Use of SPICE and other computer aids. (F,SP) Raby

242. Advanced Integrated Circuits for Communications. (3) Three 1-hour lectures per week. Prerequisites: 142, 240. Analysis, evaluation and design of present-day integrated circuits for communications applications. Design and implementation of co-processors and high-performance mixed signal integrated circuits. Use of new CAD tools and systems. (F) Meyer

243. Advanced IC Processing and Layout. (3) Three 1-hour lectures per week. Prerequisites: 142, 143. Two hours of lecture and one hour discussion per week. Prerequisites: 140 or 141 or 142 or 143. The key processes for the fabrication of integrated circuits. Optical, X-ray, and e-beam lithography, ion implantation, oxidation and diffusion, chemical mechanical film deposition. Wet and dry etching and ion milling. Effect of phase and defect equilibrium in process control. (SP)
240. 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 the state-of-the-art techniques and both the theoretical basis for the methods as well as the application of results to practical problems, including details of implementation. Topics may include simulation, layout techniques, synthesis, verification, testing, and integrated design systems. (F) Brayton, Sangiovanni-Vincentelli

245. Biomedical Instrumentation. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Nuclear analytical and imaging and blood flow measurement principles. State-of-the-art techniques in medical instrumentation to measure parameters of direct clinical significance, nuclear magnetic resonance, electron spin resonance, viscosity determinations, etc. Transducers, amplifiers, and computers necessary for implementation of these techniques. The human as an element within intelligent feedback systems.

246. Biological Systems. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Advanced application of linear and nonlinear systems techniques to the modeling and analysis of biological phenomena. (SP) Keller

290A. System Theory. (2) Course may be repeated for credit. Two hours of lecture per week. Recent developments and coverage includes system theory-oriented toward advanced students. (SP) Sanders


290C. Advanced Circuit Theory. (1-2) May be repeated for credit. Two hours lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Current research topics in electrical circuits, networks, and systems. Typical subjects include device modeling, computer-aided circuit design, circuit layout, large-scale networks and systems, stability, sensitivity, nonlinear oscillators, and state space dynamics.

290D. Superconductive Integrated Circuits. (3) Three 1-hour lectures per week. Prerequisites: 140 or 141 and 117A. The aim of this course is to provide tools for the design and analysis of superconductive integrated circuits. Basic concepts in superconductivity and Josephson junctions. Equivalent circuits and analogs. Calculation of circuit elements. CAD tools: Noise. Fabrication technology. Analog and digital circuits. Project.

290E. Regular and Stochastic Motion in Dynamical Systems. (3) Three 1-hour lectures per week. Prerequisites: An upper division course in dynamical mechanics or consent of instructor. Integrable and near integrable systems, canonical perturbation theory, Lie transforms, mappings, KAM theory, fixed points and linear stability, tranquility to global stochastic, KS entropy, Lianpau exponents and diffusion, Arnold diffusion, dissipative systems and strange attractors.

290F. Mathematical Methods in Electromagnetic Theory. (3) Three 1-hour lectures per week. Prerequisites: 210A-210B or consent of instructor. Current techniques for solving boundary value problems which arise in electromagnetic theory.

290G. Solar Cells and Semiconductor Power Devices. (3) May be repeated once for credit. Three 1-hour lectures per week. Prerequisites: 130. Topics in solid state electronics, semiconductor devices, physics, advanced concepts, production technologies, Applications, systems and circuits, economics.

290H. Computer-Aids for IC Design. (3) Three 1-hour lectures per week. Prerequisites: Consent of instructor. Recent developments of algorithms and techniques for computer-aided design of integrated circuits. (SP)

290I. Advanced Topics in Statistical Communications Theory. (2) Course may be repeated for credit. Two hours lectures per week. Prerequisites: 224 and 226. Advanced topics of instructor's choosing in detection and estimation theory, information theory, and digital communications. Typical topics include advanced coding theory, fiber optics systems, multiple access and multiplexing.

290J. Image Processing. (3) Two and one-half hours of lecture per week. Prerequisites: Basic programming skills and either 121 or 145B. Theory and practical applications of one and three dimensional photon emission, transmission, and NMR imaging. Course topics include image manipulation and restoration, noise filtering, Fourier and iterative 3-D image reconstruction and multispectral imaging including display methods. Applications include biological, medical and physical sciences. Budinger

290K. Solar Thermal Electric Systems. (3) Three hours lecture and one hour laboratory per week. Prerequisites: Engineering 161 or equivalent. Systems to collect, store, transmit, and deliver to consumers solar and wind energy, including photo voltaics. Cost, engineering properties, and performance of solar receptors, heat transport and storage, thermodynamic systems, and heat rejection systems. Cost minimization programs. Hybrid bottoming cycles. Environmental impact.


290LS. Computer-Aided Design of Integrated Circuits: Logic Design. (4) Two 1½-hour lectures and one 1-hour advanced study seminar per week. Prerequisites: Permission of instructor. Topics relating to the automatic synthesis, verification and testing of logic circuits. Topics include: minimization algorithms, multiple-value minimization, and multi-level circuit synthesis. (F)

290N. Integrated Circuit Technology Design. (3) One 2-hour lecture and one 3-hour laboratory per week. Prerequisites: 140 or 143. Current problems in integrated circuit design and fabrication are presented with emphasis on: (sub micron) lithography issues; methods of dielectric and metal deposition and plasma nitration; design of visual and electrical test patterns; and in process monitoring and control. (F) Neureuther

290O. Microsensors and Microactuators. (2) Two 1-hour lectures per week. Prerequisites: 130 and 143, or consent of instructor: Fundamental principles, fabrication technology, and constraints. Technology of microsensors and microactuators made by integrated-circuit manufacturing processes and including integrated electronic circuits for control, signal conditioning, and output. (SP) Howe, Muller, White

290P. Thin Film Technology for IC Fabrication. (3) Three 1-hour lectures per week. Prerequisites: 143 or consent of instructor. Equivalent course. The course will focus on the preparation and properties of thin film electronic materials (dielectrics, metals, single-crystal and polycrystalline semiconductors, and oxides). Topics include dielectric and metal deposition techniques; theories of condensation, nucleation and growth of Thin Films; Deposition Techniques (CVD, vaporization, sputtering); Epitaxial Growth of Semiconductor Structures; Stress and Defects and Impurities in Thin Film Interface (dielectrics, metals and Heterojunctions).

290Q. Plasma Simulation. (3) May be repeated for credit. Three hours lecture per week. Prerequisites: 157 or Physics 142. Current techniques in plasma simulation using many particle fluid models on computers. Also includes computer simulation of laser, plasma, and fusion devices. (SP) Watanabe

290R. Advanced Topics in Random Processes and Queuing. (2) Course may be repeated for credit. Two hours lecture per week. Prerequisites: 117A, Physics 115 and graduate standing. Advanced topics of instructor's choosing in random processes and queuing theory. Topics include martingale theory, stochastic calculus, random fields, and queueing networks, stochastic control. (SP) Watanabe

290S. Topics in Quantum Electronics. (3) Three hours of lecture per week. Prerequisites: 117A, Physics 115 and graduate standing. Recent developments and coverage techniques in electron and nuclear spin resonance phenomena, and electronic spin resonance description, resonance instrumentation, spin echo, optical spin echo (with lasers). Problems of detection of resonance phenomena in noise. Coherent detection, signal averaging, computer processing of periodic signals. (SP)

290T. Advanced Topics in Signal Processing. (2) Course may be repeated for credit. Two hours lecture per week. Prerequisites: 226 and 225. Advanced topics of instructor's choosing in signal processing. Typical topics include spectral estimation, inverse problems, modern signal processing, filters, and digital signal processing. Filter design, real-time and multiprocessor implementations, dedicated IC architectures, digital filtering, advanced software techniques. (SP)

290U. Digital Computers in Experimental Systems. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. A detailed study will be made of one or more experimental systems which intimately involve the use of digital computers. The specification will be made of the specific problems and interests of the class from fields such as biology, physics, psychology.

290V. Adaptive and Identification Systems. (3) Three hours of lecture per week. Prerequisites: Statistics 200A. Adaptive, control, and measurement systems responsive to changes in commands, disturbances, components, and models. Time-varying systems. Identification of unknown systems by use of adaptive models, error steepness descent, and instrumental variables. Not to be offered twice. Understanding of parameters. Convergence with noisy and noiseless state variables.

290W. Special Issues in Semiconductor Manufacturing. (3) Course may be repeated for credit. Two 1-hour lectures per week. Prerequisites: 140 or 141, 143; Statistics 135 or equivalent. Covers high volume IC production emphasizing process and equipment characterization, technology and circuit design for manufacturability, statistical process control and computer integrated manufacturing systems, Independent Group Projects. (SP) Spanos

290X. Radio Telescopes. (3) Three hours of lecture per week. Prerequisites: 117A. Synthesis of celestial brightness distribution from measurements on the radio horizon. Parabolic, spherical, cruciform and interferometric antennas. Occultation and scintillation measurements. Atmospheric effects and intensity interferometers.

290Y. Critical Problems in Communications Integrated Circuits. (2) Two 1-hour lectures per week. Prerequisites: Consent of instructor. A critical analysis of recent critical integrated circuits in communication applications. Broad-band, power amplifiers; maximum frequency of bipolar collpit's oscillators and mixers; advanced bipolar MOS A/D conversion techniques including oversampling and self calibration; new configurations for telecommunication including filter- optic receivers, data-communication clock recovery: multi-moding in digital modulators; CAD tools or analog IC design including synthesis, distortion and noise analysis."
298. Group Studies, Seminars, or Group Research. (1-4) May be repeated for credit. Lecture: hours to correspond with unit value, Section 1-40: S/U grading; sections 41-48: letter grade. Advanced study in various subjects through special seminars on topics to be selected each year, informal groups study 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) May be repeated for credit. Independent, individual study or investigation. Investigation of problems in electrical engineering. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) May not be taken for unit or resident requirements for the doctoral degree, may be repeated for credit. Independent study, in consultation with faculty member. 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. (and other doctoral degrees). (F,SP) Staff

Professional Courses

301. Teaching Techniques for Electrical Engineering. (1) One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Weekly seminars and discussions. Topics include teaching techniques. Use of educational objectives, alternative forms of instruction, and special techniques for teaching key concepts and techniques in electrical engineering. Student and self-evaluation. Course is intended to orient new graduate student instructors to teaching in the Electrical Engineering department at Berkeley. (F) Staff

Intermediate Studies Courses

Lower Division Course


Upper Division Courses


IDS 180. Economic and Biological Feedback Systems. (3) Three hours lecture per week. Prerequisites: Mathematics 51 or equivalent. Feedback sequences, manifest types, data-directed programming, and system programming. Utility programs, subsys-tems, multiple-program systems. Proces-ses, interrupts, memory management, process switching. Assembly and high-level language programming. Assemblers and linkers. (F,SP)

60C. Data Structures and Advanced Programming. (4) Three lecture hours, one hour discussion, and two hours of programming laboratory per week. Prerequisites: 60A, 60B, mathematics 55 or 113 (math courses may be taken concurrently). Advanced programming techniques. Mathematical reasoning about programs. Principles of software engineering applied to a large programming project. Review of elementary data structures: arrays, linked structures, queues, stacks. Advanced data structures and algorithms: graphs and trees, strings, searching, sorting, hashing. (F,SP)

60D. Operating Systems and System Programming. (4) Three hours lecture, one hour discussion and four hours unscheduled laboratory per week. Prerequisites: 60C. Basic computer organization and operation of digital computers. Machine architecture support for data types (numbers characters, strings), data structures (arrays, stacks, lists), program structures (loops, procedures, subroutines, system programming systems (I/O, interrupts, memory management, process switching). Assembly and high-level language programming. Assemblers and linkers. (F,SP)

Computer Science

Please refer to the Computer Science Service Courses section preceding the Electrical Engineering course listings.

Lower Division Courses

*3. Introduction to Symbolic Programming. (4) At the most, 5 units may be earned in total for this course plus courses numbered less than 10. Two hours of lecture, one hour of discussion, self-paced lab (6 hours per week average). Prerequisites: High school algebra. This course introduces computer programming emphasizing symbolic computation and functional programming style. Students will write a project of at least 200 lines of code, in a dialect of the LISP programming language. Clancy

*3S. Self-Paced Introduction to Symbolic Programming. (1-4) CS 91A. At the most, 5 units may be earned in total for this course plus courses numbered less than 10. Course may be repeated for up to 4 U One - Four hours of discussion and three - nine hours of programming laboratory per week. Prerequisites: High school algebra. Self-paced introduction to computer programming, emphasizing symbolic computation and functional programming style. Students will write a project of at least 200 lines of code, in a dialect of the LISP programming language. Same material as CS 3 but in a self-paced format. Units assigned depend on amount of work completed. First two units of CS 3S must be taken together. Course is a "Computer Science Service Course"; credit restriction Self-paced at the SFSU. CSEE section of the General Catalog. Clancy

*8S. Self-Paced Introduction to Programming. (1-4) Refer to computer service course restriction. Self-paced. Prerequisites: High school algebra. The same material as 8 but in a self-paced format. Units assigned depend on amount of work completed. First two units of CS 8S must be taken together. Course is a "Computer Science Service Course"; credit restriction Self-paced at the SFSU. CSEE section of the General Catalog. Clancy

9B. Pascal for Programmers. (1) Refer to computer service course restriction. Self-Paced. Must be taken on a passed/not passed basis. Prerequisites: Programming 7 (formerly Computer Science 7), or equivalent Self-paced Fortran course for students who already know how to program. Solution of problems drawn from numerical applications, e.g., root finding, numerical integration, curve fitting, matrix manipulation, and graphing. (F,SP) Clancy

98. Pascal for Programmers. (1) Refer to computing service course restriction. Self-Paced. Must be taken on a passed/not passed basis. Prerequisites: Programming 7 (formerly Computer Science 7), or equivalent Self-paced Pascal course for students who already know how to program. Solution of problems drawn from numerical applications. (F,SP) Clancy

9A. Introduction to Fortran for Scientific Computation. (1) Refer to computing service course restriction. Self-Paced. Must be taken on a passed/not passed basis. Prerequisites: Programming 7 (formerly Computer Science 7), or equivalent Self-paced Fortran course for students who already know how to program. Solution of problems drawn mainly from nonnumerical applications. (F,SP) Clancy

9C. C for Programmers. (1) Refer to computer service course restriction. Self-Paced. Must be taken on a passed/not passed basis. Prerequisites: Programming 7 (formerly Computer Science 7), or equivalent Self-paced course in the C programming language. Solution of problems drawn mainly from UNIX system programming applications. (F,SP) Clancy

9D. Lisp and Functional Programming. (1) Refer to computer service course restriction. Self-Paced. Must be taken on a passed/not passed basis. Prerequisites: 98 or equivalent. Introduction to the Lisp programming language and the techniques of functional program- ming. Lectures, laboratory, homework. Optional homework with pointers in a high-level language. Self-paced course in the C programming language. Solution of problems drawn mainly from UNIX system programming applications. (F,SP) Clancy

60A. The Structure and Interpretation of Computer Programs. (4) Two hours lecture, two hour discussion, and six hours self-paced programming laboratory per week. Prerequisites: Mathematics 1A (may be taken concurrently); 3 or the Advanced Placement Computer Science A. 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 programming languages, using functional and rule-based languages as intermediate layers. The course is intended to provide a comprehensive view of the field. Students will be required to write a term paper, based on relevant literature, exploring in greater depth one of the topics covered in the lectures.

99. Individual Study and Research for Under-graduates. (1-2) May be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: 7 or equivalent; GPA of 3.4 or better. A course for lower division students with a minimum GPA of 3.4 who wish to undertake a program of individual inquiry initiated jointly by the student and a professor. There are no other formal prerequisites, but the supervising professor must be convinced that the student is able to profit by the program. (F,SP)

Upper Division Courses

150. Components and Design Techniques for Digital Systems. (5) Three hours lecture and three hours laboratory per week. Prerequisites: 60B, EECS 40 or 42, EECS 43 recommended. Basic building blocks and design methods to construct synchronous digital systems. Alternative representations for digital systems. Bipolar TTL vs. MOS implementation techniques. Standard logic (SSI, MSI) vs. programmable logic (PLD, PGA). Finite-state Machine design using microcomputer design blocks as case studies. Introduction to computer-aided design software. Formal hardware laboratories and substantial design project. Informal software laboratory periodically throughout semester. (F,SP)

152. Computer Architecture and Engineering. (5) Three hours lecture and two hours discussion per week and one large design project. Prerequisites: 150. Instruction set design, Register Transfer design project requiring about 100 hours. Data-path design, gatherer design. Addressing, Microprogramming. Computer arithmetic. Survey of real computers and microprocessors. (F,SP)

162. Operating Systems and System Programming. (4) Three hours lecture, one hour discussion and four hours unscheduled laboratory per week. Prerequisites: 60C. Basic computer organization and system programming. Utility programs, subsystems, multiple-program systems. Processes, inter-
process communication and synchronization. Memory allocation, segmentation, pacing. Loading and linking, libraries. Resource allocation, scheduling, performance evaluation. File systems, storage devices, I/O systems. Protection and privacy. (F,SP)

164. Programming Languages and Compilers. (4) Three hours lecture, 1-hour discussion per week. Prerequisites: 60C. Survey of programming languages. The design of modern programming languages. Principles and techniques of parsing, passing semantic analysis, and code generation. Implementation of compilers, interpreters, and assemblers. Overview of runtime organization and error handling. (F,SP)

170. Efficient Algorithms and Intractable Problems. (4) Three hours lecture and one hour discussion per week. Prerequisites: 60C, Mathematics 55 or 113A. Concepts and techniques in the design and analysis of algorithms; models of computation; lower bounds; algorithms for optimum search trees, balanced trees and UNION-FIND algorithms; numerical and algebraic algorithms; combinatorial algorithms. Turing machines, how to count steps, deterministic and nondeterministic Turing machines, NP-completeness. Unsolvable and intractable problems. (F,SP)

172. Formal Languages and Automata Theory. (4) Three hours lecture and one hour discussion per week. Prerequisites: 160, Mathematics 55 or 113A. Variations on the theme of finite automata. Nonde- terminism and regularity. Properties of languages accepted by context-free grammars and pushdown automata. Turing machines and computability. Time and space bounded computation. Special classes of grammars and languages. (F,SP)

174. Combinatorics and Graph Theory. (3) Three hour lectures and one hour discussion per week. Prerequisites: 160, Mathematics 55 or 113A. Permutations, combinations, generating functions, recurrence relations, inclusion-exclusion principle, Polya's theorem, Hall's theorem; planar graphs, Euler graphs, Hamiltonian graphs, coloring problems; independence numbers, covering numbers. (F,SP)

184. Foundations of Computer Graphics. (4) Three hours lecture, one hour discussion and one 3-hour laboratory per week. Prerequisites: 60C, knowledge of linear algebra and calculus. Introduction to principles of computer graphics. Comparison of various display devices. Two- and three-dimensional transformations such as rotation, scaling, translation and their matrix representations. Homogeneous coordinate representations. Transformations include several formulations for perspective projection. Algorithms for clipping, hidden surface removal, antialiasing. Lighting models for reflection, transparency. Mathematical techniques for curve and surface representation. (F,SP)

186. Introduction to Database Systems. (4) Three hours lecture and three hours discussion per week. Prerequisites: 60C, knowledge of C. Access methods and file systems to facilitate data access. 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 programming interfaces and report writers. Introduction to transaction processing. Database system implementation to be done as term project. (F,SP)

188. Introduction to Artificial Intelligence. (4) Three hours lecture and one hour discussion per week. Prerequisites: 60C, or 60A and consent of instructor. Basic ideas and techniques underlying the design of intelligent computer systems. Topics include heuristic problem solving, search, game playing, knowledge representation, logical inference, planning, reasoning under uncertainty, expert systems, learning, perception, language understanding. (F,SP)

189. Introduction to Knowledge-Based Systems and Languages. (3) Three hours lecture per week. Prerequisites: 60C or 188 or consent of instructor. Knowledge engines, browsers and report writers. Prolog and logic programming; query languages and relational models of data. Question answering, inference, and information analysis. (F)

195. Social and Economic Implications of Computer Technology. (2) One 1½-hour lecture and one 1½-hour discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Major in Electrical Engineering and Computer Science or consent of instructor. Historical and social aspects of the birth of computing from Babbage to today. Current issues such as competition, price setting, job displacement, security and privacy, computer crime, weapons of mass destruction, management of large systems development projects. Projections for future development of computer technology. Philosophical and ethical issues concerning artificial intelligence. (SP)

H198. Honors Seminar for Computer Science Majors. (3) Three hours lecture per week. Project network. Must be taken on a passed/not passed basis. Prerequisites: 150, 60C, and 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. (F,SP)

198. Directed Group Studies for Advanced Undergraduates. (1-4) Course may be repeated for credit. Must be carried on a passed/not passed basis. Prerequisites: 2.0 GPA or better; 60 units completed. Group study of selected topics in Computer Sciences, usually relating to new developments. (F,SP)

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Must be carried on a passed/not passed basis. Prerequisites: Consent of instructor and major advisor. Supervised independent study. Please see pages 91-92 of the General Catalog for description and prerequisites. (F,SP)

Graduate Courses

250. VLSI Systems Design. (3) Three hours lecture and four hours design laboratory per week. Prerequisites: 150, Unified top-down and bottom-up design of integrated circuits and systems concentrating on architectural and topological issues. VLSI architectures, systolic arrays, self-timed systems. Trends in VLSI development. Physical limits. Tradeoffs in custom-design, standard cells, gate arrays. VLSI design tools. (F)

252. Graduate Computer Architecture. (4) Three hours lecture and three hours laboratory per week. Prerequisites: 125. Advanced knowledge of computer architecture. Design and analysis of computer systems covering early systems, CPU design, design techniques, design tools, language and compiler generation. Register Management. Flow analysis and control of data paths. Design of pipelined systems. For course, see also 257. (F)

254. Topics in VLSI Chip Design and Implementation. (4) Course may be repeated for credit. Three hours lecture and three hours design laboratory per week. Prerequisites: 250. Formerly 2920. Design implementation and testing of LSISVLSI multi-project chips. Apply the design techniques learned in CS 250 to build systems on silicon chips. Design for testability, programmability. Unit testing and systematic testing of the fabricated chips. (SP)


258. Parallel Processors. (2) Two hours lecture per week. Prerequisites: 252, 257. Parallelism, its representation; models and their properties. Parallelism detection, scheduling of parallel processes. Principle of pipeline computation, classification, scheduling; current architectures and language. Programs, deadlock, protocol, routing, global information management, security, distributed operating systems and databases. (F)

259. Fault Tolerant Systems. (2) Two hours lecture per week. Prerequisites: 252. Fault detection, location, and correction in hardware and software systems. Testing methods. Functional testing, reliability modeling and estimation static and dynamic redundancy. Examples of systems using several levels of fault tolerance and redundancy reconfiguration. Microdiagnostics. Software reliability models and their assessment. (F)

"*260. User-interfaces to Computer Systems. (3) Three hours lecture per week. Prerequisites: 162 and 164 recommended, or consent of instructor. Formerly CS 287. Design and implementation of user-interfaces to computer systems. Software and hardware archi- tectures of implemented operating systems and program- ming systems. Form-based user-interfaces. Window and display management abstractions. Case studies of naive- and expert-user interfaces. Students will complete a substantial project. (F)


262. Advanced Topics in Operating Systems. (4) Three hours lecture per week. Prerequisites: 162 and 164. Introduction to the basic design and implementation of a real-time operating system. Course may be repeated for credit. (F,SP)

263. Design of Programming Languages. (3) Three hours lecture and one hour discussion per week. Prerequisites: 162. Selected topics from: analysis, comparison, and design of programming languages, formal description of syntax and semantics, advanced programming techniques, structured programming, debugging, verification of programs and compilers, and proofs of correctness. (F)

264. Implementation of Programming Languages. (3) Three hours lecture, one hour discussion, and six hours programming laboratory per week. Prerequisites: 164, 263 recommended. Compiler construction. An introduction to compiler analysis. Semantics analysis code generation and optimization. Storage management. Run-time organization. (F)

"*265. Advanced Programming Language Implementation. (3) Three hours lecture per week. Prerequisites: 264. Table-driven and retargetable code generation. Register Management; Compiler design and global optimization methods. Code optimization for advanced languages and architectures. Local code improvement. Optimization by program transformation. Offered at least once every two years.


269. Software Engineering and Large System Design. (3) Two hours lecture, one hour discussion, and six hours programming laboratory per week. Prerequisites: 162 and 164 recommended, or consent of instructor. Formerly CS 287. Design and implementation of user-interfaces to computer systems. Software and hardware architectures of implemented operating systems and program- ming systems. Form-based user-interfaces. Window and display management abstractions. Case studies of naive- and expert-user interfaces. Students will complete a substantial project in one or more small projects that will explore some standard and innovative techniques. (F)

*On leave, spring
†On leave, fall
††Recipient of Distinguished Teaching Award
270. Combinatorial Algorithms and Data Structures. (3) Three hours lecture and one hour discussion per week. Prerequisites: 170. Design and analysis of efficient algorithms for combinatorial problems. Network flow theory, matching theory, matroid theory; augmenting-path algorithms; branch-and-bound algorithms; data structure techniques for efficient implementation of combinatorial algorithms; analysis of data structures and data structure techniques to sorting, searching, and geometric problems. (SP)

271. Randomness and Computation. (3) Three hours lecture per week. Prerequisites: 170 and at least one course numbered 270-279. This course is concerned with the application of probability theory to problems in computer science. Probabilistic analysis of algorithms for searching, sorting, packing, partitioning, routing, and the construction of Hamiltonian circuits, matchings, and spanning trees in graphs. Probabilistic analysis of algorithms. Probabilistic analysis of inference methods. Probabilistic construction of expander graphs and other combinatorial objects.


274. Computational Geometry. (3) Course may be repeated for credit. Three hours lecture per week. Prerequisites: 170 or equivalent. Formerly 292T. Computational problems in geometric computation: convex hulls, triangulations, Voronoi diagrams, arrangements of hyperplanes; relationships among these problems. Search problems: efficient data structures; subdivision search; various kinds of range searches. Models of computation for geometric problems. (F)


276. Number Theory and Cryptography. (2) Two hours lecture per week. Prerequisites: 170 and either Mathematics 112A or Computer Science 170. Primes, factorization, and the common divisor; efficient exponentiation mod n; efficient algorithms (some probabilistic, some deterministic, assuming the Extended Riemann Hypothesis) to decide primality and extract square roots modulo a sequence, design of protocols. (SP)

278. Machine-Based Complexity Theory. (3) Three hours lecture per week. Prerequisites: 170 or equivalent. Introduction to the mathematical foundations of computing systems upon those who use the computer for large-scale numerical computations in business, engineering, and science. (SP)

280. Computer Vision. (3) Three hours lecture per week. Prerequisites: 60B, Engineering 118 or Mathematics 128. Formerly 281. Trace the consequences of vision, 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. (SP)

281. Machine Learning. (3) Three hours lecture per week. Prerequisites: 188 or consent of instructor. Learning from the point of view of artificial intelligence with contributions from philosophy and psychology. Readings and discussion will cover concept learning, computational models of formal learning, and algorithms based generalization, reasoning by analogy, inductive learning, architectures for general learning systems, knowledge-level analysis of learning systems. A substantial project will be undertaken. (F)

282. Algebraic Algorithms. (2) Two hours lecture per week. Prerequisites: 164, Mathematics 113B, or permission of instructor. Theory and construction of symbolic algebraic computer programs. Polynomial arithmetic, GCD, factorization, integration of elementary functions, analytic approximation, simplification, design of computer systems and languages for symbolic manipulation. (SP)

283. Programming Techniques for Artificial Intelligence & Symbol Manipulation. (3) Three hours lecture per week. Prerequisites: 164, Advanced LISP programming, AI programming languages, indexing, discrimination nets, unification pattern matching, production systems, predicate-calculus based systems, frame-based systems, representations for mathematical forms, symbolic and algebraic manipulation techniques. (F)

284. Computer-Aided Geometric Design and Modeling. (3) Three hours lectures per week. Prerequisites: Mathematical skill in calculus and linear algebra. Mathematical techniques for curve and surface representation, including interpolation, approximation, splines, Bezier curves and surfaces, B-splines, Coons patches, tensor product forms, as well as subdivision end/boundary conditions, and computational considerations. (SP)

285. Procedural Generation of Geometric Objects. (3) Three hours lecture per week. Prerequisites: 184 or equivalent. Object descriptions for geometric modeling, computer graphics, and robotics. Generation of geometrical surfaces, mechanical parts, and landscape models by programs. Generalized rotational and translational sweep operations. Triangular solids and lattices in 3 and 4 dimensions. Other advanced topics and recent developments in the field. (SP)

286. Implementation of Data Base Systems. (3) Three hours lecture per week. Prerequisites: 162 and 186. Assignment of data base systems. Design and implementation on modern hardware systems. Considerations concerning operating system design, including buffering, page size, prefetching, etc. Query processing algorithms, design of data base retrieval systems and languages. Implementation of distributed data bases and data base machines. (F)

287. Advanced Robotics. (3) Three 1-hour lectures per week. Prerequisites: Electrical Engineering 125. Advanced topics related to current research in robotics. Hardware and software of real robots and robot systems taking into account: dynamic constraints, control and sensing uncertainty, and non-holonomic motion constraints. Analysis of friction for assembly and grasping tasks. Sensing systems for hands including tactile and force sensing. Environmental perception from sparse and distorted hands. Grasp planning and manipulation. (SP)

288. Artificial Intelligence Approach to Natural Language Processing. (3) Three hours of lecture per week plus programming assignment. Prerequisites: 164. Representation of conceptual structures, language theory and production systems. Syntax and memory, high-level text structures, question answering and conversation, machine translation. (F)

289. Artificial Intelligence, Knowledge Representation, and Expert Systems. (2) Two hours of lecture per week. Prerequisites: 188 or consent of instructor. Discussion of techniques for the construction of programs that can reason about their environment and perform actions appropriate to their reasoning. Emphasis on knowledge representation and expert systems, Prolog and logic programming, frame representation, languages and common sense reasoning. (F)

290. Concurrent Programming. (2) This course may be repeated for credit. Two 1-hour lectures per week. Prerequisites: 162 or consent of instructor with 164 and 263 recommended but not required. Concurrent programming languages, languages, algorithms, and supporting architectures. Reasoning about concurrent programs. Exploiting concurrency in hardware and software. Comparison of concurrent programming languages and methods. Highly parallel algorithms and notations for expressing them. Implementation techniques. Interaction of concurrent language design and hardware design. (SP)


292B. Advanced Topics in Distributed Computing Systems. (2) Course may be repeated for credit with consent of instructor. One 2-hour lecture per week. Prerequisites: 162 or equivalent with 164 and 263 recommended but not required. Build distributed computing systems, issues and techniques; communication and computation; distributed data, identification of resources and their distributed management, decentralized synchronization mechanisms, security and protection, performance and modeling of distributed systems, performance and reliability. Digital representation of print. Design, editing, representation and display of fonts. Graphics in document preparation. Page Specification Languages. Experimentation with local systems. (SP)


294. Special Topics. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. Topics will vary from semester to semester. See Computer Science Division announcements. (F,SP)

298. Group Studies Seminars, or Group Research. (1-4) Course may be repeated for credit. Lecture hour will vary with unit value. Sections 1-25: Satisfactory-grading; sections 26-35: letter graded. Advanced study in various subjects through seminars on topics to be
Endocrinology
(College of Letters and Science)

Group Office: 345 Mulford Hall, 642-2024
Acting Chair: Charles S. Nicoll, Ph.D.

Professors:
James P. Allison, Ph.D.
Roy L. Caldwell, M.D.
Marian C. Diamond, Ph.D.
James W. Fristrom, Ph.D.
Stephen E. Gluck, Ph.D.
Russell L. Jones, Ph.D.
Phyllis C. King, Ph.D.
Norman Kretchmer, M.D., Ph.D.
Paul Light, Ph.D.
Werner Loher, Ph.D.
Joe L. Martin, Ph.D.
Laudatstra Nair, Ph.D.
Charles S. Nicoll, Ph.D.
Rudolph L. Peck, Ph.D.
Jeremy Thompson, Ph.D.
Pado S. Timms, M.D., Ph.D.*
David L. Wood, Ph.D.
Irving I. Zucker, Ph.D.
Howard F. Hoffman, Ph.D. (Emeritus)
Lawson L. Rosenberg, Ph.D. (Emeritus)
Herbert H. Siegel, Ph.D.
E. L. Robert Sokstad, Ph.D. (Emeritus)

Associate Professors:
Marc Breehove, Ph.D.
Gary Freston, Ph.D.
Heiko-Ping Moore, Ph.D.

Assistant Professors:
Gregory Aponte, Ph.D.
Marc Hallersten, M.D., Ph.D.

Lecturers:
Jonas Richmond, Ph.D.

The Graduate Program

The faculty associated with the program leading to the M.A. and the Ph.D. in endocrinology have divergent interests representing endocrinology in the broadest sense: chemical mediators in the living world (autocrine, paracrine, endocrine and other hormonal factors), with approaches from molecular and cellular endocrinology through organismal and comparative endocrinology to chemical ecology.

Students who plan to work for higher degrees in endocrinology at Berkeley will be guided by a graduate adviser and by the professor who directs their research. The graduate adviser and the major professor will ascertain whether students have met the minimum requirements, will recommend to prospective candidates what additional courses to take, will decide with them the fields to be covered in the qualifying examinations, and will act generally in an advisory capacity. The candidates are expected to have completed an undergraduate major in some 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 satisfaction of the foreign language requirement and passage of an oral qualifying examination.

Energy and Resources Group

(Special Studies)

(interdisciplinary Advisory Program and Graduate Group)

Department Office: Bldg. T-4, Room 100, 642-1640
Chair: Jeffrey M. Romm, Ph.D.

Professors:
Mark N. Christensen, Ph.D. University of California at Berkeley, Environmental science
John Harte, Ph.D. University of Wisconsin. Ecology, climate, water
John P. Holdren (Vice Chair), Ph.D. Stanford University. Energy, environment, international security
Gene R. Rizhni (Adjunct), Ph.D. University of Chicago. Energy, security, political economy

*Not offered 1991-92
On leave, spring, fall
On leave, fall

Jeffrey M. Romm, Ph.D. (Forestry and Resource Management) Cornell University, Forest and wildlife policy
Jack Holland (Emeritus), Ph.D. University of California at Berkeley, Technological innovation, technology transfers

Associate Professor:
Richard Norgard, Ph.D. University of Chicago, Resources, environment, development

Lecturers:
Edward Kahn, Ph.D. University of California at Berkeley. Electric utility finance
Alan K. Meier, Ph.D. University of California at Berkeley. Energy conservation in buildings

Professors:
Edward A. Arns, Ph.D. (Architecture)
David M. Axstratler, S. N.A. (Electrical Engineering and Computer Science)
Richard Bendor, M. Arch. (Architecture)
Charles K. Bedont, Ph.D. (Electrical Engineering and Computer Science)
Richard Boudouris, LL.M. (Law)
Ellen Cairns, Ph.D. (Chemical Engineering)
Paul Craig, Ph.D. (Applied Sciences, University of California at Davis)
John P. Deyer, J.D. (Acting), (Law)
Sally K. Fontana, Ph.D. (Conservation and Resource Studies, Agricultural and Resource Economics, Landscape Architecture)

Anthony C. Fisher, Ph.D. (Agriculture and Resource Economics)
Louise P. Fortmann, Ph.D. (Forestry and Resource Management)
T. Kenneth Folio, Ph.D. (Nuclear Engineering)
David Freedman, Ph.D. (Statistics)
Wayne M. Gez, Ph.D. (Energy and Parallonomics)
Richard Gilbert, Ph.D. (Economics)
C. Roger Glassayan, Ph.D. (Industrial Engineering and Operations Research)
Edward Grene, Ph.D. (Chemical Engineering)
Lawrence Grossman, Ph.D. (Nuclear Engineering)
Ernst Haas, Ph.D. (Political Science)
Alexander J. Horne, Ph.D. (Civil Engineering)
Kenneth Jowitt, Ph.D. (Political Science)
Ernest Koenigsberg, Ph.D. (Business Administration)
Tom LaFonte, Ph.D. (Political Science)
John Letch, Ph.D. (Economics)
Alan Lichtenberg, Ph.D. (Electrical Engineering and Computer Science)
William Lidicker, Ph.D. (Ecological Biology)
Scott Lynn, Ph.D. (Chemical Engineering)
C. Barf McGuire, M.A. (Public Policy)
Noorvinder K. Mehta, D.Eng. (Civil Engineering)
Richard Meier, Ph.D. (Environmental Design, City and Regional Planning, Architecture, Landscape Architecture)
Carolyne Merchant, Ph.D. (Conservation and Resource Studies)
Laura Nadler, Ph.D. (Anthropology)
John Nelland, Ph.D. (Molecular and Cell Biology)
Linda Pacner, Ph.D. (Molecular and Cell Biology)
Arthur H. Rosenfield, Ph.D. (Physics)
Kenneth T. Roess, Ph.D. (Electrical Engineering)
Joseph Sax, J.D. (Law)
Franz Schumann, Ph.D. (History, Sociology)
Neil Smelser, Ph.D. (Sociology)
Robert Spier, Ph.D. (Biomedical and Environmental Health Sciences)
Hilgard O'Reilly Steenberg, Ph.D. (Geography)
Michael Stocks, Ph.D. (Molecular and Cell Biology)
David Teece, Ph.D. (Business Administration)
Robert H. Vanston, Ph.D. (Architecture)
M. Varan D. Yen, B. Arch. (Architecture)
Pravin Varayas, Ph.D. (Electrical Engineering and Computer Science, Economics)
Michael Watts, Ph.D. (Geography)
Michael E. Webber, M.C.P. (City and Regional Planning)
John Zysman, Ph.D. (Political Science)
John Carter, Ph.D. (Emeritus) (Business Administration)
Charles J. Hitch, M.A., LL.D. (hon.), D.Sc. (hon.) (Emeritus) (Economics)
Rudolph I. Pipa, Ph.D. (Economics)
Lynne Beninfield, Ph.D. (Psychology) (Mechanical Engineering)
Ett L. Smith, Ph.D. (Emeritus) (Electrical Engineering and Computer Science, Economics)
K.S. Speigle, Ph.D. (Mechanical Engineering)
Clyde Wahrhaftig, Ph.D. (Emeritus) (Geology and Geophysics)

Assistant Professors:
Miguel A. Altit, Ph.D. (Entomology)
Claudia Carr, Ph.D. (Conservation and Resource Studies)
William E. Dieloch, Ph.D. (Ecology and Geophysics)
Mary K. Firestone, Ph.D. (Plant and Soil Biology)
Cynthia Granger, Ph.D. (Environmental Biology)
Michael Hamann, Ph.D. (Agricultural and Resource Economics)
Robert G. Harris, Ph.D. (Business Administration)
Michael Hook, Ph.D. (Mineral Engineering)
Manuel Merila, Ph.D. (Materials Science and Mineral Engineering)
Robert M. Price, Ph.D. (Political Science)
Avital Ronell, Ph.D. (Comparative Literature)
Kenneth Train, Ph.D. (Visiting) (Economics)
Sally S. Smith, Ph.D. (Ecology)

Assistant Professors:
Catherine Kosohl, Ph.D. (Biomedical and Environmental Health Sciences)
Keith Loague, Ph.D. (Plant and Soil Biology, Forestry and Resource Management)

On leave, spring
Recalled to active service
Recipient of Distinguished Teaching Award
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, Bldg. T-4, Room 100, University of California at Berkeley; Berkeley, CA 94720; (415) 642-1640.

Upper Division Courses

100. Energy and Society. (4) Two 1-hour lectures and one 1-hour discussion per week. Energy sources, uses, and impacts: an introduction to the technology, politics, economics, and social effects of energy in contemporary society. Energy and well-being: energy in international perspective, origins, and character of energy crisis. (F) Holdren, Christensen

102. Quantitative Aspects of Global Environmental Problems. (3) Three hours lecture and one 1-hour discussion per week. Prerequisites: Physics 7C; or Physics 88 and Math 1A or 2B and Chemistry 1A, or their equivalents. Formerly Environmental Sciences 102. First and second laws of thermodynamics: efficiencies of variety of tasks. Cascading of energy flows, matching of loads and sources, and thermal storage. Concepts will be applied to space heating and cooling, transportation, industrial processes. (F) Christensen

141. Residential Energy Conservation. (3) Three 1-hour lectures and one 1-hour laboratory per week. Prerequisites: Upper division standing. Engineering, environmental, and political energy and resource conservation: building heat loss calculations, thermal comfort, life cycle costing and economic analysis of conservation potentials in appliances, house doctoring, and national and local energy conservation policies.

151. Politics of Energy and Environmental Policy. (4) Two 1-hour lectures and one 1-hour 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) Robinson

160. Critical Issues in Energy Technology. (3) Two 1-hour lectures per week. Prerequisites: Engineering 160 or equivalent. Quantitative examination of selected issues in energy technology combining analytical approaches and inputs from several disciplines. Issues selected for relevance to current policy formation. (SP) Holdren

280. Energy Economics. (3) Two 1-hour lectures 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

292A. Analytical Methods in Energy and Resources. (2) One 1-hour lecture per week. Prerequisites: Graduate course. The social science response to resource limits, 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 Western social science. The response of international assistance agencies, national governments, and nongovernmental organizations. A review of the conceptual literature with case studies from the Third World. (F) Norgaard

299. Directed Group Studies for Advanced Undergraduates. (1-4) Course may be repeated for credit. Variable. Must be taken on a pass/No Pass basis. Prerequisites: Upper division standing. Particularly courses to be specified by instructor. Group studies of selected topics. (F,SP) Staff

Graduate Courses

200. Interdisciplinary Energy Analysis. (4) Two 2-hour lectures per week. Prerequisites: 100, or equivalent and consent of instructor, and graduate standing. Graduate-level treatment of the interacting technological, economic, environmental, and sociopolitical aspects of energy supply and use, including regional, national, and international levels of systems. Assessment of alternative strategies and options from an interdisciplinary viewpoint. (F) Holdren, Christensen

202. Modeling Ecological and Meteorological Phenomena. (3) Two 1-hour lectures per week. Prerequisites: 102 or consent of instructor. Modeling methods of ecology and meteorology; analytical and numerical methods; effects of anthropogenic stress on natural systems. Also listed as IDS 202 and Soil Science 202. (F) Harte

204. Critical Issues in Energy Technology. (3) Two 1-hour lectures per week. Prerequisites: Engineering 160 or equivalent. Quantitative examination of selected issues in energy technology combining analytical approaches and inputs from several disciplines. Issues selected for relevance to current policy formation. (SP) Holdren

208. Energy Economics. (3) Two 1-hour lectures 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

215. Politics of Energy and Environmental Policy. (4) Two 1-hour lectures and one 1-hour 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) Robinson

216. Seminar in Energy, Environment, Development and Security Issues. (4) Course may be repeated for credit. One to three hours of lecture per week. Prerequisites: Upper division standing and consent of instructor. Critical, cross disciplinary analysis of specific issues or general problems of how people interact with environmental and resource systems. More than one section may be given each semester on different topics depending on faculty and student interest. (F,SP) Staff

219. Directed Group Studies for Advanced Undergraduates. (1-4) Course may be repeated for credit. Variable. Must be taken on a pass/No Pass basis. Prerequisites: Upper division standing, plus particular courses to be specified by instructor. Group studies of selected topics. (F,SP) Staff

229A. Analytical Methods in Energy and Resources. (2) One 2-hour lecture. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Quantitative methods for energy and
Engineering

(College of Engineering)

For a description of the programs in engineering, see page 76.

The following multidisciplinary courses are of interest primarily to students in the College of Engineering, regardless of their department affiliation. Most of these courses are broader in scope than those offered by a single discipline.

Lower Division Courses

**7. Introduction to FORTRAN Programming for Scientists and Engineers.** (3) See restrictions footnote. Two hours of lecture, one hour of discussion and two hours of programming laboratory per week. Prerequisites: Mathematics 1A. Formerly Computer Science 7. Introduction to computer programming, using the FORTRAN language. Variables and computation; subroutines and parameters; control structures; arrays. Productive programming techniques; style issues. Assignments and examples are drawn from numerical application, e.g., root finding, numerical differentiation and interpolation. Students will write a program over 300 lines in length. Sponsoring department: Civil Engineering. (F,SP) Taylor

**7S. Self-Paced Introduction to FORTRAN for Scientists and Engineers.** (1) Two hours of lecture plus one 3-hour laboratory on alternate weeks. Prerequisites: Physics 7A. A vectorial treatment of the principles of physics and chemistry to the engineering sciences. Work and potential energy, the principle of virtual work, stability of equilibrium. Sponsoring department: Mechanical Engineering. (SP) Staff

**29. Individual Research in Energy and Resources.** (1-4) Course may be repeated for credit. Variable. Prerequisites: Graduate standing. Investigation of problems in energy and resources from an interdisciplinary perspective. (F,SP) Staff

298. Group Studies. (2) Course may be repeated for credit. One 2-hour section per week. Must be on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Lectures, reports, and discussions on research in energy and resources. Sections are operated independently and under direction of different staff. (F,SP) Staff

299. Individual Research in Energy and Resources. (1-4) Course may be repeated for credit. Variable. Prerequisites: Graduate standing. Investigation of problems in energy and resources from an interdisciplinary perspective. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-4) Course may be repeated for credit. Individual study. Must be 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. One 2-hour seminar per week. Must be on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as a graduate student instructor in the Group and permission of the graduate advisor. Course credit for experience gained in academic teaching through employment as a graduate student instructor. (F,SP) Rommen

Interdepartmental Studies Courses

Graduate Course

IDS 235. Community Scale Energy Systems. (3) Two 11-hour lectures/discussions per week. Prerequisites: Consent of Instructor. Energy supply at the community scale through development of locally available renewable energy resources (solar, wind, biomass), Architecture, site planning and urban development, conservation and supply technologies. For students in design, planning, energy, public policy, and related fields. Term project. Sponsoring departments: Architecture, Landscape Architecture and Energy and Resources Group.

**Not offered 1991-92**

**On leave, spring, fall**

**On leave, fall**

Upper Division Courses

102. Introduction to Operations Research. (3) Two 2-hour lectures and one 2-hour discussion per week. Prerequisites: Mathematics 1B, 18. Not open to students majoring in Industrial Engineering and Operations Research. Introduction to the models and techniques of operations research as applied to engineering system problems. Linear and dynamic programming. Queues and inventory models. Examples will be drawn from various engineering disciplines to illustrate techniques, models, and optimization of engineering systems. Sponsoring department: Mechanical Engineering. (F) Staff

117. Methods of Engineering Analysis. (3) Three hours of lecture per week. Prerequisites: Mathematics 50B. Methods of theoretical engineering analysis; techniques for analyzing partial differential equations and the use of special functions related to engineering systems. Sponsoring department: Mechanical Engineering. (F) Staff

118. Introduction to Scientific Computing. (3) Three hours of lecture per week. Prerequisites: 7; Mathematics 50B, or equivalent knowledge of computer programming in FORTRAN. Application of digital computers to solution of engineering problems. Use is made of a high level language (currently FORTRAN). Linear algebraic equations, roots of nonlinear equations, quadrature, interpolation, ordinary differential equations, and error analysis. Discussion of software and mathematical software libraries. Sponsoring department: Mechanical Engineering. (F,SP) Staff


135. Applied Geophysics. (2) Two hours of lecture per week and two afternoon and one weekend field trip. Prerequisites: Geology 50, Mathematics 50A-50B, Physics 7C. Geophysical methods applied to petroleum and mineral exploration, geological engineering, geological mapping and: ground water hydrology. Seismic reflection and refraction, resistivity, magnetic, gravity, and electromagnetic surveying. Approximately three weeks and one field exercise will be devoted to each method. Sponsoring department: Materials Science and Mineral Engineering. (F,SP) Staff

147. Supplementary Work in Upper Division Engineering. (1-3) Course may be repeated for credit. Prerequisites: Limited to students who must make up a fraction of a required upper division course. May be taken only with permission of the Dean of the College of Engineering. Students with partial credit in an upper division engineering course may complete the work under this heading. (F,SP) Staff

150. Air Pollution. (3) Three hours of lecture per week. Prerequisites: Chemistry 1A; Mathematics 1B; Physics 7A. An introduction to the technology of air pollution dealing with air pollutants, effects, sources, combustion processes, control technology and abatement. Sponsoring Department: Mechanical Engineering. (SP) Staff

**Please refer to the Computer Science Service Courses section preceding the Electrical Engineering and Computer Sciences course listings.**

*On leave, spring*  
*Recipient of Distinguished Teaching Award*
151. Toxic and Hazardous Waste Management. (3) Three 1 hour lectures. Prerequisites: Mathematics 1A, 1B; Chemistry 1A. Quantitative analysis of waste generation, treatment and disposal alternatives, and environmental as well as physical and atmospheric impacts. Also included will be properties that make a waste hazardous, a brief discussion of toxicity and some background on current federal and state legislation. Sponsoring Department: Engineering and Interdisciplinary Studies. (SP) Staff

153. Introduction to Bioengineering. (4) Three hours of lecture and one hour discussion per week. Prerequisites: Chemistry 1B; Physics 7C; Mathematics 50A, Junior Standing. Basic analytical tools and applications to biological engineering problems. Biochemical and physiological fluid mechanics, biomaterials, bio-heat transfer, physiological mass transport, biological network modeling, physiological control systems. Sponsoring Department: Mechanical Engineering. (SP) Staff

160. Energy and Power. (3) Three hours of lecture per week. Prerequisites: Mathematics 50B; Physics 7C. Sources, conversion, transmission and requirements for energy in human society, concentrating on electric power. Thermodynamic principles. Fossil fuel; nuclear fission and fusion and hydroelectric power generation. Other sources: solar power; chemical and nuclear energy conversion. Ecological and social problems. Sponsoring Departments: Mechanical Engineering, Electrical Engineering and Computer Sciences, and Nuclear Engineering.

161. Solar Energy. (3) Three hours of lecture per week. Prerequisites: Physics 7B or 8B. Survey of solar energy engineering, practice and prospects. Solar geometry, collection design, water heating pools, space conditioning. Solar ponds, photo thermal and photovoltaic electricity generation. Photochemical approaches and biosolar. Sponsoring Department: Mechanical Engineering. (SP) Staff

162. Renewable Resources for Electric Power. (3) Three hours of lecture per week. Prerequisites: Physics 7B or 8B or Engineering 48 or 160 or 161. Wind, waves, tides, hydro, currents, solar and conservation technologies for expanding electric power supply. Characteristics of the electric power industry. Econometrics engineering, environmental aspects. Existing, historical, and proposed projects. Sponsoring Department: Material Science and Mineral Engineering (F) Staff.

172. Introduction to Rock Mechanics. (3) Students will receive 1 1/2 units after taking Civil Eng 172 or Mining 110. No credit if both courses have been taken. Two 1 1/2 hour lectures per week with demonstrations. Prerequisites: Mathematics 1A, 1B. Introduction to the fundamental concepts of rock mechanics. Introduction to analysis of stress and strain and its application to fracture and deformation in rocks of all kinds. Applications in mining and civil engineering involving design of underground openings in competent, layered and rock, slopes cut in jointed rock, and foundations on weak or fractured rocks. Sponsoring Dept: Civil Engineering and Materials Science and Mineral Engineering. (F) Cook, Goodman

191A. Social Implications of Technology. (3) Three 1 hour lectures per week. Prerequisites: Upper division standing in the above courses. An introduction to the social, political and ethical aspects of engineering practice and management. Students will discuss and present problems involving design and construction, as issues raised in the lectures and associated readings, and articulate their ideas in discussion. Sponsoring department: Engineering IDS. (SP)

193. California Engineer Staff. (1) Course may be repeated once for credit. One 3-hour laboratory per week. Must be taken in a pass/no pass basis. Work on the California Engineer Magazine, in one or more of the following capacities: read candidate articles, edit articles, enter articles into UNIX computer system for programming, proofread copy, read illustrations, layout issue, issue layout, paste-up, write articles on assignment, accounting, advertising sales, public relations. Sponsoring Department: Electrical Engineering and Computer Science. (F,SP) Staff

Graduate Courses

201. Ocean Engineering Seminar. (2,3) Two hours of lecture and two half hour consultation per week. Prerequisites: Enrollment in Ocean Engineering M. Eng. program or consent of instructor. Lectures on new developments in ocean, Arctic engineering and design of Arctic structures for ice structure interaction. The additional unit will require that students meet with the instructor one extra hour per week to work on an individual project. Topics covered: ice mechanics, design and implementation of local forces and other actions on structures. Term paper required. Sponsoring department: Engineering Interdisciplinary Studies. (SP) Staff

210. Introduction to X-ray Physics and Technology. (3) Two 1 1/2 hours of lectures per week. Prerequisites: Upper division or grad standing or consent of instructor. Formerly 191X. Modern developments in the field of x-rays with laboratory tubes, synchrotrons, black-body radiation, and laser-plasma sources. Concepts of coherence and partial coherence, with examples at visible wavelengths, etc. Sponsoring department: Engineering Interdisciplinary Studies. (SP) Staff


256. Numerical Methods in Fluid Mechanics. (3) Two 1 1/2 hour lectures and one hour of discussion per week. Prerequisites: 230A or Mathematics 220A or equivalent. Applications of finite difference and other numerical techniques to current problems of fluid dynamics, including high speed flow transonic flow, boundary layer and wave flows. Sponsoring Department: Mechanical Engineering.

290A. Clinical Aspects of Bioengineering. (3) One 1 hour lecture and six hours of laboratory per week. Prerequisites: Consent of instructor. This course, offered in conjunction with the Pacific Medical Center in San Francisco, is designed to introduce bioengineering students to the clinical and laboratory setting. Students analyze cardiovascular, pulmonary and ophthalmologic problems from an engineering point of view. Sponsoring Department: Mechanical Engineering.

290B. Applied Science and Technology Seminar. (1) One hour lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Physics 7A-7B-7C. Weekly seminar topics: advances in nanolithography, applications of x-ray microscopy to element-specific processes in bio systems, atomic resolution electron microscopy to study superconducting materials, methods for study of atomic arrangements and electronic properties at material interfaces, reduced risk coronary angiography, optical coatings for x-ray telescope & microscopes, two-phonon studies of chemical kinetics, coherent radiation at x-ray wavelengths. Sponsoring department: Engineering IDS. (F,SP) Staff

291A. Arctic Ocean Engineering. (1) One hour lecture per week. Characteristic features of the Arctic and Sub-Arctic environment as pertaining to the under-taking of engineering projects. Particular emphasis on ice mechanics and various ice structure interaction phenomena considered in the design of coastal and offshore facilities. Objective of the course is to acquaint students with basic understanding of various considerations affecting the design of coastal and offshore facilities in ice environments. Sponsoring department: Engineering IDS. (SP) Staff

297. Management of Large-Scale Technology Projects. (3) Two 1 1/2 hour lectures per week. Prerequisites: Graduate Standing in Engineering or Business. Very large civil and commercial product projects depend critically upon managerial and organizational factors in order to meet technical objectives. These factors and their interrelationship with technology will be explored throughout the project lifecycle. Common management principles and the role of information technology will be presented. Sponsoring Department: Engineering Interdisciplinary Studies. (SP) Staff

298A. Group Studies or Seminars. (1-6) Course may be repeated for credit. Variable. Advanced group studies or seminars in subjects which are interdisciplinary in the various fields of engineering or other sciences associated with engineering problems. Topics which form the basis of seminars announced at the beginning of each semester. (F,SP) Staff

298B. Group Studies or Seminars. (1-6) Course may be repeated for credit. Variable. Must be taken on a satisfactory/unsatisfactory basis. Advanced group studies or seminars in subjects which are interdisciplinary in the various fields of engineering or other sciences associated with engineering problems. Topics which form the basis of seminars will be announced at the beginning of each semester. (F,SP) Staff

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**Engineering–Double Major Programs**

(University of California)

Engineering Undergraduate Dean's Office: 308 McCullough Hall, 646-7894

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 both fields is required. These curricula include the core courses in each of the major 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 final quarter of the sophomore year. See 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/Materials Science and Engineering; Mechanical Engineering/Materials Science and Engineering; Materials Science and Engineering/Nuclear Engineering; Electrical Engineering and Computer Sciences/Nuclear Engineering; Mechanical Engineering/Nuclear Engineering.

In addition to the double major programs within the College of Engineering listed above, two double major curricula involving the College of Engineer-
Engineering Interdisciplinary Studies

(College of Engineering)

The Meikin Interdisciplinary Studies Center helps engineering students develop skills that go beyond their departmental program. At the undergraduate level, the center supports the technical communication component of engineering departmental courses by offering the courses Engineering 190, Technical Communication, and Interdepartmental Studies Program in Technical Communication for Nonnative Speakers of English. The center supports the college humanities and social studies requirement through the Kennedy Award Program, which is designed to encourage engineering students to select a theme for their studies outside college offerings and to take a coherent approach to their liberal arts course selection.

At the graduate level, the center supports the activities of an intercampus graduate group and several interdepartmental committees.

The intercampus graduate group administers a joint program between the San Francisco and Berkeley campuses, leading to the M.S. and Ph.D. degrees in bioengineering. For more information about the Graduate Group in Bioengineering, see the Bioengineering section of this catalog.

The interdepartmental committees are: Applied Sciences: Bioengineering, Engineering, and Business Administration; Fire Safety; Engineering Science, Hazardous Waste Management, Integrated Sensors, Nonlinear Systems and Dynamics, Ocean Engineering, Rock Mechanics, Plasmas, Robotics and Manufacturing, and Surface and Subsurface Hydrology. These committees provide a wide range of interdepartmental activities, including off-campus offerings, group studies and seminars, and public lectures and conferences.

Prospective graduate students interested in an interdepartmental committee should apply to one of the College of Engineering departments. Applicants may designate an interdepartmental committee with which they wish to be associated, so that a departmental program of study that addresses their interests can be developed.

Prospective graduate students interested in the joint San Francisco-Berkeley bioengineering degree program should apply to the Graduate Group in Bioengineering.

Additional information about the center may be obtained by writing the Meikin Interdisciplinary Studies Center, 230 Bechtel Engineering Center, College of Engineering, University of California at Berkeley; Berkeley, CA 94720.

Engineering Courses

Upper Division Courses

110. Venture Design: The Startup Company. (3) Course may be repeated for credit. One to three hours of lecture per week. Prerequisites: [details provided]. The class will nominate and select a set of specific technical products. Four-person project teams will be established by individual selection. Each team will in turn select a product and specify a management, financial, technical and marketing person. The structure of the course will be built around the 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 weekly. 190. Technical Communication. (3) Three hours of lecture per week. Prerequisites: [details provided]. 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. Sponsoring departments: Engineering Interdisciplinary Studies.

Graduate Courses

296. Operational Management of Technology. (3) Three hours of lectures per week. Prerequisites: [details provided]. The course does not assume specialist technical knowledge. Sponsoring departments: Engineering Interdisciplinary Studies.

Interdepartmental Studies Courses

Upper Division Courses

IDS 110. Introduction to Computers. (3) Students who have completed courses in Computer Science 7, 8, or 50 series will receive no credit for 110. Three hours of lecture per week. Prerequisites: Upper division standing. Students must also be enrolled in IDS 110L (with the same grading option) or an equivalent departmental course. Primarily for students in the social sciences, humanities, and professional schools other than Engineering. The conceptual foundations of computing and information technology. Structure and function of computing systems. Elements of programming. Examples are drawn mainly from word processing, database management, electronic spreadsheets, graphics and simulation, and telecommunication. Sponsoring departments: Engineering, Education, and Computer Science.

IDS 110L. Introductory Computer Laboratory. (1) Two-hour laboratories per week. Prerequisites: Upper division standing. Students must also be enrolled in IDS 110 with the same grading option as in IDS 110L. Primarily for students in the social sciences and humanities and in the professional schools other than Engineering. Elements of programming. Applications programs. Laboratory exercises are drawn mainly from computer programs.

IDS 140. Technical Communication for Non-native Speakers of English. (3) One hour of lecture and three hours of un scheduled laboratory per week. Prerequisites: [details provided]. Students under the guidance of two faculty advisors (Bus. Adm. 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. Provide an opportunity to 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.

IDS 296. Management of Innovation and Policy. (3) Two 1-hour lectures per week. Prerequisites: [details provided]. This course is designed to introduce students to the management of innovation processes. 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.

Engineering Science (College of Engineering)

The engineering science program includes closely related courses of study in mathematics, physics, and engineering. The options offered within the program prepare students for advanced graduate study in engineering, the natural sciences, or medicine.

Programs for the Bachelor's Degree

The undergraduate Engineering Science curriculum is multidisciplinary and is administered by the Engineering Science Committee. Continued enrollment and admission to upper division standing in the engineering science program require a minimum grade-point average of 3.00. 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 a 4-unit course in English composition. An additional two courses 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 a 4-unit course, in the upper division, must be taken from a single department.

Lower Division. Required (for all upper division programs in engineering science): Mathematics 1A-1B, 50A-50B, Chemistry 1A-1B; Computer Science 60A or Engineering 7; Physics 7A-7B-7C; Elementary Engineering 11A or Engineering 11B; Elementary Engineering 14A or Computer Science 40 and Engineering 45 for those in Bioengineering; English 1A or its equivalent; technical electives, 8 which must include Molecular and Cell Biology 1A.
English
(College of Letters and Science)

Undergraduate Office: 322 Wheeler Hall, 642-3467
Graduate Office: 318 Wheeler Hall, 642-4035

Professors:
J. Janet Adelman, Ph.D. Yale University. Shakespeare, English Renaissance literature

Paul J. Alpers, Ph.D. Harvard University. 16th- and 17th-century English literature

Joel Allen, Ph.D. Stanford University. English Renaissance

Ann Barfield, Ph.D. University of Wisconsin. Literary and linguistic theory, the novel

Jonas A. Brabec, Ph.D. Harvard University. Renaissance drama/comedy, prose, style, Shakespeare

Michael A. Brodsky, Ph.D. Harvard University. 19th- and 20th-century poetics, literary theory, comparative literature

Stephen Booth, Ph.D. Harvard University. Aesthetics, Renaissance literature

Mitchell R. Breitwiser, Ph.D. SUNY Buffalo. 17th-19th-century American literature

James E. Breslin, Ph.D. University of Minnesota. American poetry, modern literature, biography

Carol Chitty, Ph.D. Yale University. Victorian literature, women in literature

John S. Conley, Ph.D. Harvard University. 17th-century nondramatic literature

Friedric C. Crews, Jr., Ph.D. Princeton University. American literature, modern British literature

Philip W. Damon, Ph.D. University of California at Berkeley. Drama, modern criticism

Richard Feingold, Ph.D. Columbia University. Restoration and 18th-century literature

Donald M. Friedman, Ph.D. Harvard University. 16th and 17th-century English literature

Mary Catherine Gallagher, Ph.D. University of California at Berkeley. 19th-century British literature

Robert Hass, Ph.D. Stanford University. Poetry, poetry writing

Ronald J. Lavinsohn, Ph.D. Harvard University. Poetry, fiction, American literature

Donald A. Macdonald, Ph.D. Rutgers University. Nonfiction, American studies, American literature

Leonard Michaels, Ph.D. University of Michigan. Short fiction, writing the short story

Anna Middleton, Ph.D. Harvard University. Old and Middle English literature

D. A. Miller, Ph.D., Yale University. 19th-century English and European literature

Bharati Mukherjee, Ph.D. University of Iowa. Fiction writing, women in literature

Alan Nelson, Ph.D. University of California at Berkeley. History of drama, Medieval English literature

Brendan P. G. H. Ph.D. Columbia University. 18th-century, 19th-century, narrative

Raymond Oliver, Ph.D. Harvard University. The short poem 1200-1900; French and German poetry

Morton D. Paley, Ph.D. Columbia University. Romantic period, literature

Carolyn Porter, Ph.D. Rice University. American literature, American intellectual history

Ralph W. Rader, Ph.D. Indiana University. 18th-century and Victorian literature

Hugh M. Richardson, Ph.D. Oxford University. Renaissance literature and drama, comparative literature

Peter D. Scott, Ph.D. McGill University. Medieval European literature (especially Latin) before 1200

George A. Starr, Ph.D. Princeton University. The novel, English literature

Gardner D. Stout, Jr., Ph.D. Princeton University. Satire, British literature, modern Irish literature

John L. Traugott, Ph.D. University of California at Berkeley. Restoration and 18th-century literature

James Turner, Ph.D. Oxford University. 17th- and 18th-century literature

Alex Zaworotko, Ph.D. Princeton University. Modern British and American literature

Robert Boom, Ph.D. (Emeritus)

Richard Bridgman, Ph.D. (Emeritus)

William Erwin, Ph.D. (Emeritus)

John E. Jordan, Ph.D. (Emeritus)

Charles Muscatine, Ph.D. (Emeritus)

Thomas F. Parkeston, Ph.D. (Emeritus)

John Peterson, Ph.D. (Emeritus)

Norman Radkin, Ph.D. (Emeritus)

John H. Raisel, Ph.D. (Emeritus)

Alan Renoir, Ph.D. (Emeritus)

Wayne Shumaker, Ph.D. (Emeritus)

Emil Terwovsky, Ph.D. (Emeritus)

Associate Professors:
Elizabeth A. Abel, Ph.D. Princeton University. Modern fiction

Julie L. Assor, Ph.D. University of California at Berkeley. Renaissance, the lyric, drama

Julia Badar, Ph.D. University of California at Berkeley. Modern American literature

John M. Bishop, Ph.D. Stanford University. The novel, modern British literature

Julian C. Boyd, Ph.D. University of Michigan. English language, 17th-20th century, philosophy

Carolyn Dinshaw, Ph.D. University of California at Berkeley. Aesthetics, Renaissance literature

Bruce D. Ellington, Ph.D. University of California at Berkeley. Aesthetics, Renaissance literature

Andrew L. Griffin, Ph.D. Harvard University. Autobiography, art theory, 19th-century literature

Richard E. Hutton, Ph.D. University of Illinois. American novel, popular culture

Abdul JanMohamed, Ph.D. Brandeis University. Third World, Colonial, and African-American literature

Steven M. Knoke, Ph.D. University. Literary theory; criticism; English poetry, Milton through Romantics

Ola Kratt, Ph.D. Harvard University. Chaucer, Romance, Utopian literature

David C. Lloyd, Ph.D. Cambridge University. Criticism, Renaissance literature

William N. Nestruck, Ph.D. Harvard University. Renaissance, Italian

John D. Niles, Ph.D. University of California at Berkeley. Old and Middle English; folklore; history of English language

Susan M. Schweik, Ph.D. Yale University. Feminist theory, American (female) writers, women writers

Gary Soto, M.F.A. University of California at Irvine. Creative writing, poetry, essay, California literature

Assistant Professors:
Alfred Arasoga, Ph.D. University of California at Santa Cruz. Modern theory, poetry, Chicano literature, Shakespeare

Jenny Franich, Ph.D. University of California at Berkeley. American literature before 1865

Dorothy Hall, Ph.D. University of California at Berkeley. American literature, the novel, American studies

Steven Goldsmith, Ph.D. University of Pennsylvania. Romanic literature

Steven Justice, Ph.D. Princeton University. Late Medieval literature

Jeffrey Knapp, Ph.D. University of California at Berkeley. English language

Celeste Langan, Ph.D. University of Pennsylvania. Romantic poetry, 19th-century literature

Samuel Otar, Ph.D. University of California at Berkeley. American, 19th-century literature

Genaro Padilla, Ph.D. University of Washington. Amaranth, especially minority literature; Chicano literature, ethnic autobiography

Nancy Ruffinburg, Ph.D. Stanford University. 17th-19th-century American and Russian literature

Hertha Wing, Ph.D. University of Iowa. American, especially ethnic, literature; Native American literature

Senior Lecturers:
Thom Gunn, M.A. Cambridge University. The study and writing of poetry

Maxine Hong Kingston, F.A. University of California at Berkeley. American, Asian American

Ishmael Reed. The writing of poetry and short fiction

Lecturer:
Fenlene Shon, Ph.D. University of California at Berkeley. Modern poetry, Renaissance songs

Affiliated Faculty:
Jane Jordan (Professor of Afro-American Studies and Women's Studies)

The Department of English offers courses in literature, in language, and in writing. Our courses in literature have many different foci: major authors, intellectual and critical ideas, and the social and cultural contexts in which they were written. 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 literary history and to the work of major British and American writers, 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 analysis, and to provide continued training in critical writing. Before declaring the major, students must have completed the Reading and Composition requirement of the college. (Students are strongly urged, though not required, to take the required R&C courses in the English department: English 1 and either the "writing-intensive" form of English 6 or one of several introductory literature courses---17W, 20W, 26W, 28W, 30W, 44AW, or 44BW. A "W" course counts as one course in the major, and some of them fulfill major requirements; see below.)

In the sophomore year, students normally take English 46A-46B, Major British Writers, which provide an intensive survey of major authors from Chaucer through the twelfth century and continued practice in critical writing; and, if they continue with either half of the survey, English 15, the Introduction to Literary Study, which examines fundamental issues in literary analysis through reading, writing, and discussion of literature representing a variety of literary forms, genres, and types. The latter three courses (15, 46A, 46B), as well as a course in American literature and a course in the classical or Biblical backgrounds to English literature, define the "core" of the major, from which further upper-division study proceeds. While all five are required, three of them (English 15 and any two of the remaining four) must be taken as prerequisite to declaration.

Awareness of the historical varieties of writing in English and familiarity with a diversity of critical enterprises in literary study are fostered by the remaining specifications of the major: a course in Shakespeare; a course in literature through Romanticism (exclusive of Shakespeare and English 150); a course in critical enterprises chosen from 161 or 162 (literary theory and history of criticism), or the 170 series (interdisciplinary perspectives on literature and criticism), or the 180 series (literary genres); a course in the cultural varieties of the English language and literature; and the Upper Division Seminar, English 100, which hones the student's critical skills and learning to bear upon a single literary figure or problem, in the writing of a long essay. Beyond these categorical requirements, students are free to construct their own programs. They are encouraged to compose intellectually coherent courses of study and to pursue sustained projects of special interest, in consultation with their advisers, in the writing of a critical thesis or other major work, or in the writing of a creative work, or to design their own seminars.

Subject A. Students must have fulfilled the requirements of Subject A listing in Index.

Subject B. Students must have fulfilled the requirements of Subject B listing in Index.

Subject C. Students must have fulfilled the requirements of Subject C listing in Index.

Subject D. Students must have fulfilled the requirements of Subject D listing in Index.

Subject E. Students must have fulfilled the requirements of Subject E listing in Index.

Subject F. Students must have fulfilled the requirements of Subject F listing in Index.

Subject G. Students must have fulfilled the requirements of Subject G listing in Index.

Subject H. Students must have fulfilled the requirements of Subject H listing in Index.

Subject I. Students must have fulfilled the requirements of Subject I listing in Index.

Subject J. Students must have fulfilled the requirements of Subject J listing in Index.
Teacher Training. The Department of English offers an examination waiver for the Single Subject teaching credential in English. For further information contact the department teacher training advisor or the Student Services Office, School of Education, Tolman Hall.

Note: The semester in which a particular course will be offered and the instructor who will teach it may change after this catalog is printed. Please consult the department’s “Announcement of Classes” (available well before the beginning of each semester in the ASUC Bookstore, Textbook Department). Specific topics in the following staff courses will not be offered in Fall 1990: ENGL 39, 136, 138, 150, 156, 166, 203, and 250. Course offerings and instructors are listed each semester in the department’s “Announcement of Classes”.

Many of the courses listed below have limited enrollments.

Major Program

The English major program comprises two parts: a structure of prerequisites and an array of further specifications of electives. No fewer than 12 courses (not including 1A-1B) constitute the major; at least three of these fulfilling major requirements must be upper division courses.

Prerequisites: In order to declare the major, students must:
1. have completed the Reading and Composition requirement of the college (1A-1B; or the equivalent).
2. English 1A and 1B, or their equivalents in other departments, are not counted in the number of courses required by the major. For those, however, who complete the second half of the requirement with a "writing-intensive" section of a literature course in the English Department (see below), 17W, 20W, 26W, 27W, 28W, 30W, 44AW, 44BW, the literature component of any of these courses counts as one course toward the major.
3. have taken English 15 and any of the two upper division core requirements of the major listed below.
4. (ALL FOUR) of these core requirements must be fulfilled in order to complete the major, but only two need be taken by the time the student files the declaration of major.
5. English 46A, or one of the two upper division courses that may be offered as its equivalent, English 46B, or one of the two upper division courses that may be offered as its equivalent. (For these equivalents, see the major program description available in the department office.)
6. one course in American literature, selected from the following: English 30, 37, 130A, 130B, 130C, 130D, 131, 132, 133, 134, 136; one course in the classical or the Biblical background to English literature (English 44A is strongly recommended, but see the major program description for a list of other courses that also fulfill this requirement.)

The Major: Besides English 15 and the four additional core requirements of the major listed above, (ALL FOUR) of these core requirements must be fulfilled in order to complete the major, but only two need be taken by the time the student files the declaration of major.

Creative Writing: Five upper division courses, including two literature courses and three selected from 141, 143A, 143B, 143C, 143D, 143E, 143N, and 143T. (Note: Courses in the 143 series can be repeated for credit. Repeated courses in this series count toward the minor in creative writing. For questions regarding this minor, see Professor Elen.)

American Literature: Five upper division courses, including three selected from 130A, 130B, 130C, and 130D, and two selected from 131, 132, 135, and 136. Note: Courses not on this list but on special topics in American literature can count toward the minor with the permission of an English Department adviser.

Literature in English: Five upper division literature courses, including at least three courses before 1800, 10 units of the 140 series selected from 105A, 105B, 111, 112, 114A, 114B, 115A, 115B, 117A, 117B, 117F, 117G, 117S, 118, 119, 120, and Celtic Studies 138 and one must be selected from 121, 125A, 125B, 128, 129, 130, 131, 133, 134, 136; one course in the classical or the Biblical background to English literature (English 44A is strongly recommended, but see the major program description for a list of other courses that also fulfill this requirement.)

Courses and grade requirements: All minors in English require the completion of five upper division courses. Of these five courses, at least three must be taken at Berkeley. Four of the five courses required for the minor must be taken for a letter grade. An overall grade-point average of 2.0 is required.

Graduate Program

Students are admitted to graduate studies only in the fall semester. The GRE General Test and Subject Area Test in Literature are both required.

The Ph.D. Program. The Ph.D. program requires successful completion of 10 letter-graded courses of which at least eight will be in English and at least one will be a 250 seminar. Of the eight courses in English, seven will be distributed as follows: English 200, 202, and 203. Literature courses of an introductory nature, scholarship, normally taken in the first semester of graduate study; one course at the graduate level in each of five historical fields: Medieval literature; Renaissance literature; the Restoration and Eighteenth Century; Nineteenth- and Twentieth-Century British literature; and American literature; and one course organized in a historical or chronological coverage of English or American literature (theory, special problems, minority discourse, etc.). Students are also urged to have undertaken substantial course work in Chaucer, Shakespeare, and Milton, and study abroad will be advised to gain a solid background in foreign languages; the Department of English requires candidates for the Ph.D. to demonstrate advanced knowledge of one language or proficiency in two languages. The balance of the Ph.D. program includes fulfilling an oral qualifying examination of two to three hours and writing a dissertation. Additional details on requirements for the doctorate in English are available from the English Graduate Office, 319 Wheeler Hall.

The M.A. Program. The M.A. program in English is separate from the Ph.D. program. It welcomes a broad range of applicants, including older students from a variety of academic and cultural backgrounds. It is designed to serve students who wish to undertake intensive graduate study in the general field of English and/or American literature, or who wish to pursue a special interest that lies outside the candidates' major. A student's course of study will be determined individually at the beginning of the year with the adviser and may or may not include a short thesis or approved special project. For the master's degree often requires all or part of a second year, especially if a candidate chooses to write a thesis. However, with intense application it is possible to complete the degree in one year. The M.A. program requires the successful completion of at least 20 units (usually five courses) plus a thesis; or 24 units (usually six courses) and a general examination (written or oral), the scope of which will be determined in consultation with the adviser and the M.A. chair. Lower division undergraduate courses may not be counted toward the degree.

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 classes on a passed/not passed basis only. Students will find information on course offerings in the Announcements 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

Note: Please contact the Subject A office in 216 Dwinelle Annex (642-5570) if you wish to enroll in the following course, 1AC.

1AC. First-Year Reading and Composition. (5) Three 1/2 hour lecture and discussion meetings weekly plus individual conferences. Prerequisites: SS0-50 or SAT verbal 550 or ACT reading 20 or CEEB score 500 and Subject A Department approval. Close reading of selected expository texts, including those addressing the nature and functions of language. Formal essays and other writing exercises (min. 10,000 words) designed to promote discussion and analysis of readings. A combined course in which a grade of C or higher fulfills both the Subject A and first half of the R&C requirements. Six workload units in computation of study list. (F,SP) Staff

1A-1B. Reading and Composition. (4.4) Three 1/2 hour lecture per semester. A strong emphasis on the earlier works of the classics in Subject A (exam or course). 1A or equivalent course is prerequisite to 1B. Training in writing expository prose.

*On leave, spring
†On leave, fall
‡On leave, fall
§On leave
A. Instruction in expository writing in conjunction with reading literature.

B. Further instruction in expository writing in conjunction with reading literature. For other English courses that fulfill the second half of the Reading and Composition requirement may take place in 1B, a writing-intensive form of any of several lower division literature courses. Please see, under Courses in Literature: 17W, 20W, 28W, 26W, 27W, 28W, 30W, 44AW, and 44BW. (F,SP) Staff

Note: Students seeking to fulfill the second half of the Reading and Composition requirement are encouraged to take, in place of 1B, a workshop course offered in expository writing, and to attend writing workshops, as the instructional material devoted to writing instruction is available both in the semester on a single project, either fiction (novel) or non-fiction (biography, history, and travel literature; reading and discussion of work by established artists in the same modes.

Upper Division Courses

*141. Modes of Writing (Exposition, Fiction, Verse, Etc.). (4) May be repeated once for credit with a different instructor. Three hours of lecture per week. Prerequisites: Consent of instructor: A workshop course intended for students who have recently begun to write fiction or who have not previously taken a course in creative writing.

*143B. Introduction to the Writing of Verse. (4) Three hours of lecture per week. Prerequisites: Consent of instructor: A workshop course intended for students who have recently begun to write verse or who have not previously taken a course in creative writing. (F,SP) Read

*143D. Introduction to the Writing of Non-Fiction. (4) Three hours of lecture per week. Prerequisites: 1A-1B or equivalent and consent of instructor. A workshop course intended for students interested in the writing of prose non-fiction as an art. Writing and discussion of student work in such genres as the personal essay, biography, autobiography, history, and travel literature; reading and discussion of work by established artists in the same modes.

Lower Division Courses

*25. Language. (4) Three hours of lecture per week. The origins and symbols of human speech; pattern, change, and growth in language, with emphasis on English; interrelations of language and thought; practical implications of these issues in America today.

Upper Division Courses

*101. The English Language. (4) Three hours of lecture per week. Structure and history of the English language.

*102. Problems in English Linguistics. (4) May be repeated for credit with permission of the instructor. Three hours of lecture per week. Topics vary from year to year, but will consider synchronic and diachronic linguistics and their application to the study of literature.

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


15. Introduction to Literary Study. (4) Three hours of lecture and discussion per week. Designed for prospective English majors. Reading in a variety of literary texts and types as introduction to critical thought and writing about literature. Taught in limited-enrollment sections; readings vary from section to section. (F,SP) Staff

17. Shakespeare. (4) Three hours of lecture per week. Lectures on Shakespeare and reading of his best works.

17W. Shakespeare. (4) Open only to students who have not yet completed the second half of the Reading and Composition requirement. Three hours of lecture plus two additional one-hour section meetings per week. Prerequisites: 1A or equivalent. Course syllabus varies from year to year. Students whose major is not English, but majors and prospective majors are welcome.

27. Introduction to the Study of Drama. (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 Fiction. (6) Open only to students who have not yet completed the second half of the Reading and Composition requirement. Three hours of lecture plus two additional one-hour section meetings per week. Prerequisites: 1A or equivalent. Course syllabus varies from year to year. Students whose major is not English, but majors and prospective majors are welcome.

28. Introduction to the Study of Fiction. (6) Open only to students who have not yet completed the second half of the Reading and Composition requirement. Three hours of lecture plus two additional one-hour section meetings per week. Prerequisites: 1A or equivalent. Course syllabus varies from year to year. Students whose major is not English, but majors and prospective majors are welcome.

27. Introduction to the Study of Drama. (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 Fiction. (6) Open only to students who have not yet completed the second half of the Reading and Composition requirement. Three hours of lecture plus two additional one-hour section meetings per week. Prerequisites: 1A or equivalent. Course syllabus varies from year to year. Students whose major is not English, but majors and prospective majors are welcome.

30. American Literature. (4) Three hours of lecture per week. An introductory survey of American literature. (F) Wong

30W. American Literature. (6) Open only to students who have not yet completed the second half of the Reading and Composition requirement. Three hours of lecture plus two additional one-hour section meetings per week. Prerequisites: 1A or equivalent. Course syllabus varies from year to year. Students whose major is not English, but majors and prospective majors are welcome.

37. Special Topics in American Literature. (4) Three hours of letter per week. Prerequisite: Consent of instructor. Topics vary from semester to semester. Students should consult the department's "Announcement of Classes" for offerings before the beginning of the semester. (SP) Staff

39. Freshmen Seminar. (4) May be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Consent of instructor. Topics vary from semester to semester. Students should consult...
the department's "Announcement of Classes" for current offerings 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. (F) Justice (F)

44AW-44BW. Masterpieces of Literature. (6;6) Open only to students who have not yet completed the second half of the Reading and Composition requirement. Three hours of lecture plus two additional one-hour section meetings per week. Prerequisites: 1A or equivalent. Course syllabus and format identical to 44A-44B above, with two additional one-hour section meetings per week devoted to writing instruction and additional writing assignments. Fulfills second half of Reading and Composition requirement. (F) Justin

46A-46B. Major British Writers. (4;4) Three hours of lecture or seminar per week. Prerequisites: 1A-1B. Discussion of typical works of major authors from Chaucer through the twentieth century with consideration of the more important aspects of English literary history. A. Chaucer through Milton. B. The 18th through the 20th centuries. (F,SP) Staff

*80K. Children's Literature. (4) Three hours of lecture per week. The study of selected works written for children.

57. Other Voices: Multi-Cultural 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. Prerequisites: Reading & Composition 1A & 1B. This course will introduce students to the literary study currently being undertaken by English 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. (SP) Staff

Upper Division Courses

*105A-105B. Introduction to Early English Poetry. (4;4) Three hours of lecture per week.

A. Lyrics and religious poems. B. The Epic. (F,SP) Coolidge, Anson

107. The English Bible as Literature. (4) Three hours of lecture per week. Introduction to the English Bible treated as a literary work. (F,SP) Coolidge, Anson

110A-110B. Medieval Literature. (4;4) Three hours of lecture per week.

A. Development of literary form and idiom throughout the Christian West from the first to the fifteenth century.
B. Close study of selected classics in translation, including Chaucer, Dante, and the Divine Comedy. (SP) Scott

111. Chaucer. (4) Three hours of lecture per week. Lectures on and discussion of Chaucer's major works. (F) Justice

112. Middle English Literature. (4) Three hours of lecture per week. Middle English literature exclusive of Chaucer studied in the original language. (F) Niles

*114A-114B. English Drama. (4;4) Three hours of lecture per week.

A. English drama to 1603. B. English drama from 1603 to 1700. A: Nelson; B: Coolidge

115A-115B. The English Renaissance. (4;4) Three hours of lecture per week.

A. Beginnings of the English Renaissance, and literature of the 16th century. B. Literature of the 17th century. (F) Altman

*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;4) Three hours of lecture per week. A chronology 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.

*117F. Shakespeare and Film. (4) Three hours of lecture per week. Close study of the texts and films based on 8 to 10 plays. Lectures will emphasize the critical implications of transposing plays to film. The goal of the course is the critical understanding of Shakespeare, and the course satisfies the departmental requirement of a course on Shakespeare in the major.

117J. Shakespeare. (4) Three hours of lecture per week. Prerequisites: Consent of Instructor. Studies of selected plays, with practice in various critical approaches, e.g., establishing text, relation to source, changing concepts of comedy and tragedy, influence of theatrical conditions on technique. (F,SP) Altman, Stout, Dinshaw

117S. Shakespeare. (4) Three hours of lecture per week. Lectures on Shakespeare and reading of his best works. (F,SP) Greenblatt, Knapp, Booth

*117T. Shakespeare in the Theatre. (4) Three hours of lecture per week. Prerequisites: Offered in conjunction with or as a sequel to 117S or 117A-117B. The interrelation of Elizabethan plays and stage practices. Classroom exercises, written assignments, and a final examination.

118. Milton. (4) Three hours of lecture per week. Lectures on and discussion of Milton's major works. (SP) Tunor

119. The Augustan Age. (4) Three hours of lecture per week. Lectures on and discussion of Dryden, Swift, Pope, and some of their contemporaries. (F) Feingold

*120. The Age of Johnson. (4) Three hours of lecture per week. Lectures on and discussion of later eighteenth-century British literature.

121. Romantic Period. (4) Three hours of lecture per week. Lectures on the Romantic period. British, French, German, and contemporaries. (F,SP) Langan

*122. Victorian Period. (4) Three hours of lecture per week. Literature of the Victorian period with an emphasis on poetry and nonfictional prose.

124. The English Lyric. (4) Three hours of lecture per week. The development of the English tradition of style and structure in lyric poetry. (F) Oliver

125A-125B. The English Novel. (4;4) Three hours of lecture per week.

A. Defoe through Scott. B. Dickens through Conrad. (F,SP) A: Starr (F); B: Gallagher (SP)

125C. The European Novel. (4) Three hours of lecture per week. Lectures on and discussion of major European novels. (F) Bernstein

125D. The 20th-Century Novel. (4) Three hours of lecture per week. Lectures on and discussion of major novels of the twentieth century. (SP) Bernstein


127. Modern Poetry. (4) Three hours of lecture per week. British and American poetry: 1900 to the present. (F) Hays

*128. Modern Drama. (4) Three hours of lecture per week. British and American drama: 1860 to the present.

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall

130A. American Literature: Before 1800. (4) Three hours of lecture per week. Lectures on and discussion of the major writers of the early American period. (F) Otter

130B. American Renaissance. (4) Three hours of lecture per week. Lectures on and discussion of the major texts of the American Renaissance. (SP) Otter

130C. American Literature: 1865-1900. (4) Three hours of lecture per week. Lectures on and discussion of American literature from the Civil War through 1900. (SP) Franchot

130D. American Literature: 1900-1945. (4) Three hours of lecture per week. A survey of modern American literature. (F) Porter

131. American Poetry. (4) Three hours of lecture per week. A survey of American poetry and its background from prehistoric times until the present. The special emphasis of the course will be historical, with particular attention to such poets as Bradstreet, Taylor, Frenau, Bryant, Emerson, Longfellow, Poe, Whitman, Dickinson, Frost, Pound, Eliot, and Stevens. (SP) Hase


*133. Black Writers in America. (4) Three hours of lecture per week. Black writers in the American cultural context.

*134. Contemporary Literature. (4) Three hours of lecture per week. Lectures on and discussion of selected works of literature written since the Second World War.

136. American Studies. (4) May be repeated for credit with a different topic and permission of the instructor. Three hours of lecture per week. An examination of various aspects of the modern literature written in English in Africa, the Caribbean, India, and Southeast Asia. Topics will vary from semester to semester. Students should consult the department's "Announcement of Classes" for current offerings before the start of the semester. (F,SP) Franchot, McQuade

*138. Studies in Third World Literature in English. (4) Course may be repeated for credit with a different topic and consent of instructor. Three hours of lecture per week. A survey of major American writers. Intensive study of a special topic or critical problem in literary study. Topics vary from semester to semester. Students should consult the department's "Announcement of Classes" for current offerings before the start of the semester. (F,SP) Padilla

150. Upper-Division Seminar. (4) Course may be repeated for credit with consent of instructor. Three hours of seminar per week. Prerequisites: Consent of instructor. A course in the period or type of literature to be continued in the seminar, or comparable background in a related discipline relevant to its topic, is strongly recommended. Formerly 151. Designed primarily for English majors. Intensive study of a special period or topic or critical problem. Topics vary from semester to semester. Students should consult the department's "Announcement of Classes" for offerings before the beginning of the semester. (F,SP) Staff

152. Women Writers. (4) Course may be repeated for credit with consent of instructor. Three hours of seminar per week. Prerequisites: Consent of instructor. A course in the period or type of literature to be continued in the seminar, or comparable background in a related discipline relevant to its topic, is strongly recommended. Formerly 151. Designed primarily for English majors. Intensive study of a special period or topic or critical problem. Topics vary from semester to semester. Students should consult the department's "Announcement of Classes" for offerings before the beginning of the semester. (F,SP) Staff

153. Women Writers. (4) Course may be repeated for credit with consent of instructor. Three hours of seminar per week. Prerequisites: Consent of instructor. A course in the period or type of literature to be continued in the seminar, or comparable background in a related discipline relevant to its topic, is strongly recommended. Formerly 151. Designed primarily for English majors. Intensive study of a special period or topic or critical problem. Topics vary from semester to semester. Students should consult the department's "Announcement of Classes" for offerings before the beginning of the semester. (F,SP) Staff

*On leave, spring
*Recalled to active service
†Recipient of Distinguished Teaching Award
160. Methods and Materials of Literary Criticism. (4) Three hours of seminar per week. An introduction to issues in literary criticism with emphasis on application of principles and methods to selected literary texts.

161. Introduction to Literary Theory. (4) Three hours of lecture per week. This class will focus on literary theory. (F,SP) Bantfield

162. History of Literary Criticism. (4) Three hours of lecture per week. Readings in major texts of literary analysis and criticism from Plato and Aristotle to the twentieth century. Emphasis on the main aesthetic canon, interpretive premises, and philosophical projects within which literature has been debated and evaluated in several critical traditions.

165. Special Topics. (4) May be repeated for credit on a different topic. Three hours of seminar per week. Prerequisites: Consent of instructor. Designed primarily for English majors. Topics vary from semester to semester. Students should consult the department's "Announcement of Classes" for offerings before the beginning of the semester.

166. Special Topics. (4) May be repeated for credit on a 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 before the beginning of the semester. (SP) Kingston

170. Literature and the Arts. (4) May be repeated for credit with a different topic and permission of the instructor. Three hours of lecture per week. Studies in the relationship of English literature to the arts. (SP) Griffin

171. Literature and Sexual Identity. (4) May be repeated for credit with a different topic and permission of the instructor. Three hours of lecture per week. A study of the functions of the definition of sexual identity in literature in relation to literature, literary convention, psychology, and the particular politics and sociology of individual cultures. The course may range broadly over Western literature or concentrate on one historical period.

172. Literature and Psychology. (4) May be repeated for credit with a different topic and permission of the instructor. Three hours of lecture per week. Studies in the relationship of English literature to psychology.

173. The Language and Literature of Films. (4) May be repeated for credit with permission of the instructor. Three hours of lecture per week plus film viewing. Studies in the language of film. Emphasis on film narrative, filmic techniques and the "language" of film. Lectures, class discussions, and film viewings. (SP) Hutson, Nestrick

174. Literature and History. (4) May be repeated for credit with a different topic and permission of the instructor. Three hours of lecture per week. Topics will vary from semester to semester. (SP) Paley

176. Literature and Popular Culture. (4) May be repeated for credit with a different topic and permission of the instructor. Three hours of lecture per week. Topics will vary from semester to semester. (F) Hutson

177. Literature and Philosophy. (4) May be repeated for credit with a different topic and permission of the instructor. Three hours of lecture per week. Studies in the relationship of English literature to philosophy. (F) Bantfield

178. British and American Folklore. (4) Three hours of lecture per week. Study of representative forms of folklore and oral literature among the English-speaking people of the British Isles and North America.

180A. Autobiography. (4) Three hours of lecture per week. Lecture on and discussion of autobiographical forms. (F) Padilla

180C. Comedy. (4) Three hours of lecture per week. Studies of representative comic forms, techniques, and points of view.

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. (SP) Scott

180H. Short Story. (4) Three hours of lecture per week. Lectures on and discussion of the form of the short story. Topics may vary from semester to semester; focus may be historical or restricted to a particular period (e.g., medieval, modern). (SP) Kratins

180S. Satire. (4) Three hours of lecture per week. Study of representative satire forms, techniques, and points of view. (F) Friedman

1802. Science Fiction. (4) Three hours of lecture per week. A survey of science fiction which includes both short stories and novels. The focus will be on the analysis of the texts and on the history and theory of the genre.

193. Computers in the Humanities: Literary Applications. (4) This course may not be counted as one of those required for the major or as a breadth requirement for a student in the sciences. Three hours of lecture per week. Prerequisites: Consent of instructor. An introduction to the use of computers in the study of literature, including analysis of texts, concordances, and bibliographic techniques. The course will include sufficient instruction in a programming language to enable students to program text manipulations. In addition to readings, students will be required to arrange training time on the computer for an average of three hours per week. No previous knowledge of computers is assumed.

Professional Courses

310. Field Studies in Tutoring Writing. (1-3) May be repeated for a maximum of six units. Two to four hours of supervised tutoring in Student Learning Center and one 2-hour seminar per week. Must be taken on a passed/not passed basis. Prerequisites: Pre-enrollment interviews required. Tutoring Berkeley undergraduates in Subject A, 1A, 1B, and other Writing and/or Literature courses. Students will serve as readers and discuss the writing process, re-reading their students' writing, learning the writing process. Tutoring Berkeley undergraduates in Subject A, 1A, 1B, and other Writing and/or Literature courses. Tutoring Berkeley undergraduates in Subject A, 1A, 1B, and other Writing and/or Literature courses.

319A. Honors Seminar: Great Books of English and American Literature. (4) Three hours of lecture per week. Prerequisites: Normally open only to senior students with a GPA of 3.5 or better. Consent of instructor. Intensive study of major works, for example: Canterbury Tales, King Lear, Hamlet, Paradise Lost, Gulliver's Travels, Pride and Prejudice, Bleak House, Ulysses, Leaves of Grass, Scarlet Letter, Moby Dick. Not limited to English majors. (F) Feingold

319B. Senior Seminar: Special Topics. (4) Three hours of lecture per week. Prerequisites: Normally open only to senior students with a GPA of 3.5 or better. Consent of instructor. Intensive study of major works, for example: Canterbury Tales, King Lear, Hamlet, Paradise Lost, Gulliver's Travels, Pride and Prejudice, Bleak House, Ulysses, Leaves of Grass, Scarlet Letter, Moby Dick. Not limited to English majors. (F) Feingold

319C. 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 is restricted by university regulations. Group study in a field that shall not coincide with that of any regular course and shall be specific enough to enable students to write essays based upon their studies. (F,SP) Staff

319D. Supervised Independent Study for Advanced Undergraduates. (1-4) 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. Enrollment is restricted by university regulations. Group study in a field that shall not coincide with that of any regular course and shall be specific enough to enable students to write essays based upon their studies. (F,SP) Staff

Teachers' Courses

301. Problems in the Teaching of Language. (3) Seminar. Students will serve as readers and discussion section leaders in an undergraduate lecture course, and must have completed satisfactorily a seminar, present, or equivalent course in the area of student-centered course structure. The topics will be one of the following general areas: 1) Critical and Methodological Problems in the Study of Literature; Sample topics: Comedy, Stylistic Genres, Modes of Literary Analysis; Psychoanalytic Criticism, Dramatic Literature and Problems in Staging; Literature and Sociology; Literature and Politics. 2) Literary Modes and Eras. Sample topics: Politics and Literature in 18th-Century England, The Social Context of the British Novel of the 1840s; Women in Literature

302. The Teaching of Composition and Literature. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture and 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 hands-on sample essays. Enrolled as Graduate Student Instructors in the English 1A-1B Program or the English 46 series, the course will include class visitation.

303. The Teaching of Composition. (3) Three hours of lecture per week. A course designed for experienced Associates in the Department of English, based on the instructional model developed by the Bay Area Writing Project.

397. Community College English Programs: Principles and Practice. (3) Two hours of lecture and two hours of supervised classroom practice per week. Prerequisites: Completion of 3/4 of work in the graduate English program. Designed to acquaint students with typical community college English programs and to afford them the opportunity to participate, plan, and assist in community college English classes, especially at the remedial level of freshman writing classes.
Graduate Courses

For admission to some seminars, special competence in a foreign language may be required at the instructor's discretion.

200. Problems in the Study of Literature. (4) Three hours of lecture per week. Approaches to literary study, including textual analysis, scholarly methodology and bibliography, critical theory and practice. (F) Brehm, Osung, Tumer

*201A. The English Language. (4) Three hours of lecture per week. Structure of English. The structure of present-day English: pronunciation, grammar, vocabulary, dialects.


*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 to advanced undergraduates, with the consent of the instructor. Graduate lecture courses surveying broad areas and periods of literary history, and admitting students in wide reading. Offerings vary from year to year. Students should consult the department's "Announcement of Classes" for offerings before the beginning of the semester. (F,SP) Staff

205A-205B. Old English. (4;4) Three hours of lecture per week. Prerequisites: Open to undergraduates with the consent of the instructor. (F) Mills

206. Celtic Studies. (4) Course may be repeated for credit. Three hours of lecture per week.

207A. Readings in Medieval Latin. (4) Course may be repeated for credit with the consent of the instructor. Three hours of lecture per week. Prerequisites: Latin 2 or equivalent. An introduction to the central language and literature of the Middle Ages.

207B. Readings in Renaissance Latin. (4) Three hours of lecture per week. Readings of selected works 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. (F) Adelman

*218. Milton. (4) Three hours of lecture per week. Discussion of Milton's major works.

*220. Theory of Composition. (4) Three hours of lecture per week. Prerequisites: Current or prior experience in the teaching of composition or consent of instructor. Readings in composition theory combined with consideration of practical applications.

243A. Fiction Writing Workshop. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Enrollment in Ph.D. program in English; consent of instructor, normally based on prior writing submitted. A writing workshop in poetry for graduate students. (F) Hass

246. Graduate Pro-Seminars. (4) Three hours of lecture per week. Pro-seminars in the major chronological fields of American literature providing graduate instruction in scholarly and critical approaches appropriate to each field. (F,SP) Staff

*246C. Graduate Pro-Seminars. (4) C-D. Renaissance (excluding, or at least not prominently featuring, Shakespeare)

*246D. Graduate Pro-Seminars. (4) Prerequisites: 246C.

*246E. Graduate Pro-Seminars. (4) Prerequisites: 246C.

*246F. Graduate Pro-Seminars. (4) Prerequisites: 246E.

*246G. Graduate Pro-Seminars. (4) G-H. Romantic and Victorian

*246H. Graduate Pro-Seminars. (4) Prerequisites: 246G.

*246I. Graduate Pro-Seminars. (4) I-J. American Literature. Modern British Literature will be covered in 203.

*246J. Graduate Pro-Seminars. (4) Prerequisites: 246I.

*246K. Graduate Pro-Seminars. (4) Prerequisites: 246J.

250. Research Seminars. (4) Course may be repeated for credit. Independent. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. (F,SP) Staff

251. Colloquium for Students in the English M.A. Program. (4) One 3-hour meeting per week. Prerequisites: Open only to students in the M.A. Program. Qualified students should consult their advisers and the department's "Announcement of Classes" for offerings before the beginning of the semester. (F) Arteaga, Loewinsohn

297. Independent Study for Graduate Students in English. (1-12) Course may be repeated for credit. Independent. Normally reserved for students directly engaged upon the doctoral dissertation. (F,SP) Staff

299. Special Study. (1-8) Course may be repeated for credit. Independent. Normally reserved for students directly engaged upon the doctoral dissertation. (F,SP) Staff

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall

Entomological Sciences

Entomological Sciences (College of Natural Resources)

Department Office: 218 Wellman Hall, 642-6660
Chair: Rudolph L. Pipa, Ph.D.

Professors:
- John R. Anderson, Ph.D. University of Wisconsin, Madison. Medical entomology, acarology
- Legoodo C. Caligianone, Ph.D. University of California at Berkeley. Biological control
- John E. Casale, Ph.D. University of Wisconsin, Madison. Insecticide chemistry and spraying
- Donald L. Dahlin, Ph.D. University of California at Berkeley. Forest entomology, biological control
- Howard V. Dally, Ph.D. University of Kansas. Systematic entomology
- John T. Doyan, Ph.D. University of California at Berkeley. Systematic entomology
- Louis A. Falcon, Ph.D. University of California at Berkeley. Insect pathology
- Gordon W. Franklin, Ph.D. University of California at Berkeley. Urban entomology
- Wayne M. Gctt, Ph.D. University of Wisconsin, Madison. Insecticide chemistry and spraying
- Andrew L. Jones, Ph.D. University of California at Berkeley. Systems ecology, biological control
- Marjorie A. Hoy, Ph.D. University of California at Berkeley. Systematic entomology
- Robert S. Lane, Ph.D. University of California at Berkeley. Parasitology, tick biology
- Werner J. Loefer, Ph.D. Imperial College, London. Insect behavior
- George F. Oster, Ph.D. Columbia University. Mathematical ecology
- Rudolph L. Pipa, Ph.D. University of Minnesota. Insect anatomy
- Jerry L. Powell, Ph.D. University of California at Berkeley. Systematic entomology
- Alexander H. Purcell, Ph.D. University of California, Davis (Vice Chair). Insect vectors of plant pathogens
- Vincent H. Nesh, Ph.D. University of Louisville. Aquatic entomology
- Loy E. Volkman, Ph.D. University of Washington. Insect physiology
- David L. Wood, Ph.D. University of California at Berkeley. Systematic entomology
- Richard L. Doutt, Ph.D. University of California at Berkeley. Biological control (Emeritus)
- Deane F. Furman, Ph.D. University of California at Davis and Berkeley. Medical entomology, acarology (Emeritus)
- Kenneth S. Hagen, Ph.D. University of California at Berkeley. Biological control, insect nutrition (Emeritus)
- William M. Haskins, Ph.D. University of California at Berkeley. Insect toxicology (Emeritus)
- Carl B. Hufnaker, Ph.D. Ohio State University. Biological control (Emeritus)
- E. Gorton Linsley, Ph.D. University of California at Berkeley. Systematic entomology (Emeritus)
- Abraham E. Michelbacher, Ph.D. University of California at Berkeley. Agricultural entomology (Emeritus)
- Woodrow W. Middickauff, Ph.D. Cornell University. Agricultural entomology (Emeritus)
- Edward I. Schlegel, Ph.D. University of California at Davis. Systematic entomology (Emeritus)
- Ray F. Smith, Ph.D. University of California at Berkeley. Agricultural pest management (Emeritus)
- Edward B. Sylvester, Ph.D. University of California at Berkeley. Vector entomology (Emeritus)
- Yoshinori Tanada, Ph.D. University of California at Berkeley. Insect pathology (Emeritus)
- William E. Waters, Ph.D. Yale University. Forest entomology (Emeritus)
- Clarence J. Weinmann, Ph.D. University of California at Berkeley. Entomology (Emeritus)

Associate Professors:
- Miguel A. Altiere, Ph.D. University of Florida. Biological control
- L. D. Akin, Ph.D. Osaka City University, Japan. Natural products chemistry
- Mark A. Tanouye, Ph.D. Yale University. Insect neurophysiology (Acting)

Assistant Professors:
- Nicholas J. Mills, Ph.D. University of East Anglia, Norwich. Biological control
- Stephen C. Well, Ph.D. University of California, Riverside. Agriculture entomology

Lecturers:
- William W. Allen, Ph.D. University of California at Berkeley. Medical entomology
- Reginald H. Dadd, Ph.D. Imperial College, University of London. Insect physiology, mosquito
- Richard Garcia, Ph.D. University of California at Berkeley. Biological control, mosquitoes
- Thomas E. Miller, Ph.D. University of Cambridge, England. Insect physiology, nutrition
- George G. Poinar, Jr., Ph.D. Cornell University. Entomology

On leave, spring
Recalled to active service
Recipient of Distinguished Teaching Award
The Department of Entomological Sciences presents a diversified and highly interdisciplinary teaching and research program. This includes the following areas of emphasis:
entation, and conservation of natural enemies. (F) Caitagirone, Mills

153. Medical and Veterinary Entomology. (4) Three 1-hour lectures, and one 1-hour pest management discussion per week. A study of the role of insect and other arthropods in the transmission and causation of diseases in humans and domestic animals, including the geographical areas and types of ecosystems inhabited by various species and the structural/behavioral adaptations associated with parasitism. Pest management/discussion sessions focus on how aspects of the biology and behavior of vector and pest species influence the types of strategies used in control management programs. (SP) Anderson, Lane

154. Agricultural Acarology. (2) Two 1-hour lectures and/or discussions per week. Prerequisites: An introductory biology course. An introduction to the biology, ecology, morphology, physiology, genetics, and classification of acarines. Specialized acarines and methods to evaluate, monitor, and control pest mites will be surveyed and compared, including host plant resistance, cultural, chemical, and biological controls. Hoy

166. Vector-Pathogen Relationships. (2-4) This course may be taken for a 1-hour laboratory per week. Laboratory identification of the major arthropod vectors of disease agents to humans and other animals, and study of the structure of adaptations associated with free-living and parasitic stages and with blood feeding. (SP) Anderson, Lane

186. Field Studies in Entomology. (1-3) Course may be repeated for credit. One unit for three hours of work per week. Must be taken on a pass/none pass basis. Prerequisites: Consent of instructor. Laboratory experiences in off-campus organizations relevant to specific aspects of entomology. Regular individual meetings with faculty sponsor and written reports required. (F,SP) Staff

197. Directed Group Studies for Advanced Undergraduates. (1-3) Course may be repeated for credit. One unit for three hours of work per week. Must be taken on a pass/none pass basis. Prerequisites: Consent of instructor. Study or research on topics that may vary from semester to semester. (F,SP) Staff

198. Supervised Independent Study and Research. (1-12) Course may be repeated for credit. One unit for three hours of work per week. Must be taken on a pass/none pass basis. Prerequisites: Consent of instructor. Student or research on topics that may vary from semester to semester. (F,SP) Staff

Graduate Courses

200. Entomology Staff Seminar. No credit. One 1-hour seminar per week. Weekly meetings for the presentation of theses, masters' and doctoral examinations, and graduate students. Attendance by all graduate students is recommended. (F,SP) Staff

204. Principles of Systematic Entomology. (2) Course may be repeated for credit. Two 1-hour lectures and discussion per week. Prerequisites: 104. Theory and practice of systematic entomology with emphasis on phenetic and phylogenetic approaches to classification, biogeography, and nomenclature. (F) Daly, Doyen, Powell

205. Insect Population Ecology. (2) Two 1-hour lectures per week. Prerequisites: 105, Math 16a-16b or consent of instructor. Population dynamics, regulation, and Ed mensur, theory of natural control. Emphasis on models in population ecology relevant to insect population ecology and integrated pest management. (F) Gutierrez

210. Principles and Problems in Agricultural Entomology. (3) Three 1-hour lectures per week. Prerequisites: 100 or 110. The principles of insect control; the side effects to plants and animals following insecticide usage; plot design and sampling techniques; legislative controls in agricultural entomology. Weilert

214. Advanced Forest Entomology. (2) Two 1-hour lectures and guided discussions per week and two 3-hour field trips. Prerequisites: 100 or Forestry 106 or consent of instructor. Concepts and practices in forest entomology and the research from which they are derived. Dahlsten, Wood

230. Biology of Parasitoids. (3) One hour of lecture and 6 hours of laboratory per week. Prerequisites: 130 or consent of instructor: The ecology, behavior, and developmental biology of parasitoids (protean parasites). Emphasis is on laboratory and field analysis of host-parasitoid relationships and the evolution of these relationships in a wide range of taxonomic groups. Caitagirone

250. Plant Arthropod Interactions. (3) Two 1 1/2 hour lectures/discussions per week. Prerequisites: Consent of instructor. Behavioral ecology and physiology of phytophagous Arthropods, particularly insects. Impact of plant chemistry on behavior and physiology of insects, biophysics and micrometeorology in relation to arthropods on plants, adaptive morphology and physiology of arthropods and types of selective pressures involved, crop plant resistance to pests and aspects of plant variability. (F) Hoy

254. Field Course in Medical Entomology-Parasitology. (1) Prerequisites: 150 and/or 153, or consent of instructor. Two weekend field trips: a 1-hour meeting at 8:00 a.m. and a 1-hour laboratory will follow each field trip. Techniques used for collecting blood sucking arthropods and trapping selected vertebrate hosts; methods of processing specimens for study; the organs and identification of specimens. To be offered in odd-numbered years. (SP) Anderson, Lane

255. Insect Molecular Genetics. (2) Course may be repeated for credit. One hour lecture and one hour discussion per week. Prerequisites: 100 and Introductory Genetics course. Introduction to molecular genetics, terminology, and techniques of molecular genetics in relation to insects. Topics include DNA structure, function and regulation, transformation of insects, and applications of the technology to the management of arthropod pests. (F) Hoy

272. Principles and Methods of Entomological Research. (3) Three 1-hour lectures per week. Techniques and purposes of the scientific method in entomology, with emphasis on problem selection and the collection, evaluation, and presentation of data. Recommended for beginning graduate students. (F) Staff

274. Presentation and Publication of Entomological Research. (2) One 3-hour 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) Staff

285. Seminar in Insect Physiology. (1) Course may be repeated for credit. One 3-hour seminar per week. A 3-hour seminar held once a week for graduate students to discuss the advances in insect physiology through individually prepared papers by students. (SP) Staff

288. Seminar in Parasitology. (1) Course may be repeated for credit. One 3-hour seminar per week. A 3-hour seminar held once a week for graduate students to discuss the advances in entomology/parasitology through individual presentations prepared by students. (SP) Anderson, Lane

292. Seminar in Insect Bio-Organochemistry. (1) Course may be repeated for credit. One 3-hour seminar per week. A 3-hour seminar held once a week for graduate students to discuss the advances in insect bio-organic chemistry through individually prepared papers by students. (SP) Kubo

293. Seminar in Insect Pathology. (1) Course may be repeated for credit. One 3-hour seminar per week. A 3-hour seminar held once a week for graduate students to discuss the advances in invertebrate pathology through individually prepared papers by students. (F,SP) Falcon, Polinar

294. Seminar in Systematic Entomology. (1) Course may be repeated for credit. One 3-hour seminar per week. A 3-hour seminar held once a week for graduate students to discuss the advances in systematic entomology through individually prepared papers by students. (F) Staff

295. Seminar in Insect Ecology and Biological Control. (1) Course may be repeated for credit. One 3-hour seminar per week. A 3-hour seminar held once a week for graduate students to discuss the advances in insect ecology and biological control through individually prepared papers by students. (F) Staff

300. Research in Entomology and Parasitology. (1-12) Course may be repeated for credit. Four hours of work per unit per week on part of student. Original investigation of special topics in laboratory, field, and museum. Credit awarded according to work accomplished. (F,SP) Staff

601. Individual Study for Master's Students. (1-8) Course may be repeated for credit. Four hours of work per unit per week on part of student. Original investigation of special topics in laboratory, field, and museum. Credit awarded according to work accomplished. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Four hours of work per unit per week on part of student. Original investigation of special topics in laboratory, field, and museum. Credit awarded according to work accomplished. (F,SP) Staff

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall

(Recipiept of Distinguished Teaching Award)
Environmental Sciences

(College of Letters and Science)

Group Major Office: Division of Undergraduate and Interdisciplinary Studies, 301 Campbell Hall, 642-2628

Instructor: Doris Sloan.

Head Adviser: Mark Christensen
Major Advisers: Area I, Physical Science: Mark Christensen, William B.N. Berry; Area II, Biological Science: William Lidicker; Area III, Social Science: James Anderson, Orman Granger.

Group Major in Environmental Sciences

A student may elect to follow one of three distinct areas in the group major in environmental sciences: physical science, biological science, or social science. Details of course requirements appear below. Each program emphasizes broad and comprehensive training in the fundamentals of mathematics, physics, chemistry, and biology, and in those areas of social science only related to environmental questions. Such training is indispensable for those who wish to acquire more than a superficial understanding of the impact of science and technology on society, and who wish to contribute to the solution of environmental problems.

Although many environmental issues have an urban focus, this field encompasses rural as well as urban problems. It is concerned with the interaction of urban people with the physical and biological environment created by cities but stops short of the problems stemming from the interaction of people with other people in cities; such matters must be left to the fields of urban and ethnic studies.

The senior seminar, Environmental Sciences 196A-196B, is an important feature of the group major in environmental sciences. Typically, a group of 25 or fewer seniors, including students from each of the three areas, works intensively under faculty guidance for two semesters on a specific environmental problem.

The group major program is administered through the Division of Undergraduate and Interdisciplinary Studies. Students are referred to this office for all administrative matters, and this is where major students file their ACE Schedule Request Forms.

Major Requirements

Because of the continual addition of new courses and the demise of others, in exceptional cases advisors may consider the substitution of certain other courses for those officially listed under the three major options.

Environmental Design

(College of Environmental Design)

Upper Division Courses

*IDS 122. Animal Behavior. (3) Three hours of lecture, one hour demonstration, plus one hour discussion per week. Prerequisites: Consent of instructor.

IDS 191A. Introduction to Laboratory Animal Science and Resources. (2) One 1-hour lecture and one 2 1/2-hour laboratory per week. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor. An introductory course in the basic principles of research and the use of laboratory animals. Lectures and discussion will cover the ethical, legal, and biological aspects of research using laboratory animals. (SP)

IDS 221. Ecology and Epidemiology of Arthropod-Borne Zoonoses. (2) Sponsoring departments: BEHS and Entomology Sciences. One 2-hour lecture per week. Prerequisites: Consent of instructor. An introductory course in the basic principles of research and the use of laboratory animals. Lectures and discussion will cover the ethical, legal, and biological aspects of research using laboratory animals. (SP)

Upper Division Courses

*101. Writing About Environmental Design. (3) Course may be repeated for credit. Three 1-hour lecture per week. Prerequisites: Consent of instructor. An intensive workshop for students interested in writing about architecture, landscape, and the built environment. Different forms of expression—poetry, fiction, nonfiction—will be considered. (SP)

*118. Introduction to Design. (4) Two 1 1/2-hour lectures, two 3-hour studios, and one 1-hour seminar per week. Prerequisites: Consent of instructor. An intensive course on design concepts and conventions of graphic representation and model building as related to the study of architecture and landscape architecture. The focus of this studio will be on architecting and design of both the built environment and the built environment. The emphasis will be on the study of the built environment and the built environment. (SP)

Environmental Design

(Office of Environmental Design)

Undergraduate Office: 234 Wurster Hall, 642-8632

For a description of the programs in the College of Environmental Design, see page 77.

The college faculty has established several courses and a core 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 have been integrated 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 101, 111, 113, 135, 138, 169A, 169B, contact the Department of Architecture.

Lower Division Courses

1. Introduction to Environmental Design. (3) Two 1½-hour lectures, one 2-hour discussion/studio per week. Introductory survey course. Environmental awareness and environmental design. Berkeley campus used for case study. (F)

2. People and Environment. (3) Two 1½-hour lectures; one 1-hour discussion per week. Survey of relationships between people and environments, design, and the study of architecture and landscapes and to introduction to their literature. (SP)

11A. Introduction to Drawing. (4) Two 1½-hour lectures and two 3-hour studios per week. Prerequisites: Consent of instructor. An intensive course on design concepts and conventions of graphic representation and model building as related to the study of architecture and landscape architecture. The focus of this studio will be on architecting and design of both the built environment and the built environment. The emphasis will be on the study of the built environment and the built environment. (SP)

Upper Division Courses

*11B. Introduction to Design. (4) Two 1½-hour lectures, two 3-hour studios, and one 1-hour seminar per week. Prerequisites: Consent of instructor. An intensive course on design concepts and conventions of graphic representation and model building as related to the study of architecture and landscape architecture. The focus of this studio will be on architecting and design of both the built environment and the built environment. The emphasis will be on the study of the built environment and the built environment. (SP)

*71. History of the Environment. (3) Three 1-hour lectures per week; four 8-hour field trips. Study of development and change in the natural and constructed environment of California, colonial times to present. (SP)

Upper Division Courses

*101. Writing About Environmental Design. (3) Course may be repeated for credit. Three 1-hour lecture per week. Prerequisites: Consent of instructor. An intensive workshop for students interested in writing about architecture, landscape, and the built environment. Different forms of expression—poetry, fiction, nonfiction—will be considered. (SP)

*118. Introduction to Design. (4) Two 1 1/2-hour lectures, two 3-hour studios, and one 1-hour seminar per week. Prerequisites: Consent of instructor. An intensive course on design concepts and conventions of graphic representation and model building as related to the study of architecture and landscape architecture. The focus of this studio will be on architecting and design of both the built environment and the built environment. The emphasis will be on the study of the built environment and the built environment. (SP)

Environmental Sciences

(College of Letters and Science)

Group Major Office: Division of Undergraduate and Interdisciplinary Studies, 301 Campbell Hall, 642-2628

Instructor: Doris Sloan.

Head Adviser: Mark Christensen
Major Advisers: Area I, Physical Science: Mark Christensen, William B.N. Berry; Area II, Biological Science: William Lidicker; Area III, Social Science: James Anderson, Orman Granger.
Major Requirements for All Three Areas of Environmental Sciences

Lower Division Courses. Biology 11 plus Integrative Biology 105 or 153A or Forestry 170; or Biology 1A-1B
Chemistry 1A-1B or 4A-4B
Chemistry 8A or 112A (for biological and physical science areas only)
Computer Science 3 or Engineering 7 or Interdepartmental Studies 110
Environmental Science 10
Mathematics 1A-1B or Mathematics 16A-16B (for biological and social science areas only)

Upper Division Courses. Energy and Resources 102
Geography 130 or Anthropology 148

Statistics 131A
Economics 100A or 101A or Political Economy of Natural Resources 100 (for social science area only)

Environmental Sciences 125
Environmental Sciences 196A-196B

Additional Upper Division Courses. A total of 30 upper division units is required in the major, including the upper division courses listed above. The remaining units are drawn from environmental science-related courses in departments of the College of Letters and Science and selected courses in professional schools and colleges.

Area I (Physical) Physical sciences departments

Area II (Biological) Biological sciences departments

Area III (Social) Social sciences departments

Lists of upper division courses recommended for each of the three areas are available in 301 Campbell Hall, or call 642-2828.

Lower Division Courses

10. Introduction to Environmental Science. (3) Three hours of lecture and one hour of discussion per week plus one 8-hour field trip per semester. A survey of biological and physical environmental problems, focusing on geologic hazards, water and air quality, water supplies, solid waste, introduced and endangered species, preservation of wetland ecosystems, interaction of technical, social, and political approaches to environmental management. Emphasizing Bay Area problems. (F) Sloan

Upper Division Courses

125. Environments of the San Francisco Bay Area. (3) Three hours of lecture per week with field trips. The weather and climate, plants and animals, geology, landforms and soils of the Bay Area, with an emphasis on interaction of these physical components, their modification by humans, and problems deriving from human use. Environmental Science majors should take this course in the sophomore or junior year. (SP) Sloan

196A-196B, Senior Seminar in Environmental Sciences, (3;3) Three hours of seminar per week, field trips, community contacts, individual research tutorials. Prerequisites: Senior standing in the E.S. major and 12 units of research. Each student prepares a well-documented research report giving detailed attention to a specific, current environmental problem in the Bay Area. (F,SP) Sloan

198. Directed Group Study. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Regulations set by College of Letters & 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: Enrollment is restricted by regulations listed in the General Catalog. (F,SP) Staff

Ethnic Studies

(Special Studies or College of Letters and Science)

Department Office: 3407 Dwinelle Hall, 642-6555
Chair: Ling-chi Wang, M.A.

Professors:
Marino Barrera, Ph.D. (Chicano Studies)
Evelyn N. Glenn, Ph.D. (Asian American Studies/Women's Studies)

Associate Professors:
Carlos Munoz, Jr., Ph.D. (Chicano Studies)
M. Ling-chi Wang, M.A. (Chicano Studies)

Assistant Professors:
Beatriz Manz, Ph.D. (Chicano Studies/Geography)
Alex M. Saragoza, Ph.D. (Chicano Studies)

Lecturer:
LaVerne Ding (Asian American Studies)

Undergraduate Major Advisers: Mr. Wang, Ms. Mogino.

Choice of Program

A student can complete the group major in ethnic studies in the College of Letters and Science or in the Department of Ethnic Studies with each an A.B. degree. Students in each program are subject to the requirements of the respective college or department.

The Group Major in Ethnic Studies

The group major in ethnic studies provides a core curriculum designed to develop a comparative and multidisciplinary understanding of the experiences and communities of Afro-Americans, Asian Americans, Chicanos, and Native Americans.

Students majoring in ethnic studies study the history, culture, politics, and sociology of Third World communities in the United States within the general context of American society and institutions.

Thus, they pursue knowledge vital for a critical understanding of contemporary society and for social changes to improve the lives and communities of racial minorities. Ethnic studies majors also prepare for graduate study in either academic or professional fields.

The student majoring in ethnic studies works closely with an academic adviser and selects an area of emphasis—social sciences, humanities, community studies, or special area.

Breadth Requirements—Special Studies

(For College of Letters and Science breadth requirements, see the college announcement.)

1. Demonstrated proficiency in reading and composition, one year at college level.
2. Demonstrated competence in a language other than English. This may be fulfilled by two semesters of college-level courses or three years of high school courses in a given language.
3. Completion of a course in mathematics, statistics, logic, or computer science.
4. Completion of a course in one of the natural sciences.
5. Completion of six courses outside the student's declared area of emphasis.

Major Requirements

Lower Division. 1. Ethnic Studies 102.
2. Completion of a course in the history of Western Civilization or American history, or an equivalent course. A list of equivalent courses may be obtained from the adviser.
3. Completion of an introductory course in one of the four ethnic studies programs (including Afro-American studies).

Upper Division. 1. Completion of three core courses in ethnic studies: 130, 141, and 195.
2. Completion of two additional courses in ethnic studies.
3. Completion of six additional courses which form the basis of the declared area of emphasis. Two of the courses must be taken in two different ethnic studies programs (including Afro-American studies).

Honors. The Department of Ethnic Studies provides a program leading to the A.B. degree with honors. Students will be 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 adviser for the group major. Honors students will be required to complete Ethnic Studies 110, Senior Honors Seminar for Ethnic Studies Majors. In order to graduate with an A.B. degree with honors, students must obtain at least a 3.3 GPA for all course work undertaken at the University.

The Minor

Requirements:
1. History: Ethnic Studies 130.
2. Electives: Two courses in ethnic studies.
3. Electives: Two courses in Native American studies, Chicano studies, Asian American studies, or Afro-American studies.

Lower Division Courses

20. Introduction to Ethnic Studies. (4) Two 1½-hour lectures per week. The University, its relationship to complex structures, legislative bodies, community people, and specifically Third World people will be analyzed. The University's values will be critically examined. The history of Ethnic Studies programs in this country and their development and struggles will be discussed. (F) Wang

21. A Comparative Survey of Third World Experiences in the United States. (3) Three 1-hour lectures and one 1-hour discussion per week. A comparative analysis of the four racial minority groups—Afro-Americans, Chicano, Asian Americans, and Native Americans—within the United States focusing on social, cultural, economic, and political aspects of their historical experience. (F) Staff

30. Third World Cultural Patterns. (3) Two 1½-hour lectures per week. A comparative analysis of Third World groups and cultures in America, with emphasis on patterns of thought, differences in strategy, and cognitive maps used by various groups in responding to common pan-cultural life situations. (F,SP)

*On leave, spring
†Recipient of Distinguished Teaching Award
190. Advanced Seminar in Third World Studies. (1-4) Course may be repeated for credit. Two 1-hour lectures per week. Prerequisites: Consent of instructor. Advanced seminar in Third World studies with topics to be announced at the beginning of each semester. (F,SP) Staff

195. Selected Issues in Third World Research. (4) Course may be repeated with different topics. Two 1-hour seminars per week. Prerequisites: Consent of instructor. Seminar on issues related to Third World experiences and communities in the United States. Students will examine theories of society and do research on topics from different methodological perspectives. Issues will vary from semester to semester. (F) Staff

H196. Senior Honors Seminar for Ethnic Studies Majors. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Seminar designed to help students prepare for and guide the writing of a senior thesis. (F,SP) Staff

197. Field Work in Third World Communities. (1-3) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Supervised field work. Regular individual meetings with faculty sponsor and written reports required. (F,SP) Staff

198. Supervised Group Study. (1-3) Course may be repeated for credit. Must be taken on a passed/not passed basis. Consents of instructor and consent of instructor. Group discussion, research, and reporting on a topic. (F,SP) Staff

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and 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

Ethnic Studies Graduate Group (Special Studies)

Group Office: 3407 DeNouvella Hall, 642-6434

Graduate Chair: Tung-chi Wang, M.A.

Professors:
- Mario Barrera, Ph.D. (Chicano Studies)
- Gerald Barber, Ph.D. (Anthropology)
- Robert Blumen, Ph.D. (Sociology)
- Barbara Christian, Ph.D. (Afro-American Studies)
- Roy Duster, Ph.D. (Sociology)
- Reginald Jones, Ph.D. (Afro-American Studies)
- Elaine H. Kim, Ph.D. (Asian American Studies)
- Lawrence Levine, Ph.D. (History)
- Leon Jaworski, Ph.D. (History)
- Waido E. Martin, Jr., Ph.D. (History)
- Evelyn Nakano-Glen, Ph.D. (Asian American Studies)
- Richard Ogin, Ph.D. (Political Science)
- Charles Sellars, Ph.D. (History)
- William Simmons, Ph.D. (Anthropology)
- Richard Sutch, Ph.D. (Economics)
- Ronald Takaki, Ph.D. (Asian American Studies)
- Gerald Vizenor (Native American Studies)
- Margaret Wilkinson, Ph.D. (Afro-American Studies)
- Otis Willyon, Ph.D. (Music)

Associate Professors:
- W. V. Clark, Ph.D. (Afro-American Studies)
- James Kettner, Ph.D. (History)
- Clara Sue Kedwell, Ph.D. (Native American Studies)
- Charles Henry, Ph.D. (Afro-American Studies)
- Percy Hinzlner, Ph.D. (Afro-American Studies)
- Michel Laguerre, Ph.D. (Afro-American Studies)
- David C. Lloyd, Ph.D. (English)
- Beatrice Martinez, Ph.D. (Chicano Studies)
- Margaret B. Melville, Ph.D. (Chicano Studies)
- Carlos M. Muñoz, Jr., Ph.D. (Chicano Studies)
- Carolyn Porter, Ph.D. (English)
- Michael Reich, Ph.D. (Economics)
- Alex M. Saragosa, Ph.D. (Chicano Studies)
- Gary A. Soto, M.F.A. (Chicano Studies)
- Paul Thomas, Ph.D. (Political Science)
- Robert Walker, Ph.D. (Geography)
- L. Ling-chi Wang, M.A. (Asian American Studies)
- Tenoch Cervantes, Ph.D. (Native American Studies)
- Abdul Jammohamed, Ph.D. (English)

Assistant Professors:
- Norma Alarcón, Ph.D. (Chicano Studies)
- Amanda Y. Cabaza, Ph.D. (Asian American Studies)
- Julia Curry, Ph.D. (Chicano Studies)
- Tory Snowarow Fauzett, J.D. (Native American Studies)
- Siv polar, Ph.D. (Chicano Studies)
- Sau-lung C. Wong, Ph.D. (Asian American Studies)

Graduate Adviser: Ms. Melville.

The ethnic studies graduate program is designed to provide a comprehensive study of the historical, cultural, and societal implications of ethnic diversity in the United States. The program aims to develop a critical understanding of the experiences and contributions of American ethnic groups, with a particular focus on African-Americans, Chicano-Americans, and Native American peoples.

The curriculum is designed to provide a broad range of courses that explore the historical, political, social, and cultural dynamics of ethnic groups in the United States. Courses cover topics such as race and ethnicity, immigration, social justice, and cultural identities. Students are encouraged to engage with diverse perspectives and critical methodologies to develop a nuanced understanding of ethnic diversity.

Overall, the program seeks to empower students with the knowledge and skills to critically analyze and engage with the complex issues of ethnic diversity in contemporary society.
Students may obtain information regarding the requirements and curriculum from the graduate secretary of the Ethnic Studies Graduate Group.

Graduate Courses

200A. Major Issues in Ethnic Studies Scholarship: U.S. (4) One 4-hour seminar per week. Study of major issues of Ethnic Studies scholarship. Focus will be on theories of race and class in American society as they relate to Afro-Americans, Asian Americans, Chicano, and Native Americans. A term paper utilizing a comparative approach required. (F) Takaki

200B. Major Issues in Ethnic Studies Scholarship: World Context. (4) One 4-hour seminar per week. Prerequisite: 200A or consent of instructor. Study of the major issues of Ethnic Studies Scholarship focusing on other countries such as South Africa, Brazil, and Cuba. Emphasis will be on cross-national comparative analysis to understand race and class within a world context. A major essay required. (SP) Barrera

250. Research Seminar: Selected Issues and Topics. (4) Course may be repeated for credit. One 4-hour seminar per week. Prerequisites: 200A-200B or consent of instructor. A seminar course designed to involve Ethnic Studies students directly in the research process. Emphasis on examination and analysis of primary sources, methodology, and the development of theoretical constructs. A major research paper is required. (F,SP) Staff

296. Directed Dissertation Research. (4-12) May be repeated for credit. A major research seminar. Must be taken on a satisfactory/unsatisfactory basis. For qualified students directly working on the doctoral dissertation. (F,SP) Staff

299. Directed Reading: Major Racial Minorities in the United States. (2-4) May be repeated for credit with different topic. Individual instruction. A term paper required.
A. Major works in Afro-American Studies.
B. Major works in Asian American Studies.
C. Major works in Chicano Studies.
D. Major works in Native American Studies.
E. Special Topics. (F,SP) Staff

601. Individual Study for Master's Students. (4) May be repeated once for credit. Individual instruction. Must be taken on a satisfactory/unsatisfactory basis. In consultation with Group faculty, to prepare students for master’s examinations. (F,SP) Staff

602. Individual Study for Doctoral Students. (2-8) May be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 200A-200B. Individual study, in consultation with Group faculty, to prepare students for the doctoral oral examinations. A student will be permitted to accumulate a maximum of 16 units in 601 and 602, respectively, toward examination preparation. Units earned in these courses may not be used to meet academic residence or unit requirements for the master’s degree or doctoral degree. (F,SP) Staff

Professional Courses

301. Professional Training: Teaching. (4) Course may be repeated for credit. Two 1-hour classes and one 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as a Teaching Assistant. To develop teaching skills, especially in undergraduate courses. (F,SP) Staff

Film

(College of Letters and Science)

Group Major Office: Division of Undergraduate and Interdisciplinary Studies, 301 Campbell Hall, 642-6884

Advisory Committee: William Nestrick, Head Adviser (English and Comparative Literature), Bernard Augst (French and Comparative Literature), Seymour Chatman (Rhetoric), Carol J. Clover (Scandinavian and Comparative Literature), Richard Hutson (English), Anton Kees (German), Gavriel Moses (Italian).

Group Major in Film

The group major in film is administered by Undergraduate Interdisciplinary Studies. It has been designed to place the history and theory of film in the larger context of humanistic studies.

To declare the film major: Film 25A (or Comparative Literature 25A) must be completed. In addition, the student must be progressing in the chosen language.

Lower Division

History of Film: Two courses, one on film from its beginnings, covering the silent period and the conversion to sound (to 1930) [Film 25A, Comparative Literature 25A], and the other on the classical period through the New Wave and the emergence of the postwar avant-garde [Film 25B, Comparative Literature 25B].

Documentary Film: Film 28A.

Avant-Garde Film: Film 28B.

Language Requirement: In addition to the language used for the entrance to the University, students will choose a second language. The choice of a language to be made so that, between the entrance requirement and the second language, both groups of the following language are represented:

Group One: French, German, Italian, Japanese, Russian, or Swedish.
Group Two: Czech, French, German, Polish, Portuguese, Serbo-Croatian, or Spanish.

Other languages such as Arabic, Hebrew, Korean, Mandarin, and Tagalog may be substituted for one of these groups when taken in conjunction with course work (e.g., independent study) in the relevant films in that language.

The student is to attain the level of three semesters in one language and two semesters in the other language. (Three years of a language in high school with minimum grades of C equals two semesters of a language in college. For further information see the Announcement of the College of Letters and Science.) Courses taken to fulfill the language requirement for the major may be taken passed/not passed, but if they are also fulfilling the major requirement the last semester must be taken for a letter grade.

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, English 173, Rhetoric 129).

Auteur: One course on an individual auteur (e.g., Film 151, Italian 170, Scandinavian 189).

Genre: One course on film genre (e.g., Film 108, English 176).

Film Electives: (Approximately 18 units) required to complete major requirements of 30 upper division units (e.g., Afro-American Studies 142A, Film Electives: (Approximately 18 units) required to complete major requirements of 30 upper division units (e.g., Afro-American Studies 142A, Film 130, English 130, Asian American Studies 130). The class or 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 is as follows: Honors—3.50 GPA, High Honors—3.67 GPA, and Highest Honors—3.84 GPA. Students in the honors program are to take Film 195 for a letter grade to complete a senior honors thesis. Although the production of a film may be part of the preparation of the thesis and the film submitted as a documentation or example, it is expected that the thesis will be a substantial piece of writing on film criticism or film history.

Lower Division Courses

25A. The History of Film. (4) Three hours lecture and three to four hours laboratory per week. From the beginnings through the conversion to sound. In addition, 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,SP) Fabe

25B. The History of Film. (4) Three hours lecture and three to four hours laboratory per week. Prerequisites: 25A or equivalent. The sound era through 1971. Staff

28A. The Documentary Film. (3) Three hours of lecture and one hour of laboratory per week. Prerequisites: 25A or equivalent. An analysis of the development of the documentary film, including examples by Flaherty, Eisenstein, Riefenstahl, and others. (SP) Fabe

28B. The Avant-Garde Film. (3) Three hours of lecture and one hour of laboratory per week. Prerequisites: 25A or equivalent. A survey of experimental film, including examples by Vigo, Dziga Lewi, Bunuel, Clair, Dreyer, Brakhage, Kubelka, Snow, Gehr, Frampston, and Rainer. (F) Staff

Upper Division Courses

100. History of Film Theory. (4) Three hours lecture and three to four hours laboratory per week. Prerequisites: 25A or equivalent. An analysis of the development of film theory, from an historical perspective, of major theorists of film. (F)

108. Special Topics in Film Genre. (4) Course may be repeated for credit. Three hours lecture and one to three hours film laboratory per week. The study of film by "kind". Focus on a particular genre such as the documentary, western, the animated film, film noir, the musical. (SP) Staff

151. Auteur Theory. (4) Course may be repeated for credit. Three hours lecture and three to four hours film laboratory per week. Prerequisites: 100 or equivalent. The works of a single director. (F)

H195. Film Honors Thesis. (4) Independent study with a faculty. Prerequisites: Successful completion of a 3.5 GPA in all University work and a 3.5 GPA in courses in the major. Students in the honors program are to take H195 for a letter grade to complete a senior honors thesis. Although the production of a film may be part of the preparation of the thesis and the film submitted as a documentation or example, it is expected that the thesis will be a substantial piece of writing on film criticism or film history. (SP) Nestrick

197A. Field Study at the Pacific Film Archive. (2) Three hours of field work and one hour of group meetings per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor - Film majors only. Formerly 197. Students will learn about film bibliography and research materials. Interns will get a thorough orientation to the PFA library through introductory lectures and training sessions. Then, for 3 hours per week, they will help organize materials for inclusion in fieldwork files. Interns will gain experience in library organization and film bibliography, as well as a broad knowledge of the kinds of film reviews and criticism found in a variety of sources. (F) Staff

197B. Field Studies for Majors. (3) Course may be repeated for credit. Individual conferences with Faculty advisor. Students meet at least three hours per week at field study. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor - Film majors only. Formerly 197. 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 as a member of the faculty on the Film Advisory Committee. Faculty sponsor and student will establish individual meeting times and academic requirements for acceptable completion of the course. Commitment to at least 8 hours of field work per week.

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. 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 allow students to write an essay based upon the study. (F,SP) Staff

199. Supervised Individual Study for Advanced Undergraduates. (1-4) To be arranged. Must be taken on a passed/not passed basis. Prerequisites: 25A or equivalent and consent of instructor. 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 his/her study. (F,SP) Staff

Folklore
(College of Letters and Science)

Program Office: 201 Kroeber Hall, 642-2092
Chair: Alan Dundes, Ph.D.

Professors:
Stanley Brandes, Ph.D. (Anthropology)
James Deetz, Ph.D. (Anthropology)
Alan Dundes, Ph.D. (Anthropology)
John F. Lind, Ph.D. (Culture) (scandinavian)
Michael N. Nagler, Ph.D. (Classics)
Bonnie Wade, Ph.D. (Music)

Associate Professors:
Daniel F. Mella, Ph.D. (Anthropology)
John D. Niles, Ph.D. (English)

The Folklore Program

This 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. 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 folklore may be a specialization in 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, folklore or primitive art. As an introduction to the discipline, students must take Anthropology 160, 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 another 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. (4,4) Two hours of seminar per week (plus seven hours of outside class). An interdisciplinary consideration of divergent topics related to folklore and research in folklore. (F,SP) Dundes

286. The Folktales and Allied Forms. (4) One 2-hour meeting per week. The study of folk narrative, including motif and type classifications, theories of myth and folklore, and methods of analyzing prose narrative. (F)

298. Readings in Folklore. (3-6) Course may be repeated for credit. Individual conferences to be arranged. (F,SP)

299. Directed Research. (3-6) May be repeated for credit. Individual conferences to be arranged. (F,SP)

Forest Products
(College of Natural Resources)

Department Office: 145 Mulford Hall, 642-9456; or call 478 Richmond Field Station, 231-4956

Undergraduate Adviser: Mr. Quairles.

The Major

The major in forest products is designed for students interested in the wise utilization of the many products obtained from trees and in obtaining an education embracing the broad field of renewable natural resources. Emphasis is placed on technical properties of the material to maximize benefits from the harvested tree. Courses provide a basic understanding of wood and its uses, the interactions with forest management and the importance of effective utilization in the management and conservation of forests. Students may select elective courses that are relevant to their individual interests and career objectives.

Career areas for men and women with a B.S. degree in Forest Products include supervision of production, planning of processing methods and facilities, and quality control; research and development of products and processes; and marketing, sales, and technical services. Students who desire careers in research or teaching may also prepare themselves for graduate studies leading to the M.S. or Ph.D. degrees with specialization in areas such as wood chemistry, wood physics, forest products pathology, wood anatomy, and pulp and paper chemistry. During their freshman and sophomore years, students are expected to complete the following: biology, 3 units; chemistry, 11 units; calculus, 6 units; physics, 3 units; statistics, 3 units; English, 6 units; economics, 5 units; and approximately one-half of 18 units of restricted electives in social sciences or humanities. Students in their junior or senior years must complete selected courses in forest products and forestry, the remainder of the restricted elective requirement, and sufficient elective courses to satisfy total unit requirements.

The Minor

Any undergraduate enrolled in a major which is related to or would be enhanced by formal study in forest products may declare a minor in forest products, subject to approval by the graduate adviser in forest products. The requirements for the minor are as follows: A minimum of five courses, three of which must be upper division, in forest products. All of the five courses must be taken for a letter grade unless the course is offered only on a passed/not passed basis. At least a C (2.0) average will be required in all courses taken in satisfaction of the minor. The course of study for the minor must be approved by the undergraduate adviser in forest products.

Graduate Program

Graduate work in forest products may be undertaken through the Wood Science and Technology program. For a description of the program, see the Wood Science and Technology section of this catalog.

Lower Division Courses

10. Wood As a Renewable Natural Resource. (3) Three 1-hour lectures per week. Surveys the role of wood as a renewable, nonrenewable resource in meeting the needs of society for shelter and consumer products. Comparative review of renewable and nonrenewable resource systems, and properties and uses of wood relative to ecological and environmental considerations. (SP)

Upper Division Courses

131. Laboratory in Wood Identification. (2) One 3-hour laboratory and 3 hours reading per week. Prerequisites: Forestry 121 (may be taken concurrently). The use of gross and minute characteristics of wood for identification. (F) Dodd

132. Physical Properties of Wood. (3) Two 1-hour lectures plus one 3-hour laboratory per week. Prerequisites: 131; eight units of Physics. Formerly WST 132. Study of the deterioration of woods by insects and microorganisms. (SP) Hairsine

133. Mechanics of Wood. (3) Two 1-hour lectures plus one 3-hour laboratory per week. Prerequisites: 131, 132, 156, 157. Students from other departments need consent of instructor. Formerly WST 134. Strength and stiffness of wood and structural lumber, factors affecting strength; derivation of working stresses, structural derivatives of wood and wood composites. (SP) Schniewind

134. Chemistry of Wood and Bark. (3) One 2-hour lecture plus one 3-hour laboratory per week. Prerequisites: Three units of organic chemistry; upper division students from other departments need consent of instructor. Formerly WST 138. Chemical nature of wood and bark and the analysis and important reactions of their constituents, including cellulose, hemicelluloses, lignin, and associated materials. (F) Zavarin

135. Biological Deterioration of Wood. (2) One 2-hour lecture per week. Prerequisites: Consent of instructor. Formerly WST 137. Study of the deterioration of wood in use by fungi, bacteria, and insects, and its control or prevention. (SP) Wilcox

141. Mechanical Processing of Wood. (2) Two 1-hour lectures per week. Formerly WST 132. The theory of converting logs into sawn, peeled, or other machine produced products. (F,SP) Beall

142. Bonding Processes for Wood. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: Consent of Instructor. Formerly WST 137. Principles of bonding, survey of wood adhesives and bonded wood products. The manufacture, quality control, testing, and the uses (performance) of particleboard and other glued products, including furniture. Plant visits. (SP) Beall
143. Chemical Processing of Wood. (3) Two 1-hour lectures plus one 3-hour laboratory per week. Prerequisites: 154 or consent of instructor. Formerly WST 153. The technology and associated chemistry of processing wood and its derivatives, including: pulping, pulp bleaching, papermaking, hydrolysis to sugars and lignin, pyrolysis to organic products, gasification to syngas, and related chemical conversions of wood. Energy and environmental aspects will be considered. (SP) Zavarin

190. Performance of Wood in Structures. (3) Three 1-hour lectures per week. A survey of wood properties and wood products of importance to building design and construction. Case studies dealing with proper use of wood in structures to avoid deterioration failures. (Currently offered as Architecture 159, Section 2, Fall semester). (SP)

198. Directed Group Study. (1-3) May be repeated for credit. Meetings to be arranged. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor. Formerly WST 198. Group study of special problems in forest products. (F,SP) Staff

Graduate Courses

231. Wood Formation and Structure. (3) Two 1-hour lectures and one 3-hour discussion per week. Prerequisites: 131 or equivalent, or consent of instructor. Wood formation and structure, including histotactic activity in primary growth of woody plants and initiation of secondary cambium. Developmental studies of cambium, and regulation through hormonal action. Formation of microfibrils in cell walls. (F) Dodd

232. Advanced Wood Physics. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 132 or equivalent. Formerly Forestry 232. Absorption of water, nonaqueous liquids, adsorption 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 modes of heat transfer important in wood processing and usage. (F) Quarles

233. Advanced Wood Mechanics. (3) Three 1-hour lectures per week. Prerequisites: 133. Formerly Forestry 233. Deformation and fracture of wood, mechanics of the cell wall and current topics from the literature. (SP) Schniewind

234. Chemistry of Polysaccharides, Lignin, and Extractives. (3) Three 1-hour lectures per week. Prerequisites: 134 (may be taken concurrently) or equivalent. Chemistry of the wood formation. Includes monosaccharide, nomenclature, structures, biosynthesis, reactions, and distribution of terpenoids, fats, flavonoids, tannins, lignins, monosaccharides and polysaccharides, and related chemical transformations in plant material, with emphasis on woody plant structures. Qualified undergraduates may take this course. (SP) Zavarin

238. Special Topics in Wood Science and Technology. (1-3) May be repeated for credit. To be arranged. Minimum of 4 hours of work per week per unit. Prerequisites: Consent of instructor. (F,SP)

238A. Wood Anatomy. (1-3) Advanced study in wood anatomy primarily for advanced graduate students. (F)

238B. Wood Chemistry. (1-3) Advanced study in wood chemistry primarily for advanced graduate students. (F)

238C. Chemical Processing of Wood. (1-3) Advanced study in chemical wood processing primarily for advanced graduate students. (SP)

238D. Wood Mechanics. (1-3) Advanced study in wood mechanics primarily for advanced graduate students. (F)

238E. Wood Physics. (1-3) Advanced study in wood physics primarily for advanced graduate students. (F)

238F. Physical/Mechanical Processing of Wood. (1-3) Advanced study in physical/mechanical processing of wood primarily for advanced graduate students. (F)

238G. Wood Products Pathology. (1-3) Advanced study in wood product pathology primarily for advanced graduate students. (F)

238H. Wood Adhesion and Adhesives. (1-3) Advanced study in wood adhesion and adhesives primarily for advanced graduate students. (F)

238I. Production Management. (1-3) Advanced study in forest production management primarily for advanced graduate students. (F)

238J. Wood Formation and Quality. (1-3) Advanced study in wood formation and quality primarily for advanced graduate students. (F)

239. Seminar in Wood Science and Technology. (1) May be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Current staff and student research and reports in wood science and technology. (SP)

Forestry and Resource Management

Graduate Program in Forestry

Office of Graduate Studies, Room 145, Mullard Hall, University of Wisconsin, Madison 53706. Phone: 624-3765. Graduate Assistant: Stu Johnson. Graduate Fellowship: Zavarin.

145. Chemical Processing of Wood. (3) Two 1-hour lectures plus one 3-hour laboratory per week. Prerequisites: Consent of instructor. Formerly WST 154. The technology and associated chemistry of processing wood and its derivatives, including: pulping, pulp bleaching, papermaking, hydrolysis to sugars and lignin, pyrolysis to organic products, gasification to syngas, and other chemical conversions of wood. Energy and environmental aspects will be considered. (SP) Zavarin

190. Performance of Wood in Structures. (3) Three 1-hour lectures per week. A survey of wood properties and wood products of importance to building design and construction. Case studies dealing with proper use of wood in structures to avoid deterioration failures. (Currently offered as Architecture 159, Section 2, Fall semester). (SP)

198. Directed Group Study. (1-3) May be repeated for credit. Meetings to be arranged. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor. Formerly WST 198. Group study of special problems in forest products. (F,SP) Staff

Graduate Courses

231. Wood Formation and Structure. (3) Two 1-hour lectures and one 3-hour discussion per week. Prerequisites: 131 or equivalent, or consent of instructor. Wood formation and structure, including histotactic activity in primary growth of woody plants and initiation of secondary cambium. Developmental studies of cambium, and regulation through hormonal action. Formation of microfibrils in cell walls. (F) Dodd

232. Advanced Wood Physics. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 132 or equivalent. Formerly Forestry 232. Absorption of water, nonaqueous liquids, adsorption 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 modes of heat transfer important in wood processing and usage. (F) Quarles

233. Advanced Wood Mechanics. (3) Three 1-hour lectures per week. Prerequisites: 133. Formerly Forestry 233. Deformation and fracture of wood, mechanics of the cell wall and current topics from the literature. (SP) Schniewind

234. Chemistry of Polysaccharides, Lignin, and Extractives. (3) Three 1-hour lectures per week. Prerequisites: 134 (may be taken concurrently) or equivalent. Chemistry of the wood formation. Includes monosaccharide, nomenclature, structures, biosynthesis, reactions, and distribution of terpenoids, fats, flavonoids, tannins, lignins, monosaccharides and polysaccharides, and related chemical transformations in plant material, with emphasis on woody plant structures. Qualified undergraduates may take this course. (SP) Zavarin

238. Special Topics in Wood Science and Technology. (1-3) May be repeated for credit. To be arranged. Minimum of 4 hours of work per week per unit. Prerequisites: Consent of instructor. (F,SP)

238A. Wood Anatomy. (1-3) Advanced study in wood anatomy primarily for advanced graduate students. (F)

238B. Wood Chemistry. (1-3) Advanced study in wood chemistry primarily for advanced graduate students. (F)

238C. Chemical Processing of Wood. (1-3) Advanced study in chemical wood processing primarily for advanced graduate students. (SP)

238D. Wood Mechanics. (1-3) Advanced study in wood mechanics primarily for advanced graduate students. (F)

238E. Wood Physics. (1-3) Advanced study in wood physics primarily for advanced graduate students. (F)

238F. Physical/Mechanical Processing of Wood. (1-3) Advanced study in physical/mechanical processing of wood primarily for advanced graduate students. (F)

238G. Wood Products Pathology. (1-3) Advanced study in wood product pathology primarily for advanced graduate students. (F)

238H. Wood Adhesion and Adhesives. (1-3) Advanced study in wood adhesion and adhesives primarily for advanced graduate students. (F)

238I. Production Management. (1-3) Advanced study in forest production management primarily for advanced graduate students. (F)

238J. Wood Formation and Quality. (1-3) Advanced study in wood formation and quality primarily for advanced graduate students. (F)

239. Seminar in Wood Science and Technology. (1) May be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Current staff and student research and reports in wood science and technology. (SP)
courses that provide a common base of knowledge essential for all the options. Another third of the upper division course work is chosen by the student from the set of restricted electives for their option. The final third of the upper division course work is made up of free electives. In consultation with a faculty advisor, students select these free electives to develop individual interests and to broaden their education.

Accreditation and Licensing. Established in 1914, the forestry major at Berkeley was the first forestry degree in California to be accredited by the Society of American Foresters. Completion of the Bachelor of Science degree in forestry provides four years of credit towards meeting the required seven years of qualifying education or professional experience for professional membership in the society. Additional year of credit towards licensing may be obtained by completing the Master of Forestry degree. Students taking the Wildlife Option may obtain the necessary course work for certification as an associate wildlife biologist by the wildlife society. 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 a forester, range conservationist, or wildlife biologist.

Preparatory Program. During the freshman and sophomore years students are expected to complete 8 units of biology, 8 units of chemistry, 4 units of economics, 4 units of English, 4 units of geology, 6 units of calculus, 4 units of statistics. Additionally, freshmen on the Berkeley campus are required to take F10 (Forest and Wildland Resource Conservation) and sophomore on the Berkeley campus are required to take F51 (Forestry Computer Programming and Applications). Students elsewhere are required to take a course in computer programming. Sophomore may also elect to take F21 (Dendrology), F170 (Wildlife Ecology), or F141 (Principles of Range Management) 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, trees, and wildland resource management. It is an introduction to manage wildland resources. Additional year of credit towards licensing may be obtained by completing the Master of Forestry degree. The program provides one year of credit towards the requirement of seven years of qualifying education or professional experience for licensing as a professional forester in California.

Range Management and Wood Science and Technology. The department is closely affiliated with the interdepartmental graduate groups in Range Management and Wood Science and Technology, which offer the Master of Science degree in Range Management and the Master of Science and Doctor of Philosophy degrees in Wood Science and Technology, respectively. For more information, these degree programs refer to the section of this catalog on Interdepartmental Graduate Programs in the College of Natural Resources.

Departmental Facilities. Mullford Hall is the home of the Department of Forestry and Resource Management. It houses the forestry library, which contains the largest collection of books, and periodicals on forestry and natural resource management in the world, specializing for remote sensing and photogammetry, tree physiology, and ecology, wildlife and aquatic biology, and an extensive herbarium and wildlife specimen collection. Departmental computing facilities include a microcomputer laboratory and a high-speed printer, and two terminal rooms for using the campus IBM and UNIX computers. Greenhouses and growth chambers are located near the nearby Oxford tract and at the University Gill Tract. Field facilities include the 3000 acre Bigfoot Forest near Georgetown, Whisker's Forest, Square National Park, the Howard Forest near Willow Creek, Sages Creek Field Station near Truckee, Russell Reservoir near Lafayette, and the Baker Forest adjoing to Forestry Summer Camp. The program also maintains field laboratories located at the Richmond Field Station, and the Wildland Resources Center. The location of the Berkeley campus also provides easy access to the numerous public and private 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 California Department of Fish and Game.

Further Information. For further information on the department's programs, contact the department's Student Services Office in 133 Mulford Hall, 642-6410.

Credible Image: Forest and Resource Management

Graduate Programs

Wildland Resource Science. The department offers the Master of Science and Doctor of Philosophy degrees in Wildland Resource Science. Students may choose to specialize in one of a variety of fields, including agroforestry, biometrics, ecology, economics, fisheries, forestry, genetics, management, photogrammetry, and applications software in natural resource management. The Master of Science degree provides one year of credit towards the required seven years of qualifying education or professional experience for licensing as a professional forester in California.

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Further Information. For further information on the department's programs, contact the department's Student Services Office in 133 Mulford Hall, 642-6410.

Lower Division Courses

10. Forest and Wildland Resource Conservation. (3) Two 1-lecture hours and one 1-discussion hour per week. Ecolectical, social and economic principles applied in the management of wildland resources; forests, range, water, fish and game. (F) Williams

51. Forestry Computer Programming and Applications. (2) Two 1-lecture hour and one 1-laboratory hour per week. Prerequisites: High school algebra. Introduction to computer operating systems, programming, and applications software in natural resource management. Includes the BASIC programming language and computer exercises drawn from forestry applications. (F) Bijing, Gillies

30. Senior Faculty Seminar. (1) One 2-hour seminar every other week. Must be taken on a pass/fail basis. Prerequisites: Forestry major or consent of instructor. Selected topics in forest and wildland management. Readings, meetings, and discussion with senior and emeritus members of the faculty. (F,SP)

Upper Division Courses

Note: Courses 100A-100E comprise the Field Studies Leading to the Master of Science and Doctor of Philosophy degrees in Wildland Resource Science. The department of Wildland Resource Science consists of any five departmental courses (including those taken in other departments). Students may elect to take F51 (Forestry Computer Programming and Applications) as an option to their major emphasis on ecology as a basis for resource management and the maintenance of biological diversity. Field identification of flora, fauna, and soils is emphasized. Extra-sessional.

100B. Silviculture. (Forty hours of lecture and field exercises per week for one week. Prerequisites: 100A. Evaluation of systems for managing forest stands including regeneration, controlling stand density, forest growth, genetics, and tree improvement, and prescribed burning. Extra-sessional.

100C. Forest Measurements, Aerial Photography and Photogrammetry. (Forty hours of lecture and field exercises per week for two weeks. Prerequisites: 100B. Procedures for measuring the forest resource, introduction to land surveying, aerial photography, timber inventory, and measurement of trees and forest growth. Extra-sessional.

100D. Timber Resource Utilization. (Forty hours of lecture and field exercises per week for one week. Prerequisites: 100C. Harvesting and access systems, wood quality, and manufacture of forest products. Visits to industrial operations to evaluate land management practices and utilization regulations. Extra-sessional.

100E. Forest Resource Management. (Forty hours of lecture and field exercises per week for one week. Prerequisites: 100D. An introduction to planning the interactions of water, wood, wildlife, range, fisheries, and recreation to manage natural resources and multiple-use management plans for selected study areas. On-site analysis, presentation, and review of resource plans is conducted.

101. Forest and Wildland Resource Inventory. (Four 3-hour lectures and one 3-hour laboratory per week. Prerequisites: 110, 51, and Statistics 20. Statistical and practical concepts presented to introduce concepts of forest and wildland resource inventory systems. Statistical designs include random, stratified, and 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 estimate of change or growth. (SP) Wansel

102. Forest Photogrammetry and Photo Interpretation. (3) Two 1-lecture hours and one 3-hour laboratory per week. Prerequisites: Algebra. Practical and conceptual presentation of techniques for using remote sensing, specifically aerial photography, for forest resource management. Includes photo measures of scale, parallax area, and object height; flight planning; photo geometry; an introduction to the electromagnetic spectrum; and photo interpretation and mapping. Course concludes with an introduction to digital remote sensing data. (SP) Congallion

103. Forest Harvest Systems. (3) Two 1-lecture hours and one 3-hour laboratory per week. Prerequisites: Upper Division standing in Forestry or consent of instructor. An introduction to computer systems. Access system development for forest management. The appropriate approach of technological means for forest thinning and extraction are explored.
in light of biologic, political, and economic aspects of forest operations. (F) Gasser

104. Forest Mensuration. (2) Two 1-hour lectures plus one 3-hour laboratory per week. Prerequisites: 102B and 101, or consent of instructor. Measurement of height and yield of forest stands using basic techniques from statistics and mathematics. (F) Gasser

105. Wildland Fire Science and Management. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: Four units of economic principles. Methodology of fuel loading, spread, and energy disposition and microclimate; on hydrology, the local waterbalance, and watershed processes in hydrology, the local waterbalance, and watershed processes involving water yield and water quality. Principles applicable to watershed and environmental management through forestry. (F) Zinke

123. Forest Ecology. (4) Three 1-hour lectures and one 4-hour field lab exercise per week plus 2-day (weekend) field trip. Prerequisites: 100A, eight units of biological science, and eight units of chemistry. The influence of the forest and wildland vegetation on energy disposition and microclimate; on hydrology, the local waterbalance, and watershed processes in hydrology, the local waterbalance, and watershed processes involving water yield and water quality. Principles applicable to watershed and environmental management through forestry. (F) Dodd

124. Wildland Systems Ecology. (3) Students who have taken 123A and 123AL during the 1983-84 or 1984-85 academic year will receive no credit for 124A. Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: One biology course. Study of whole system properties, processes, and models; how ecosystems develop; principles of ecosystem maintenance, management, and restoration. (F) Staff

125. Principles and Practices of Silviculture. (4) Three 1-hour lectures and one 1-hour discussion per week. Prerequisites: 123 or course in community ecology. Three Saturday field trips will be scheduled in lieu of several labs. Principles and concepts of the biological aspects of growth, composition, and quality of forest stands and trees. The manipulation of forests and control of stand structure to enhance forest productivity. (F) Helms

128. Forest Genetics and Tree Improvement. (3) Two 1-hour lectures and one 4-hour laboratory per week. Prerequisites: Two units of credit. Principles of genetics and tree improvement. (F) William

129. Principles of Range Management. (4) Two 1-hour lectures and one 4-hour laboratory per week. Prerequisites: Four semester units of biology. Application of plant and animal ecology to the understanding of rangeland ecosystems with emphasis on grazing dynamics. Current and projected management actions to improve production of rangeland goods and services. Lab focus is on the development of a land-use plan for a small UC rangeland property. Field evaluation of the site, use of a GIS 3D team work and production of a final plan are integrated activities in the lab. Occasional field trips may go beyond scheduled lab time, TBA in class. (F) Allen

142. Range Plants. (3) Two 1-hour lectures plus one 3-hour laboratory per week. Systematic relationships and identification of range grasses, forbs and shrubs; their distribution, growth, forage values and responses to use. (SP) Bartolome

143. Wildland Animal Nutrition. (2) Two 1-hour lectures and one 2-hour laboratory per week. Prerequisites: Consent of instructor. Nutrition of wild and domestic herbivores on range and forest lands. Nutritional considerations in management and restoration of wildlife habitat and livestock grazing lands. In¬travenous, or consent of instructor. Application of advanced sampling theory to the measurement of forest and wildland resources, estimators, sampling designs, re¬

144. Range Ecology. (3) Three 1-hour lectures per week. Prerequisites: One course in ecology. The ecological basis for range management, con¬sidered in the context of western range ecosystem types. Specific range improvement and range man¬agement practices are discussed in the context of ecosystem processes. (SP) Bartolome

150. Agroforestry Systems. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: Upper Division standing. Agroforestry principles and systems in use worldwide are examined, with the emphasis on contemporary agroforestry system development and management. Examples of genetic architectures in forest and wildland ecosystems. Field laboratory exercises to illustrate ecological principles and develop techniques for the assessment of forest ecosystems. (SP) Staff

157. Wildlife Management. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 101 or 102 and 170. An advanced coverage of the principles, procedures, and techniques of managing terrestrial wildlife with an emphasis on North American forest and rangeland ecosystems. (SP) Barrett

177. Case Histories in Wildlife Management. (2) Two 2-hour seminars per week. Prerequisites: 170. Seminar format with presentation and discussion by each student, with long term paper requirement. Examination in depth of case histories in wildlife management. (SP) Barrett, Morrison

178. Freshwater Ecology. (3) Two 1-hour lectures and one 1/2-hour discussion, and one 3-hour laboratory per week. Prerequisites: Five semester units of Biology; upper division standing. Description of the biota and their interactions in lakes and streams. Outside reading for weekly discussion on topics of entrophy, thermal pollution, reservoirs, introduced species, spawning of salmonids. Laboratory is an independent research project. (SP) Staff

191. Directed Group Study. (1-5) May be repeated for credit. Meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Group study of special problems relating forestry and resource management. (F,SP)

198. Supervised Independent Study and Research. (1-5) May be repeated for credit. Meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. See regulations regarding restrictions. (F,SP)

Graduate Courses

201. Advanced Forest Sampling. (2) Two 1-hour lectures per week. Prerequisites: 101, 104, or equivalent, or consent of instructor. Application of advanced sampling theory to the measurement of forest and wildland resources, estimators, sampling designs, re-
203. Remote Sensing of Forest and Other Natural Resources. (2) Formerly 202. Students who have received credit for 202 may not receive credit for 203. One 3-hour lecture/seminar per week. Advanced topics covered include remote sensing systems and the use of data derived from interferometric systems, synthetic aperture radar, and other multispectral data. Infrared photography and the use of image processing and computerized information systems will be covered. (SP) Kaskel

204. Advanced Forest Measurement. (2) One 2-hour lecture per week. Prerequisites: 101, 104; Statistics 20; 161 is recommended. This course will cover the analysis of forest measurements using computer programs and other analysis techniques. (SP) Wengel

205. Seminar on Fire As an Ecological Factor. (2) May be repeated for credit. One 2-hour lecture/seminar per week. Prerequisites: Consent of instructor. This seminar will cover the application of scientific and statistical methods related to fire as an ecological factor. (F) Heims

210. Seminar in Advanced Forest Economics. (2) May be repeated for credit. One 2-hour seminar per week. Prerequisites: Basic courses in statistics and the ecological and philosophical bases of forest ecosystems. Advanced study of the role of fire on the forest ecosystem. Special topics will include the economics of fire management. (SP) Davis

212. Seminar in Forest Ecology. (2) May be repeated for credit. One 2-hour lecture per week. Prerequisites: Consent of instructor. This seminar will cover the ecology of the forest ecosystem. Special topics will include the economics of fire management. (SP) McMurray

213. Advanced Forest Management. (3) One 2-hour lecture and one 3-hour laboratory per week. Prerequisites: 101, 102, 104, 113, and 125, or equivalent. This course will cover the application of scientific and statistical methods related to fire as an ecological factor. (SP) Wengel

214. Case Studies in Forest Management. (1-6) May be repeated for credit. Minimum of 4 hours per week per unit of credit. Course requirements may vary with special emphasis on evaluation of investment projects, resource development programs, and land-use planning. (SP) Teegarden

215. Seminar in Forest and Wildlife Resource Policy Analysis. (8) May be repeated for credit. Two 1½-hour lectures/seminars per week. Prerequisites: Consent of instructor. This seminar will cover the application of scientific and statistical methods related to fire as an ecological factor. (SP) Karp

216. Seminar in Sociology of Forest and Wildland Resources. (3) One 3-hour lecture per week. Prerequisites: Consent of instructor. This seminar will cover the sociology of forest and wildland resources. Special topics will include the economics of fire management. (SP) Fortmann

217. Seminar in Sociology of Forest and Wildland Resources. (3) One 3-hour lecture per week. Prerequisites: Consent of instructor. This seminar will cover the sociology of forest and wildland resources. Special topics will include the economics of fire management. (SP) McCullough

218. Wildlife-Habitat Relationships. (3) Two 1½-hour lectures per week. Prerequisites: Consent of instructor. This course will cover the analysis of wildlife-habitat relationships, stressors, and problems involving wildlife management. Topics include multivariate assessment of wildlife habitat, analysis of habitat preferences, indices of diversity, overlap and community similarity, etc. (SP) Morrison

219. Wildlife Management Planning. (3) One 3-hour lecture per week. Prerequisites: Consent of instructor. This course will cover the analysis of wildlife-habitat relationships, stressors, and problems involving wildlife management. Topics include multivariate assessment of wildlife habitat, analysis of habitat preferences, indices of diversity, overlap and community similarity, etc. (SP) Morrison

220. Research and Concepts and Methods. (3) Two 1½-hour lectures/seminars per week. Prerequisites: Basic courses in statistics and the ecological and philosophical bases of forest ecosystems. Advanced topics covered include remote sensing systems and the use of data derived from interferometric systems, synthetic aperture radar, and other multispectral data. Infrared photography and the use of image processing and computerized information systems will be covered. (SP) Wengel

221. Genetics of Forest Trees. (2) May be repeated for credit. One 2-hour lecture per week. Prerequisites: Genetics 110 or equivalent. Coursetopics will include the population genetics of wildland ecosystems. Special topics will include the economics of fire management. (SP) Perkins

222. Seminar in Environmental Forestry and Watershed Management. (2) One 2-hour lecture per week. Prerequisites: Any upper-division course in hydrology, climatology, soil-plant nutrition or physics, or forest influences. Special topics will include the economics of fire management. (SP) Zinke

223. Seminar in Forest Ecology. (2) Course may be repeated for credit. One 3-hour seminar per week. Prerequisites: Consent of instructor. Special topics will include the economics of fire management. (SP) Staff

224. Natural Resource Ecosystems. (2) Course may be repeated for credit. One 3-hour lecture per week. Prerequisites: Consent of instructor. Special topics will include the economics of fire management. (SP) Staff

225. Advanced Silviculture. (2) One 2-hour lecture per week. Prerequisites: 125 or equivalent. Analysis and evaluation of forest management. Format combines both lecture and discussion. Field trips will be included depending on the topic. (SP) Helms

241. Range Assessment. (3) Two 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 141 and Stat 20 or equivalent required. Rangeland vegetation sampling techniques with emphasis on comparing the relative efficiency of different techniques of vegetation measurement. Includes weekly lab exercises on artificial sampling in the field. Juniors and seniors are encouraged. (SP) Allen

243. Seminar on Rangeland Pastoralism. (3) One 2-hour lecture per week and four field trips. Prerequisites: Consent of instructor. Survey of pastoral animal management and production systems, as they influence and are influenced by the rangeland environment. Review of the evolution of animal management practices, contemporary management systems in California, the West and worldwide, and production systems with both traditional and non-traditional goals. Examination of agroforestry and nomadic and transhumant grazing systems, sheep and cattle production, game ranching, and organic meat production will be included. (F) Hunsberger

244. Seminar in Range Ecology. (2) May be repeated for credit. One 3-hour seminar per week. Prerequisites: Consent of instructor. Seminar course dealing with selected topics in ecology of rangelands. (F) Bartolome

245. Seminar in Range Ecosystem Planning and Policy. (2) May be repeated for credit. One 3-hour lecture per week. Prerequisites: Consent of instructor. Seminar course dealing with selected current topics in range ecosystem planning and policy. F) Safart

270. Seminar in Wildlife Biology and Management. (2) May be repeated for credit. One 3-hour lecture per week. Prerequisites: Wildlife 170 and 176. Reading, conference, and discussion. Topics and discussion of recent studies in wildlife biology and management. Open to qualified graduate students from other departments. (F) McCullough

300. Supervised Teaching in Forestry and Resource Management. (1-8) May not be used to satisfy unit or residence requirements. May be repeated for credit. To be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individually arranged directed research under the supervision of a faculty member. This course is intended to provide credit for experience obtained. (SP) Fenderson

301. Individual Study for Master's Students. (1-8) May not be used to satisfy unit or residence requirements. May be repeated for credit. To be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study for the comprehensive examination in consultation with the major field adviser. (F,SP)

302. Individual Study for Doctoral Students. (1-8) May not be used to satisfy unit or residence requirements for the doctoral degree. May be repeated for credit. To be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study for the comprehensive examination in consultation with the major field adviser. (F,SP)

Professional Courses

300. Supervised Teaching in Forestry and Resource Management. (1-8) May not be used to satisfy unit or residence requirements. May be repeated for credit. To be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor and appointment as T.A. Supervised teaching experience in a departmental course. (SP) Fenderson

400. Professional Training in Research. (1-6) May not be used to satisfy unit or residence requirements. May be repeated for credit. To be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor and appointment as T.A. Supervised teaching experience in a departmental course. (SP) Fenderson
French

(College of Letters and Science)

Office: 4125 Dwinelle Hall, 642-2712
Chair: Leo Bersani, Ph.D.

Professors:
- Leo Bersani, Ph.D. 19th- and 20th-century literature
- R. Howard Bloch, Ph.D. Medieval literature
- Marnie Condie, Ph.D. Francophone literature
- Joseph J. Duggan, Ph.D. Medieval literature
- Suzanne Friedman, Ph.D. Comparative romance linguistics
- Basili Goy, Ph.D. 16th-century literature
- Laurent Joly, Ph.D. 15th- and 16th-century literature
- Walter E. Rex, Ph.D. 18th-century literature
- Alexandre E. Rix (Emeritus)
- Alvin A. Eustis, Jr., Ph.D. (Emeritus)
- Irving Butler, Ph.D. (Emeritus)

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- Vincent Kaufmann, Docteur ès Lettres. 19th- and 20th-century literature
- Jacqueline Lichtenstein, Doctorat de l'EHESS. 17th-century literature
- Ann A. Smock, Ph.D. 20th-century literature

Assistant Professors:
- Timothy Hampton, Ph.D. Renaissance literature
- Michael Lacey, Ph.D. 19th- and 20th-century literature

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- Alvin A. Eustis, Jr., Ph.D. (Emeritus)
- Irving Butler, Ph.D. (Emeritus)

Associate Professors:
- Bertrand P. Augst, Ph.D. 20th-century literature
- Vincent Kaufmann, Docteur ès Lettres. 19th- and 20th-century literature
- Jacqueline Lichtenstein, Doctorat de l'EHESS. 17th-century literature
- Ann A. Smock, Ph.D. 20th-century literature

Assistant Professors:
- Timothy Hampton, Ph.D. Renaissance literature
- Michael Lacey, Ph.D. 19th- and 20th-century literature

The University of California, Berkeley

Jacqueline Lichtenstein, Doctorat de l'EHESS. 17th-century literature
"...working in France, I've found that language..."
214 / French

103B. Language and Culture. (3) Three hours of lec
ture per week. Discussionof compositionbased on the

analysis ofcultural texts. (F,Si=>)
112A-112B. Medieval Literature. (3;3) Qne course
from 112A-B may be repeated once for credit with a

differenttopicand withconsent of the Undergraduate
Adviser. Three hours of lecture per week. Prerequi
sites: 102 and 103A or 103B, or equivalent. Medieval
literature from the Chanson de iTolandto the Roman
de la Rose. (F,SP) Bloch, Duggan
-

114A-114B. Late Medieval Literature. (3;3) Three
hours, oflectureper week. Prerequisites: 102and 103A

or 103B, or equivalent Late Medieval literature:

Joinvilie.to Villon. (F,SP) Johnson

116A-116B. Sixteenth Century Literature: Marot to
Montaigne. (30) Three hours of lecture per week.
Prerequisites: 102 and 1Q3A or 103B/or equivalerit
Poetryand prose ofthe first halfofthe 16thcentury, in
the context of the intellectual and aesthetic trends of

the time, including humanism;evangelism, and the de
velopment of a.new poetic language. (F,SP) Johnson
117A-117B. 17th Century Literature. (3;3) One
course from 117A-Bmay be repeated prtce for credit

with a different topicand cpnsent ofthe undergraduate
adviser. Three hours of lecture per week. Prerequi
sites: 102 and 103A or 103B,or equivalent.

sent of the Undergraduate Adviser.Three hours of leeture per Week. Prerequisites: 102 and 103A or 103B,
or equivalent. The course will focus on literary criticism
and discuss the various options proposed as wall as

the relationship between criticism and fiction or phi

150A-150B. Women in French Literature. (3;3)
Three hours of lecturf per week. Prerequisites: 102

123. Prose Fiction. (3) Three hours of lecture per
week. Prerequisites: 102 arid 103Aor 103B or eqqivalent Studies in the French novel. (F,SP)

and 103A or 103B, or equivalent A study of French
women as portrayed In French literature and of the

*124A-124B. Modern Theatre. (3;3) Three hours of
lecture per week. Prerequisites: 102 and 103A or

103B, or equivalent.Studies in 20th-centurytheatre.
125A-125B. Poetics and Poetiy. (3;3) Three hours

of lecture per week. Prerequisites: 102 ancf l63A or

tensive study of a major author. (F.SP)

130^Writing in French. (3) Three hours of lecture per
week. Prerequisites: 102 and 103Aor 103B or eqlnvalent Advanced language, intended to enlarge vo

cabulary and increaseability with French through ex

solve the crisis in Renaissance values, formulation of

131A-'131B. Translation and Debate. (3;3) Three

theatre. Preciosity, Descartes and rationalism.

hours of lecture per week. Prerequisites: 102 and: 103A

6r 103B, or equivalent in-depth knowledge of the

Frenchlanguage and accuracy in its use are the godls
B:The concept of classicismand the developmentof of this course. A textbook and systematic exercises will
tragedy. Jansenism, the doctrine of Port-Royale. So- . be used to assist in the demanding task of translating,
mainly from English to French. (SP) Sorgen •
cial satire and comedy. (F,SP) Lichtenstein
132.
History of the French Language. (3) Three
118A-118B. Eighteehih Century Literature. (3;3)
hours oflecture Pier week. Prerequisites: 102and 103A
Three hours of lecture per week. Prerequisites: 102

and103A or lb3B, orequivalent
A. Authors from the ficsthalfof the 18th century, with
emphasis on the originsof the pi|iilosophical movement
and the development of modern art forms in the the

ater and the novel; B.Astudyofauthors ofthesecond
halfof the 18th centurystressing the importanceof the
"Movement Philosophique", and the development of

Libertine valuesas well as the emergence ofthe preRomantic aesthetics. (F,SP) Guy, Rex .
119A-119B. Nineteenth Century Literature. (3;3)
Course may be repeated once for credit with different
subject and approval of the Undergraduate Adviser.

Three hours of lecture perweek. Prerequisites: 102

or 103B, or equivalent. Mainly devoted to "external"
history of French, tracing spread of Latin to what is
now France, its break-up into different languages and
dialects, emergence of Parisian French as standard.

Influence of other languages on French vocabulary.
Study of brieftexts fromdifferentperiods to illustrate
evolution of pronunciation and grammar. (F,SP) Fleischman.

133. Theory of Utterance (theorie de i'enonciation).
(3) Three 1-hourlectures per week. Prerequisites: 102

and 103A or f(?3B. Bridging linguistics and philosophy
of language, this course Will develop O. Ducrot's "the
ory of utterance" and apply it to French. This,theory

and 103Aor 103B, or equivalent

looks at natural language utterances (enonces) with a
viewtoward showing how their meaning yields a com

A. Authorsfrom' the firsthalfof the nineteenthcentury.

mentary on the act that produced them (erionciation).

Romantic poetry anddrama. Balzac, Stendhql andthe

This theory of utterance is developed outof but goes

novel. Micheletand the emergence of history.

beyond speech-act theory, proposingan interpretation
of speaking as "polyphonie", as a kindof theatricalrep

B, Authors from the second half of the nineteenth cen-

ttiiy. The various poetic movements: Le Parnasse and
Syrhbolism. Development of the novel, realism and
. naturalism. (F,SP) Sersan/, Kaufman, Lucey

resentation. {F,SP)

*135.Frenqh Dialectology. (3) Three hours of lecture
vper week. Prerequisites: 102 and 103A or 103B or
12^0A-120B. Twehtieth Century Literature. (3;3) equivalent The varieties of French spoken in France
Qne coursefrom 12bA-,B may be repeatedonce for as wellas in French-speaking areas outside of Europe.
credit witha differenttopic and consent of the under
137. French for Economics, Politics and Business.
graduate adviser. Three hours of lecture per week.
(3) Three hours of lecture per week. Prerequ/s/fes;
Prerequisites: 102 and iOOA or 103B,or equivalent
102 and 103A or 103B or equivalent. Introduction to
A. Themodern nbyel, theavant-garde, cubist poetry, the Ff;erich vocabulary and jsyntax specific to eco
nomics, politics and business. Oral and written comDada and SurrealiSrh, the theatre before the Second
prehensiori, written compositions (including corre
World war.
spondence), translations, training in oral expression.
B, Developmentof the novel,poetry and theatre since
Conducted entirely in French. (F,SP) Sorgen
WWII. Sartre and existentialism, theatre of the absurd,
*140. Readings In French Literature. (3) Three
nouveau roman. (F.SP) Bersan/, Smoc/c

121A-121B. Literary Themes/Genres, and Struc
tures. (3;3) Three hours of lecture per week. Pre

requisites: i02and 103A ori03B, orequivalent. Top

contributions of women tb French literature and

thought. (F.SP)

151. Francophone Literature, (3) Maybe repeated

tor.credit once with a different topic. Three hours of lec
ture per Week. Prerequ^ites: 102 and 103Aor 103B or

equivalent. A study OtFrancophone literature: tradi
tional and Frerlch Influ^ces, structure, relationship be-

103B,or equivalent Studies in French poetry: (F,SP) t tween language and rtiessage. (F,SP) Conde

128. Senior Seminar. (3) May be repeated once for
creditwitha different topicand withconsent of the un
dergraduate adviser. Three hours of lecture per week.
Prerequisites: 102 and 103Aor 103Bor equivalent In

A.Authors from the first half of the 17th century. The
Baroque; its chief exponents, literaryattempts to re
new concepts in philosophy and psychology, experi

(3) Three hours df lebtCire per week. Major tdXts of
modern literature. Readings, lectures and examinEn
glish. Does notcount torthe French major.

losophy In a given writer's work. (F.SP)

amples, Illustrations and close study of short literary
excerpts. In-depth corrections of compositions, and oc
casional debates. {f)Sorgen

ments with traditional fqrms in poetry,fiction and the

*146.20th Century Flinch Literatbie inTranslation.

hours of lecture per week. Prerequisites: Reading

knowledge of French. Readings in French. Glass dis
cussions and exercises in English. Does not count for
the French major. ,

ics vary from year to year. One course from
121A-121Bmay be repeated once for credit witha dif
ferent topicarid consent of the undergraduateadviser^
(P'SP)-

*145A-145B. French Literature in English Trans
lation. (3;3) Three hours of iecture per week. Does
not count for the French major.

122A-122B; Literary Criticism. (3;3) Course may be
repeated once for credit with different topic and con

A. MiddleAges to the French Revolution. B. The Nine
teenth Century.

*152. Quebecois Liteiiature and Culture. (3) Three
hours of lecture per week. Prerequisites:102 and 103A
or 103B or equivalent A study of Quebecois culture
and civilization:noveia, films, society.

160A-160B. r^ench Historical Writing. (3;3) Three
hours of lecture per week. Prerequisites: 102 and103A

or ld3B, orequivalent The development ofconcepts

of history in French wt;(ting. The Chroniquers, the hur
manists. Bossuet, Micjhelet are examples of the au
thors who may be studied. Topics vary from year to
year.:(F,SP)

161A-161B. A Year in French History. (3;3) One
course from 161A-B may be repeated once for bredit
with a different topic and with consent of the under
graduate adviser, Three hours of lecture per week.

Prerequisites: 102and 103A or ld3B, or equivalent
The study of a year in French history from many points
of view-poiitical,sociological, intellectual, and artistic,

as well as literaiy. (F)
162A-162B. Perspectives on History. (3;3) Three
hours of lectureper we#, Prerequisites: 102and 103A

or103B, orequivalent^ls course Will study both con

temporary aqd subsequent reaction to historical bvents
or figures.. Topics vary|rom year to year. (F,SP)
170. French Films. (3) Four hours of lecture and two

hours ofstudio work perweek. Prerequisites: 102 and
103A or 103B, or equlyalehi. Beginning French cin^ema studies: The language of film. (F) Dutoit
171A-171B. A Concept in French Cultural History.
(3;3) Three hoursrof lecture per wedk. Prerequisites:

132and iOOA or 103B} or equivalentAnexarmnetlon

Of bedain largecultuial concepts from a double point,
of view for example, the Baroque ,or Romanticism.
Topics vary from year to year. (SP) Staff

172A-172B.Bsychoahalytic Theory aiidLiterature.
(3;3) Three hours Of l^ture per week. Prerequisites:
102 and 103A or 103Bj or equivalent The relevance '
of psychoanalysis to literary texts. Concepfe of fantasy,
of the self, and of desire applied to texts by Rabihe,

Balzac, Lautreamont, Rimbaudand Proust. (F)
173. Linguistics and Literature. (3) Three hours of
lecture per week. Prerequisites: 102 and 103A or

103B;176, or equivalent.The impactof linguistics on
the theoryof literature and the practiceof literary crit
icism in recent years. Students should have taken 176,

or any introductory linguistics course, or have the con
sent of the instructor before,enrolling. (F,SP)
174. Music and Litera^re. (3) Three hours of lecture
per week. Prerequisites: 102 and 103A or 103B or '

equivalent. Aconsideritipnof the ways inwhich cer
tain writers, as well as some composers, have sbught
to relate what might bp thought of as;two. manifesta
tions of language: song[ and poem, or musical score

and literary text. (F,SF| Smock
175A-175B. Literature and the Visual Arts. (3;3)

Three hours of lecturejper week. Prerequ/s/tes; 102
and 103Aor lOSB. or equivalent. Using various works
from the arts and the hUrrlan sciences, this course will

beaninvestigation intb; the relations beto/een images

and written texts. (F,SP)/./c/ifenste/n

(3;3) Ohree hours ofl#itUre perweek. Prerequisites:
102and 103A or lOOBlprequivalent:132dr cohsent


of instructor. Formerly French 176. An introduction to the major branches of linguistic analysis (phonology, morphology— including word formation-syntax and semantics—applied to the French language. (F) Fleischman

177A-177B. History and Criticism of Film. (3;3) Four hours of lecture and two hours of studio work per week. Prerequisites: 102 and 103A or 103B, or equivalents; 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) Dutot

178A-178B. Studies in French Film. (3;3) Three hours of lecture and one hour of laboratory per week. Prerequisites: 102 and 103A or 103B, or equivalents; 170 or equivalent. Topics vary from year to year. (F,SP)

180A-180D. French Civilization. (3;3;3;3) Three hours of lecture per week. Prerequisites: 102 and 103A or 103B, or equivalent. Survey of French civilization: History, Art and Society, through the interpretation of literary texts. One course from 180A-B-C-D is required for completion of the Option B French major. 180A: The Middle Ages; 180B: The Ancien Regime; 180C: The Nineteenth Century; 180D: The Twentieth Century. (F.SP)

183A-183B. Configurations of Crisis. (3;3) Course 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 and 103A or 103B, or equivalent. A study of the pressures on artistic, political, and social 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. (3;3) Three hours of lecture/discussion per week. Prerequisites: 102 or 103A or 103B, or equivalent. (Formerly 127) A survey of French literature from the Middle Ages to the end of the eighteenth century, in which we will study the greatest masterpieces of French literature prior to the Revolution. (F.SP) Rex

186A-186B. French Texts. (4;4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. (SP) Johnson

197. Field Studies. (1-4) Course may be repeated for credit. Two hours of fieldwork per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of Instructor. Field programs involving experiences in schools and related activities. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

199. Supervised Independent Study and Research for Advanced Undergraduates. (2-4) Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Restricted to seniors with overall GPA of 3.0 and GPA of 3.0 in French. Enrollment restricted according to College regulations. Individual instruction only in areas not covered by courses. (F,SP)

Graduate Courses

201A-201B. History of the French Language. (4;4) Three hours of seminar per week.

A. External history of the French language

B. Historical Grammar (F) Fleischman

203. French Syntax. (4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year; current topics in the Department of French. (F,SP)

204. Oral Argumentation in French. (4) Two 1-hour lecture/discussion per week. Study of narrative structures and theories of rhetoric in the French language through close analysis of texts. (F) Spergen

205. Language Theory in the French Tradition. (4) Three hours seminar per week. Diachronic survey of theories of language and grammar in the French tradition, tracing particular lines of thought across linguistic movements of various periods. To include: be-

ominal, prenominal, locative, and adverbial grammaticality in Francophone and Latin in the XVI; Port-Royal and the philosophical grammarians; historico-comparativism in the XIX; Sausure and the structuralist legacy (semiotics, grammatology). (F.SP) Fleischman

209. Morphological and Syntactical Analysis of English and French. (3) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year. Students should consult the Department's Announcement of Courses for current topics. (F) Bloch, Duggan

210A-210B. Studies in Medieval Literature. (4;4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year. Current topics may be found in the Department's Announcement of Courses. (F) Bloch, Duggan

211A-211B. Reading and Interpretation of Old French Texts. (4;4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year. Students should consult the Department's Announcement of Courses for current topics. (F) Bloch, Duggan

212A-212B. Old Provençal Literature. (4;4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Reading and analyzing 12th and 13th century texts written in the langue d’oc with special emphasis on troubadour lyric poetry. (F,SP) Duggan, Fleischman

218. Studies in Late Medieval Literature. (4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year. (SP) Johnson

220A-220B. Studies in 16th Century Literature. (4;4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year; see the Department's Course Description for current topics. (F) Johnson

230A-230B. Studies in 17th Century Literature. (4;4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year; see the Department's Course Description for current topics. (SP) Lichtenstein

231. Baroque Literature. (4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Seminar study of baroque poetry, drama and novel, treating one genre each year. (F,SP)

240A-240B. Studies in 18th Century Literature. (4;4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year; see the Department's Course Description for current topics. (F) Rex

243. The 18th Century Novel. (4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year; see the Department's Course Description for current topics. (F) Rex

250A-250B. Studies in 19th Century Literature. (4;4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year; see the Department's Course Description for current topics. (F)

251. Francophone Literature. (4) One 3-hour 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 and modernist; the search for national identity and modernity. (F) Conde

253. Nineteenth Century Fiction. (4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. (F)

254A-254B. Nineteenth Century Poetry. (4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Studies in 19th-century French poetry. Topics will vary from year to year. (SP)

260A-260B. Studies in 20th Century Literature. (4;4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year. See the Department’s Course Description for current topic. (F)

265. Modern Theatre and Cinema. (4) Course may be repeated for credit as topic varies. One 3-hour seminar per week.

270A-270B. Literary Criticism. (4;4) One 3-hour seminar per week. A study of various critical approaches to literature.

275A-275B. Problems of Literary Theory. (4;4) Course may be repeated for credit as topic varies. One 3-hour seminar per week. Offerings vary from year to year. See the Department's Course Description for current topics. (F)

280A-280B. Interdisciplinary Studies in French. (4;4) Two 1/2 hours seminar per week. Interdisciplinary team-taught courses offered through sponsorship of the Townsend Center for the Humanities. It will investigate, through historical and literary modes of analysis, the invention of the French nation and national identity in the medieval and early modern periods. See department for current topic. (F)

282. French Literary and Social History. (4) One 3-hour 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 course. One 3-hour seminar per week. Study of the works of French artists and writers living in the second half of the nineteenth century. Emphasis on Delacroix, Courbet, Manet, Degas, the Impressionists, Van Gogh, Gauguin and Cezanne; reading from re- volving the writing of a report. May not be substituted for available graduate courses. (F)

299. Individual Research. (4-12) Course may be repeated for credit. Individual conferences. Reserved for students directly engaged in writing the doctoral thesis. (F,SP)

301. 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 in consultation with the field ad- viser. (F,SP)

302. Individual Study. (1-8) May not be used to sat- isfy units or residence requirements. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: M.A. or completion of at least 16 units beyond B.A. Individual study with an advisor, intended to provide an opportunity for qualified stu- dents to prepare for the various examinations required of candidates for the Ph.D. (F,SP)

Professional Courses

301. 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. Prerequisites: For graduate students teaching at college level. Re- quired for all new T.A.s. Bi-weekly lectures on method- ology, grading and testing, demonstration class with required attendance five times per week; language laboratory observations; supervised classroom prac- tice. Additional seminars and discussion sections on various teaching issues. Required for all Graduate Student Instructors teaching French 1 for the first time. (F)

302. 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 in French
2. Demonstration class with required attendance five times per week; laboratory observations; supervised classroom practice. Additional seminars and discussion sections on methodology. Required for all Graduate Student Instructors teaching French 2 for the first time. (F)

303. Teaching French in College: Second Year. (5) Course may be repeated for credit. Three hours lecture and one hour laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 301, 302 or equivalents. Lectures and discussion on the methodologies used in teaching second-year French, grading and testing; occasional attendance at demonstration class; language laboratory observations; supervised classroom teaching. Required of all instructors teaching French 3. (F)

304. Teaching French in College: Advanced 2nd Year. (3) Course may be repeated for credit. Three hours lecture and one hour 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; occasional attendance at demonstration class; language laboratory observations; supervised classroom teaching. Required of all instructors teaching French 4. (F, SP)

**Interdepartmental Studies Courses**

Upper Division Courses

IDS 118. Enlightenment and the Visual Arts in 18th Century France. (4) Three hours of lecture per week. Prerequisites: Students must have a reading knowledge of French and/or appropriate background in the history of Western art. This course will deal with the inter-relationship of the visual arts and ideas. Starting with those elements which were carried over from classicalism in the 17th century, the course will examine topics indicative of a change in style, ideas and attitudes, fostered by selected points of interest. Sponsoring departments: History of Art and French. (F) deCaso, Guy

IDS 135. Mozart and Beaumarchais: The Figaro Cycle. (4) Three hours of lecture plus extensive listening or music, or consent of instructor. Beaumarchais's plays as a portrait of European society of the eve of the French Revolution, and their musical settings by Mozart are considered. Also included will be Mozart's Don Giovanni and Cosi fan Tutte, both composed in response to the success of Le Nozze di Figaro. Don Giovanni will be studied in conjunction with Molière's Don Juan. Sponsoring departments: Music and French.

Freshman and Sophomore Studies

(Division of Undergraduate and Interdisciplinary Studies, College of Letters and Science)

Office: 325 Campbell Hall, 642-8363

Associate Dean: Mitchell Breitwieser, Ph.D.

Freshman and Sophomore Studies attempts to enhance the academic experience of lower division students. Freshman and Sophomore Studies office administers the tutorial programs at the Clark Kerr campus and the Stern and Bowles residence halls, and the Medical Cluster Program. Students may continue through these programs. Also included will be lower division seminars designed to maximize professor-student interaction in the classroom and for information about the courses listed in this section.

**Lower Division Courses**

Note: Freshman and Sophomore Studies 44A and 44B and 5-unit sections of 44C and 44D satisfy one-half of the L&S Reading and Composition requirement.

22. Emeritus Seminar. (2) Course may be repeated for credit. Two hours of lecture per semester. Must be taken with permission. Formerly UGIS 44E. Seminars for lower division students conducted by Professors Emeritus. The topics will vary and usually reflect an interdisciplinary approach. (F, SP) Staff

44A. Topics in Western Civilization. (5) Four hours of lecture and two hours of discussion per week. Prerequisites: Completion of Subject A required. Open to Freshmen only. Formerly UGIS 44A. Home's 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 research will involve interdisciplinary approaches with an emphasis on the development of skill in writing. (F)

44B. Topics in Western Civilization. (5) Four hours of lectures and two hours of discussion per week. Prerequisites: Completion of Subject A requirement, 44A or equivalent; open to Freshmen only. Formerly UGIS 44B. Will include the New Testament, readings in Medieval literature (St. Augustine and Dante) and the history and literature of the Renaissance. The course will meet in small groups for discussion, lectures, discussions and assignments will involve interdisciplinary approaches with an emphasis on the development of skill in writing. (SP)

44C. Topics in Western Civilization. (4-5) Variable. Prerequisites: Subject A required. 44A-44B recommended. Formerly UGIS 44C. Beginning with the "Enlightenment," roughly from the last years of the 17th Century through the 18th Century, or from the constitutional revolution in England (1688) through the French and American revolutions. Will meet in small groups for discussion and for writing. (F)

44D. Topics in Western Civilization. (4-5) Variable. Prerequisites: Subject A required; 44A-44B recommended. Formerly UGIS 44D. From the Industrial revolution to the present; the world of Jane Austen, Beethoven and David to that of Kafka, Shoenberg and Picasso; from ranks and orders to mass society, readings include novelists, poets, and theorists like Marx and Freud. (SP)

78. Undergraduate Colloquium. (1) Course may be repeated for credit if topic and instructors change. One 1½-hour lecture per week. Must be taken on a passed/not passed basis. Formerly UGIS 79. Topics change each semester. Check with Freshman and Sophomore Studies, 325 Campbell Hall, for current topic. (F, SP) Staff

98. Directed Group Study. (1-4) Number of hours per week to be announced. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor required. Seminars for the group study of selected topics, which will vary from semester to semester. (F, SP)

Declared students continuing in the genetics major in the College of Letters and Science may contact Sylvia in the Department of Molecular and Cell Biology, 121 Ordway Hall, for enrollment in Genetics 100A-100B. The fall semester 1989 are strongly encouraged to contact the Office of Student Affairs, 106 Giannini Hall, for referral to a committee to consider changing their major to one in a department listed above. (F)

Graduate Program: As part of the reorganization of the biological sciences at Berkeley, genetics is undergoing a renaissance and is heavily represented in the faculty. Of the three new departments for research in biology: Molecular and Cell Biology, Integrative Biology, and Plant Biology. The Department of Molecular and Cell Biology has its own Division of Genetics. Other biologists contribute to the molecular biology program, which offers graduate work in molecular and cell biology. Both M.S. and Ph.D. degree programs are available, and the program is flexible in areas of concentration.

**Geography**

(College of Letters and Science)

Department Office: 501 Earth Sciences Building, 643-1701
Chair: David Stoddard, Ph.D.

Professors:

Omar E. Granger, Ph.D. University of Toronto. Climatology, pure and applied.
Peter Hall, Ph.D. Cambridge University. Urban, world cities, planning. (F, SP)
David Hooson, Ph.D. London School of Economics. Soviet Union, history of geography. (F)
Bernard Nietschmann, Ph.D. University of Wisconsin. Fourth World geography.

Theodore M. Oberlander, Ph.D. Syracuse University. Geomorphology, arid lands.

Allen George, Ph.D. University of Chicago. Social theory, local and regional transformation.

David Stoddard, Ph.D. Cambridge University. Coastal geomorphology, ecological systems. (SP)

James E. Vance, Jr. Ph.D. Clark University. Urban, world cities, planning. (SP)

Richard A. Walker, Ph.D. Johns Hopkins University. Economic geography, environmental studies, United States.

Michael J. Watts, Ph.D. University of Michigan. Agriculture, rural development, Africa.

James J. Parsons, Ph.D. (Emeritus) University of California at Los Angeles, Latin America, historical.

Hilgard C.R. Steinberg, Ph.D. (Emeritus) Louisiana State University. Environment, tropics, Brazil, Amazon.

Associate Professors:

Roger Byrne, Ph.D. University of Wisconsin. Biogeography, paleoecology, pollen analysis.

Beatrice M. Falgout, Ph.D. University of Georgia Tropical Geography and Botany.

Assistant Professors:
Michael John, Ph.D. Johns Hopkins University. Latin America, development issues, urban
Lisa E. Wells, Ph.D. Stanford University. Geomorphology, georegression, paleoclimatology, Latin America.

Departmental Major Advisor: Consult Student Services Assistant; Graduate Advisor: Mr. Walker
Advice concerning requirements for undergraduate and graduate students is offered by the departmental advisor; guidance in the student's special field of interest is received by the senior member of the staff. New students entering the department at any level must consult the departmental advisor before the application or assignment of courses.

The Geography Department aims to provide a broad ranging perspective on humans as inhabitants and transformers of the face of the earth. The search for this kind of understanding involves thorough study of (a) the interlocking systems of the natural environment (climate, landforms, biota) and the evaluation of natural resources; (b) those diverse historical, cultural, social, economic, and political structures and processes which affect the location and spatial organization of population groups and their activities; and (c) significant geographical units, whether described as cities, regions, nations or landscapes, where integrated interpretation can be attempted, and a variety of problems thereby better understood.

The undergraduate major in geography therefore includes the study of various aspects of human, physical, and regional geography as well as cartography, quantitative methods, and field work. Backgrounds in the natural and social sciences, history, and statistical methods will be found useful to the geography major, the emphasis depending on the student's particular interests.

The Major
Lower Division. Geography 1, 4, and 7. (Transfer students who have had introductory courses elsewhere should consult with the departmental undergraduate advisor in order to avoid repeating lower division work.)
Upper Division. A minimum of 36 units. One course from each of the following groups: 100-109; 110-125; 130-149; 140-172; 180-189. Students must fill out their programs by completing at least 18 units from courses within one of the following specialties: physical, cultural, urban-economic, environmental resources, and regional. All students are encouraged to take 180 and 189.

Graduate Program. With the consent of the major advisor, a student with an overall grade-point average of 3.5 or higher and a grade-point average of 3.5 or higher in courses in the major may apply for admission to the honors program. Application for acceptance in the program should be made by the beginning of the senior year. A senior in the honors program must complete Geography H195A and H195B, in which a thesis is required, and may take graduate seminars.

The Minor
Students in the College of Letters and Science may complete one or more of their minors, normally in a field both academically and administratively distinct from their major.
Required: Five upper division courses, all taken for credit. The overall grade-point average of 2.0 is required in all courses applied to the major. Students with a minor in geography must take (a) at least one course in the physical geography series (140-149), and (b) at least one course in either the cultural series (100-109), the urban-economic series (110-125), or the environmental series (130-149). Students planning to apply a course toward a degree in geography are advised that several offerings (180, 181, and 183) require permission of the instructor.

Graduate Program
Geography deals with a broad spectrum of questions relating to society, environment, and spatial order. A variety of previous backgrounds may prove useful in the field. Although the department offers graduate training in physical, cultural, economic, urban, and regional geography, it places strong emphasis on the interdisciplinary nature of these specialties and related approaches in other disciplines.

The M.A. program involves completion of not less than one year of residence, course requirements that vary with the background of the student, and an original thesis or a comprehensive exam. Ph.D. candidates must complete a minimum of two years of residence (normally at least three for those entering from other disciplines) and pass the oral qualifying examination. In the preparation of many theses they must also be prepared to spend a year in field or archival research following the oral examination. Further details, including foreign language requirements, are available from the departmental office.

Lower Division Courses
1. Introduction to Physical Geography. (4) Three hours lecture and one 2-hour laboratory per week. Origin of the Earth's major geological and climatological features and their impact on the characteristic of landforms, vegetation, and soils. Problems relating to the interrelationships between physical factors in the principal natural regions of the Earth. (F,SP) Byrnes, Granger
2. Introduction to Cultural Geography. (4) Three hours lecture and a 1-hour laboratory per week. Historical and contemporary cultural-environmental patterns. The development and spread of cultural adaptations, human use of resources, transformation and conflict of human environments. (F,SP) Nietschmann, Reed
3. The International System. (4) Three hours lecture and a 1-hour laboratory per week. An introduction to economic geography. Various conceptualizations of production, the household as an economic unit, and the pattern of patterns of daily life. Focus on multinational corporations, technology, and the new service economy, the changing economic role of women, the shifting location of employment and community definition. (F,SP) Byrnes, Granger
4. A reading and research seminar for freshmen and sophomore students. Topics to vary. (F,SP) Hooz

Upper Division Courses
100. Cultural Geography of Indigenous Peoples. (4) Three hours of lecture per week. Worldview, 168 states claim the territories, resources and peoples of some 5000 Fourth World nations. This causes large-scale geographic changes in land and resource use, economics, and governments of indigenous peoples and their nations. Resultant state-nation conflicts now account for most of the world's wars, refugees, genocide and terrorism. Focus on the geopolitical base to indigenous nations and contemporary economic, political, ecological and military invasions and disruptions.

101. Cultural Geography of Urban Environments. (4) Three hours of lecture per week. Population, environment and urbanization; cultural geography and human settlements; cities as expressions of varying cultural traditions.

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 urbanization in the contemporary city in the Third World. (SP) Reed

107. Geography of Religions. (4) Three hours of lecture per week. Impact of belief systems on landscapes and environments; distribution of religions, sacred places, and spaces; pilgrimages; religious influences on population dynamics; holy cities; religion and political geography. (SP) Reed

108. Political Geography. (4) Three hours of lecture per week. The evolution and viability of selected national blocs and geopolitical alliances. European imperialism and the "new nations"; sensitive frontiers. Internal coherence, capitals, area-cores, and centrifugal forces. A comparative evaluation of world power.

109. Prehistoric Agriculture. (4) Three hours of lecture per week. Agricultural origins and dispersals in the light of recent biological and archaeological evidence. (F) Byme


111. Local and Regional Transformation. (4) Three hours of lecture per week. The simultaneous transformation of localities and the regional environment. Different forms of consciousness. Theoretical issues pertaining to human agency and the simultaneous making of history and production of places. Detailed case studies of cultural and urban social-economic change and present, from North America, Europe and the "Third World". (SP) Pred

112. Historical Geography of Transportation. (4) Three hours of lecture per week. The influence of geographical factors in the creation, transformation, and maintenance of transportation technologies and patterns; the shaping of patterns of settlements and economy by transportation innovation; the role of transportation in regional development in western Europe and Anglo-America. (SP) Vance

115. World Agricultural Systems. (4) Three hours of lecture per week. An examination of world agrarian systems, patterns of resource use, and their relation to development. Special attention is given to peasant livelihood, plantations, agricultural growth, patterns of labor use, agro-ecology and rural development.

116. Economic Geography of the Non-Industrial World. (4) Three hours of lecture per week. Patterns and processes of economic change at the local level in the Third World. Topics include the household production, marketing and transportation, the growth of non-agricultural activities, and the emergence of new small-scale industries, the informal sector, and rural industrialization. (SP) Watts

120. Morphogenesis of the Western City. (4) Three hours of lecture per week. Historical development of the physical structure of western cities and urban industrial, and commercial growth. Historical development, patterns of labor use, agro-ecology and rural development.

125. Social Geography. (4) Three hours of lecture per week. The spatial expression of social relations in the U.S. from the 19th century to the present. Immigrant, segregation, division of labor by gender, race, and class; work place-residence relationships. Feminist theory as a tool in social geographic research. (F)

130. Natural Resources and Population. (4) Three hours of lecture per week. Examination of 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. (SP) Watts

133. Islands and Oceans. (4) Three hours of lecture per week. Physical and human geography of the sea. Ocean and island environments and ecology; ocean voyages and settlement by sea-faring societies; marine resources and environmental issues. (F) Nietschmann

*Not offered 1991-92
On leave, spring, fall
*On leave, fall
†Recipient of Distinguished Teaching Award
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. (F) Granger

136. Water Resources. (4) Three hours of lecture per week. Water use, water supply and public policy: history, institutions, current controversies. Topics include agriculture, pollution, urban water, energy. Project evaluation, pollution, environmental impacts artificial scarcity and over development. Emphasis on California.

138. Political Ecology of the Third World. (4) Three hours of lecture per week. Political factors affecting ecological configurations of the Third World. Topics include environmental degradation, migrations, agricultural production, role of international aid, divergence in standard of living, political power, participation and decision making, access to resources, global environmental policies and treaties, political strife and war. (SP) Marx

140. Analysis of Landforms. (4) Three 1½-hour lectures per week. Prerequisites: 1 or equivalent. Geomorphic processes and the origin of landforms in varying geological and climatic environments. (F) Oberlander

141. Topographic Map Analysis. (4) Two 2-hour seminars per week. Prerequisites: 1 or equivalent. The analysis of landforms portrayed by contours on the standard topographic map series published by the U.S. Geological Survey. (F) Oberlander

144. Principles of Meteorology. (4) Three hours of lecture and a 1-hour obligatory discussion per week. Weather development in relation to different scales of atmospheric circulation including analysis and forecasting with examples from the Northeastern Pacific-Western North American area. (SP) Granger

*146. Applied Physical Climatology. (4) Three hours of lecture per week. Prerequisites: 1 or equivalent. The meteorological systems: Energy and moisture balances of air masses and of river and lake basins; atmospheric interactions with plants, animals and man including agro-, hydro- and bio-climatological investigations.

*147. Climatic Change. (4) Three hours of lecture per week. Fluctuations in climate during the period of instrumental record and their societal impacts. The role of air-sea interactions, volcanic eruptions, solar variability, human activities, etc., in regional and hemispheric climate anomalies.

148. Biogeography. (4) Three hours of lecture per week. Prerequisites: 1 or a lower division course in Biology or Earth Science. Changing distribution patterns of plants and animals on a variety of spatial and temporal scales. The effects of "continental drift," Pleistocene climatic change, agricultural origins and dispersals. The ecology of invasions and extinctions. Island biogeography. (SP) Byrne

*149. Vegetation of North America. (4) Three hours of lecture per week. Prerequisites: 1 or a lower division course in Biology or Earth Science. A comparative review of vegetation changes affected areas of North America. Evaluation of the relative importance of natural and cultural disturbance. Effects of climatic change, changes in fire frequency, grazing impacts, selective cutting, habitat modifications. Preservation problems.

150. California. (4) Three hours of lecture per week. The uniqueness of California and its distinctive regions. Physical characteristics (landforms, climate, biota) of the state and principal regions. How they have been perceived and organized by its inhabitants throughout history. Current cultural and economic regions and land- (SP) Walker

*151. The American West. (4) Three hours of lecture per week. The Old West, excepting California, as a settlement and recent frontier; historical and contemporary perspectives.

*152. Historical Geography of the United States. (2) Two hours of lecture per week. The evolution of the settlement pattern, regional economies, and cultures of the United States as it is related to the spread of the human landscape and its response to varying physical conditions.

153. Geography of Canada. (4) Three hours of lecture per week. The evolution of the settlement and economic conditions of the province. Changes more generally. Attention will be paid to the relation between physical and human geography, and the development of the human landscape and its response to varying physical conditions.

154. Middle America. (4) Three hours of lecture per week. The physical and cultural geography of Mexico, Central America, and the West Indies. Emphasis is on the areas' cultural history, development and present-day ecological, demographic, and economic patterns. (SP) Jones

*155. Spanish South America. (4) Three hours of lecture per week. Environment and culture of the Andean and the Plata countries.

158. 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 regional perspective, the physical geography, climates of the region, population, culture, and social structure. (SP) Granger


161. Sierra Nevada. (4) Three hours of lecture per week. Prerequisites: Upper division standing. A geographical survey of the Sierra Nevada range of California and Nevada geology, geomorphology, climate, hydrology, snow surveying, vegetation, history of exploration and settlement, economic development, recreational use, administration of public lands.

162. Soviet Union. (4) Three hours of lecture per week. A survey of population, natural resources and the environment, historical conditions, background history, the planned economy and the political and ethnic structures, followed by an attempt to integrate these topics in the context of distinctive regions. (F) Hooson

163. Southeast Asia. (4) Three hours of lecture per week. Environment, culture, and development of mainland and insular Southeast Asia. (F) Reed

165. Africa: Ecology and Development. (4) Three hours of lecture per week. An overview of ecological issues in the development of sub-Saharan Africa. Topics include rural development, ecological change, demography, migration, urban growth, agricultural development, and peasant economy.

166. The Arid Lands. (4) Three hours of lecture per week. An overview of the environments and human activities in the arid and semi-arid regions of the world, and resulting ecological and socio-economic problems in selected areas.

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 to current social and economic problems of individual countries and the area as a whole. (SP) Oberlander


180. Field Geography. (4) One hour lecture plus nine hours (one Saturday) field work per week. A geographical survey of selected physical and cultural landscapes in the Bay Area and adjacent parts of Northern California. (F) Wells

181. Urban Field Study. (4) One hour lecture plus nine hours (one day) field work per week. Prerequisites: Introduction to the metropolitan Bay Area: its history, economy, social makeup, and physical appearance. Evolution of spatial patterns, social justice and conflict in the city, business location, real estate and housing, images and ideologies. (F) Walker

183. Cartographic Representation. (2) Two hours of lecture and six hours of laboratory per week. Problems in the representation of quantitative and qualitative data on thematic maps. (SP)

*185. Image Analysis in Geography. (4) Four hours of lecture per week. An introductory survey of current methods and techniques in the field of image analysis. (SP) Johns

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 emphasis on the 19th and 20th centuries. A survey in knowledge, relations with other disciplines, and its use and role in various countries. (F) Hooson

H195A-H195B. Honors Course. (1–4) Course may be repeated for credit. 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 passed/not passed basis. Prerequisites: Consent of instructor. Supervised experience in application of geography in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

198. Directed Group Study. (1–4) Course may be repeated for credit. One hour lecture, three to six hours of laboratory per week. Must be taken on a passed/not passed basis. Prerequisites: Senior standing. Overall GPA in major of 3.00. (F,SP)

Graduate Courses

200. First Year Graduate Seminar. (3) One 3-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Required of and limited to first-year geography graduate students. A survey of faculty research interests. (F) Staff

201. Philosophical and Methodological Issues in Remote Sensing. (4) Three hours of lecture/seminar and one hour consultation per week. An introduction to the relations between geographic theory and wider issues in the social sciences. Emphasis on the network of current human and physical geographers and related work in social theory and philosophy. (SP) Pred

202. Philosophical and Methodological Issues in Physical Geography. (4) Course may be repeated for credit. One 3-hour seminar per week. This reading and discussion seminar focuses on the relation between physical and human geography, and the prospects for a unitary discipline, the implications of environmental change both natural and man-induced. (F) Stoddart

204. Geographic Research Methods and Theories. (4) One 3-hour seminar per week. Prerequisites: Graduation standing. Analysis of geographic research methods and theories. Emphasis on field research and historical development or field-based studies in geography and related disciplines. Consideration of approaches and assumptions involved in various field research methods and theories. Research ethics, proposal and equipment. Weekly projects, assignments and discussion. (F) Nietschmann
205. History of Geography. (4) Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. A critical view of the development of geographical scholarship and its various approaches and contributions, in their historical contexts. Biographies of key personalities and the formation of schools and "circles." Recurring arenas of controversy and the principal protagonists.

206. The Regional Approach in the History of Geography. (4) Two hours seminar and one hour consultation per week. A reading course on contemporary theories of economic growth and underdevelopment in the Third World. Special topics include industrialization and capital flight to the periphery, peasant economy, agricultural policy, migration and ecological change.

213. Cultural and Human Ecology. (4) Course may be repeated for credit. Two hours seminar and one hour consultation per week. Reading course in current topics in human and cultural ecology with an emphasis on various developments in ecological anthropology, political economy, and communications theory. Special topics include adaptation and maladaptation, household reproduction, hazards research, subsistence ecology and field methods.

240. Advanced Landforms Analysis. (4) Three hours of seminar per week. Prerequisites: 140 or equivalent and methods of geomorphological analysis. (SP) Wells

242. Physiography of Western North America. (4) Three hours of seminar and one hour of consultation per week. Reading course in current topics in human and cultural ecology with an emphasis on problems of contemporary development. (F,SP) Johns, Vance.

251. Topics in Cultural Geography. (4) Course may be repeated for credit. Two hours seminar and one hour consultation per week. Research seminar on selected topics in cultural geography.

252. 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. (F) Watts

253. Topics in Urban Geography. (4) Course may be repeated for credit. Two hours seminar and one hour consultation per week. Research seminar on selected topics in urban geography. (F,SP) Johns, Vance.

255. Topics in Political Geography. (4) Course may be repeated for credit. Two hours seminar and one hour consultation per week. Research seminar on selected topics in political geography. (F) Hooson

256. Topics in Historical 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 historical geography.

257. Topics in Climatology. (4) Course may be repeated for credit. Two hours seminar and one hour consultation per week. Research seminar on selected topics in climatology.

259. 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.

260. Topics in Biogeography. (4) Course may be repeated for credit. Two hours seminar and one hour consultation per week. Research seminar on selected topics in biogeography. (F,SP) Byrne

262. Topics in Latin America. (4) Course may be repeated for credit. Two hours seminar and one hour consultation per week. Research seminar on selected topics in the geography of Latin America. (SP) Johns

263. Advanced Field Study in Geography. (3-7) Course may be repeated for credit. One hour of lecture and eleven hours of field work per week. All day Saturday. Each additional unit requires four hours of field work per week. Extended field project required. (F,SP)

265. Geography Colloquium. (1) Course may be repeated for credit. One and one-half hours per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Advancement to Ph.D. candidacy. (F,SP)

267. Directed Field Studies. (1-6) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Open to students directly engaged in field studies. (F,SP)

268. Directed Study for Graduate Students. (1-6) Course may be repeated for credit. Section 1-20 to be graded on a satisfactory/unsatisfactory basis. Section 21-41 to be graded on a letter basis. Special tutorial or seminar on selected topics not covered by available courses or seminars. (F,SP)

269. Individual Research. (1-8) Course may be repeated for credit. Individual research for graduate students in consultation with staff member. (F,SP)

601. Individual Study for Master's Students. (1-6) Units may be repeated for credit. Course may be repeated for master's degree. Individual study for comprehensive or language requirements in consultation with the field adviser. (F,SP)

602. Individual Study for Doctoral Students. (1-6) Course may be repeated for credit. May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for master's degree. Individual study for comprehensive or language requirements in consultation with the field adviser, intended to provide opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (F,SP)

Professional Courses

301. Professional Training: Teaching Practice. (1-4) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. (F,SP)


Interdepartmental Studies Courses

Upper Division Courses

*IDS 116. Pollen Analysis. (2) Three hours of laboratory per week, two full weekends, and three one-day trips for reports. Prerequisites: Must be taken in conjunction with IDS 116L. The theory of pollen analysis. Taxonomy of pollen types commonly encountered in the fossil record, with special reference to the Quaternary. The relationship between the "pollen rain" and modern vegetation. The taxonomy of pollen. Use of pollen analysis in landscape paleoecological contexts. Discussion of selected case studies. (SP) Raymond Jeanloz, Ph.D. California Institute of Technology.

*IDS 116L. Pollen Analysis Laboratory. (3) Three hours of laboratory per week plus two weekend field trips in San Diego County. Prerequisites: Must be taken in conjunction with IDS 116. An introduction to the techniques of Quaternary pollen analysis: recovery of sediment cores from lakes and peat bogs, extraction of fossil pollen from sediment cores, collection of surface samples, graphical presentation of results. Sponsoring departments: Geography and Integrative Biology.

Geology and Geophysics (College of Letters and Science)

Department Office: 301 Earth Sciences Building, 46-326.
Chair: Donald J. DePaolo, Ph.D.
Professors: Walter Alvarez, Ph.D. Princeton University; Stratigraphy, structure, tectonics, impact craters; Bruce A. Bolt, Ph.D., D.S.S. University of Sydney; Theoretical geophysics, earthquakes; George H. Brinethall, Jr., Ph.D. University of California at Berkeley; One-forming processes, geochemistry; Mark S. T. Buley, Ph.D. University of California at Los Angeles; Physics of planetary interiors.

*On leave, spring
Recalled to active service
Recipient of Distinguished Teaching Award

The Major in Earth Science

The major in earth science includes a broad spectrum of courses in natural science and is designed for students who desire a general background in the field of earth science. The upper division requirements are sufficiently flexible to serve a variety of special interests in the general field. A broad background of knowledge and experience in the study of the composition, structure and evolution of the earth. Three undergraduate degree programs are offered, each leading to the A.B. degree in the College of Letters and Science. See the section on the College of Letters and Science for the additional college requirements for graduation.
The Major in Geology

The major in geology includes basic courses in physical geology. It provides the background necessary for graduate study in geology and also satisfies the minimum academic requirement for registration as a geologist in the State of California.

Geology 10 or 50 and most other lower division requirements should be completed before declaring the major.

Lower Division Courses

Upper Division Courses
- Geology 100A, 100B, 101, 102, 131, 118 and Geophysics 108; Twelve additional units from Group A (Geology 108, 116, 124, 135, 151, 161) and Group B (Geology 107, 110, 111, 117, 162, Integrative Biology 182), with at least one course from each group.

Honors Program
- Students with an overall grade-point average of 3.5 in the University, including 3.3 in the major, may apply for admission to the honors program. Application should be made through the student's major adviser not later than the end of the student's junior year. Candidates for graduation with honors in geology are required to take six units of Geology H195.

The Major in Geophysics

The major in geophysics is designed for students with facility in mathematics and physics and an interest in geology and geodynamical processes; it provides a general background in the physical sciences, with emphasis on the physics of the earth.

Lower Division Courses
- Mathematics 1A-1B, Mathematics 50A-50B, Physics 7A-7B-7C, Chemistry 1A-1B.

Upper Division Courses

Honors Program
- Students with an overall grade-point average of 3.3 in the University, including 3.3 in the major, may apply for admission to the honors program. Application should be made through the student's major adviser not later than the end of the student's junior year. Candidates for graduation with honors in geophysics are required to take Geophysics 199 and either write a research paper or take a comprehensive examination.

The Major in Engineering Geoscience

The College of Engineering with the cooperation of the Department of Geology and Geophysics offers a curriculum in engineering geoscience leading to the degree of Bachelor of Science (see section on Engineering Science in this catalog).

Graduate Programs

The central objective of this graduate program is to encourage creative thinking and develop the capacity for independent and original research.

Student Background
- The student is expected to have a background:
  1. Two years of college mathematics including at least one year of calculus at the level of Mathematics 50A-50B; an introductory course in computer programming is recommended.
  2. One year each of college chemistry and physics at the level of Chemistry 14 and Physics 7A-7B.
  3. For geology students, broad undergraduate training in geology, including paleontology, geophysics and geochemistry.
  4. For geophysics students, additional mathematics and physics at the upper division level.

Students may be admitted with deficiencies in their prior training, but they are expected to correct these during their first year of graduate work.

Geology
- Incoming students must choose between a master's and Ph.D. program by the beginning of the first semester. A master's degree is not prerequisite to a Ph.D. degree. Students should plan to cover a broad spectrum of advanced courses, selected with the approval of the graduate adviser. Courses taken within the Department of Geology and Geophysics should include several areas of study related to the student's major research interest.

Two master's degree programs are offered. Requirements for the Master of Arts degree consist of 24 semester units of upper division and graduate courses, and a research project. A Master of Science degree is granted upon completion of 20 semester units of upper division and graduate courses and submission of a Master's thesis. The M.A. program requirements include at least 12 units in the graduate (200) series; for the M.S., at least eight units must be in the 200 series. The master's thesis should be completed within four semesters (two years).

Candidates for the Ph.D. degree must prepare and defend a research proposition at the oral qualifying examination by the end of the third semester; the student's general mastery of geology is also tested at this examination.

Geophysics
- Incoming students must choose between a master's and Ph.D. program by the beginning of the first semester.

The M.A. degree is awarded after successful completion of an oral examination to be taken no later than the fourth semester. In addition, candidates must complete 24 semester units of upper division and graduate course work, of which at least 12 must be purely graduate units.

Candidates for the Ph.D. degree must prepare and defend a research proposition at the oral qualifying examination during the third semester; the student's general mastery of geophysics is also tested at this examination. There is no formal course requirement, but students are encouraged to take graduate courses in mathematics and physical sciences as well as in earth sciences according to individual needs. The preparation of a Ph.D. dissertation requires at least a full academic year and the dissertation need not be related to the qualifying project. A master's degree is not prerequisite to a Ph.D.

Center for Isotope Geochemistry
- The Center for Isotope Geochemistry, under the directorship of Professor Donald DePaolo, consists of solid-source mass spectrometry and related laboratories on campus and facilities for stable isotope measurements and microsampling/microanalysis at Lawrence Berkeley Laboratory. Research using Nd, Sr, Pb, C, H and O isotopes is directed toward studies of geological processes and the structure and evolution of the oceans, the mantle, and the continental crust.

Seismological Stations
- The University operates 16 seismological stations in northern California to study earthquakes and volcanic phenomena in parts of Nevada and Oregon and to conduct other research in seismology. Research includes the study of earthquake wave propagation, the nature of the waves, the character of the ground, the nature of earthquake sources, eigenvalues of the earth, and the theory of the seismology. Offices are in the Earth Science Building.

Center for Computational Seismology
- The University at Lawrence Berkeley Laboratory houses a research facility for modern seismological research which relies heavily on computing analysis (e.g., imaging) or large database manipulations. The center is used in a number of Ph.D. research studies.

Geology

Lower Division Courses
- 10. Understanding the Earth. (3) No credit for students who have taken 50. Two 1½-hour lectures and one 2-hour discussion per week. This course provides an overview of the materials that make up the Earth, the processes that change them, the organization of these processes into an Earth system, and the history that has developed as the Earth system has changed over time. (SP) Alvarez

50. Introduction to Geology. (3) Two 1½-hour lectures per week. Prerequisites: 50, must be taken concurrently, except by declared Geology majors. An introduction to the physical and chemical processes that have shaped the earth through time, with emphasis on the history of plate tectonics. (F) Richards

50L. Introductory Geology Laboratory. (1) Three hours of laboratory per week. Prerequisites: To be taken concurrently with 50, except by declared Geology majors. Practical study of minerals, rocks and geologic maps. Exercises on geological processes. (F) Richards

Upper Division Courses
- 100A. Introduction to Minerals. (2) Two 1-hour lectures and two 3-hour laboratories for first 7½ weeks: mini-course. Prerequisites: 50 and Chemistry 1A or equivalent. Inorganic crystal chemistry; classification and physical properties of common minerals; identification in hand specimens. (F)

100B. Introduction to Rocks. (2) Two 1-hour lectures and two 3-hour laboratories for last 7½ weeks: mini-course. Prerequisites: 100A or consent of instructor. Introduction to the origin of igneous, sedimentary and metamorphic rocks; identification of rocks by macroscopic and microscopic properties. (F)

101. Field Geology. (3) One hour of lecture and two 3-hour field trips per week. Prerequisites: 100A and 100B. Inorganic crystal chemistry, classification and physical properties of common minerals; identification in hand specimens. (SP)

102. Optical Properties of Minerals and Rocks. (2) One hour lecture and one 3-hour laboratory per week. Prerequisites: Chemistry 1A, 100A-100B which may be taken concurrently. Study of minerals and rocks in thin sections with the petrographic microscope. (F) Bukowski

*106. Ore Deposits. (4) Two 1½ hours of lecture, and three hours of laboratory per week, and two field trips. Prerequisites: 100A-100B, Chemistry 1A-1B. Origin of the chemical elements, fractionalization, crystal abundance patterns, systematics and evolution of super crustal ore-forming environments. Mass balance and principles of solute transport by fluids in the earth. Brimhall

*107. Plate Tectonics. (4) Two 2-hour lectures and one hour of discussion per week. Prerequisites: Mathematics 50A-50B; Physics 7A-7B; senior standing in Geology, Geophysics, or related field. Geometry of plate motions; applications of seismology, gravity, magnetism, and heat flow to plate tectonics; geological processes at plate margins; evolution of mountain belts; driving mechanism for plate tectonics; interaction of sea processes with tectonics.

*110. Tectonic Evolution of Western North America. (3) Two 1-hour lectures per week and one 4-hour 2-day field trip. Prerequisites: 50, 100A and 100B. Principles of regional stratigraphy, structural and tectonic analysis, based on plate tectonic theory. Emphasis is placed on examples from Nevada and California; includes analyses of rifted margins; miogeoclinal development; obducted oceanic assemblages; accreted arc terranes; Mesozoic subduction complexes and related plutonic rocks; transform faults and Cenozoic continental disruption. Jones

111. Petroleum Geology. (3) Two 1½-hour lectures and one hour of discussion/laboratory per week. Prerequisites: Introductory course in Geology, Basin de-
velopment related to plate tectonics. Origin of petro-
leum: quality, quantity, thermal maturation of organic
matter in source rock. Primary and secondary migra-
tion. Reservoir evaluation. Reservoir rock: struc-
ture and geometry. Traps: structural, stratigraphic or
combination. Reservoir fluids and energy. Oil
provinces, individual fields. (SP) Alexander

*116. Structural Geology. (4) Two 1½-hour lectures and
one 3-hour laboratory per week. Prerequisites: 102,
and consent of instructor. Introduction to struc-
tural geology. Graphic methods in elementary struc-
tural geology: spherical projections; orthogonal
projection; structure contours; cross sections, profiles
and block diagrams. Introduction to theories of stress
and strain and the origin of common structures in deformed
rocks.

117. Geomorphology. (4) Three hours of lecture and
one 3-hour laboratory per week, plus weekend field
trips. Prerequisites: 50 or consent of instructor. Quan-
titative examination of landforms, runoff generation,
weathering, mechanisms of soil erosion by water and
wind, mass wasting, glacial and periglacial processes
and hillslope evolution. (F) Dietrich

118. Summer Field Course. (6) Six weeks in the
field without a break. Prerequisites: 50, 100A, 100B,
101, and consent of instructor. Introduction to geol-
ogy and concepts of geologic time. Student field
trips. 119 is strongly recommended. Six weeks of
intensive geological field work, including preparation
of final report. (Extra Session) (F,SP) Jones, Wenk

124. Isotope Geology. (3) Two 1-hour lectures and
one 3-hour laboratory per week. Prerequisites: 100A
or 100B or equivalent and Chemistry 1A-1B. Methods
of dating rocks using radioactive isotopes; the use of
stable isotopes in solving geological problems
(SP) Kennedy

131. Introduction to Theoretical Geochemistry. (4)
Three hours of lecture and three hours of laboratory
per week. Prerequisites: Chemistry 1A-1B, 100A
and 100B, or consent of instructor. Chemical thermody-
namics in solution chemistry in a geologic context. (SP)
Helgeson

135. Mineralogy-Crystallography. (4) One 2-hour
lecture, one 3-hour laboratory and one hour individual
of discussion per week. Prerequisites: 100A or con-
sent of instructor. Symmetry and structure of minerals
as they pertain to mineral identification and other clas-
sificatory techniques. Discussion of defects which are
produced during phase transformations and defor-
mation. The laboratory introduces X-ray diffraction
used for mineral identification and to localities of
geochemical interest. (F,SP) Jones, Wenk

139. Petrolaeum Composition. Reservoir: stratig-
ographic depositional setting including source rocks
and the dynamic processes of the earth. Examples are
taken from tectonics, mechanics of earthquakes, earth-
quake hazard and risk. (F) McEvilly

Geophysics

Lower Division Courses

20. Earthquakes. (3) Three hours of lecture and one
hour of discussion per week. Introduction to earth-
quakes, their causes and effects. General discussion
of basic principles and methods of seismology and
geological tectonics, distribution of earthquakes in space
and time, mechanics of earth as a source of earth-
quakes, and earthquake hazard and risk. (F) McEvilly

Three 1-hour lectures and one hour of computer lab-
oration per week. Prerequisites: Mathematics 104A-
104B. Linear inverse problems in the earth sciences;
least squares; the generalized inverse matrix and Ma-
grange constraints; splines; probability and scientific
inference; regression analysis; time-series analysis; sphe-
rical harmonics; fast-Fourier transformations; dif-
ferential equations of geophysics. (F) Boit

108. Geodynamics. (4) Three 1-hour lectures and
one hour of discussion per week. Prerequisites:
Physics 7A, Mathematics 50A-50B. Basic principles
of dynamical processes of earth materials and the
dynamic processes of the earth. Examples are
taken from tectonics, mechanics of earthquakes, etc.,
to augment course material. (SP) Richards

121. Seismology. (4) Two 1-hour lectures and two 3-
hour laboratories per week. Prerequisites: 108, or
course in continuum mechanics; Physics 7A-7B; Mathe-
ematics 50A-50B. Formerly 121A-121B. Elastic waves
in the earth; forward and inverse problems for the ve-
forces in minerals, including simple models and the results of rigorous calculations from quantum mechanics; spectroscopic data, group-theoretical analyses, and crystal field theory; equations of state and high-pressure phenomena. Bukowinski

"217. Advanced Seismology. (3) Two 1-hour lectures and one 3-hour laboratory per week. Theory of the pendulum and other seismographs. Techniques of modern seismometry, including signal conditioning and data acquisition systems. Laboratory exercises stress mechanical details and signal flow consideration in seismograph design and calibration.

218. Seminar in Seismology. (3) Course may be repeated for credit. One 3-hour discussion period per week. Critical study of problems in current seismological research. Topics will vary from semester to semester. (F,SP) Johnson, Romanowicz

219. Seminar in Geophysics. (3) May be repeated for credit. One 3-hour discussion per week. Critical study of problems in current geophysical research. Content will vary. (SP) Bukowinski, Jones, Wang

220. Advanced Concepts in Mineral Physics. (3) Course may be repeated for credit. On 3-hour lecture per week. Prerequisites: Consent of instructor. A combined seminar and lecture course covering advanced topics related to mineral physics. The interface between geophysics with the other physical sciences is emphasized. Topics vary each semester. (F,SP) Jeanloz

225. Topics in High-Pressure Research. (2) Course may be repeated for credit. One 2-hour lecture per week. Prerequisites: Consent of instructor; Analysis of current developments and techniques in experimental and theoretical high-pressure research, with applications in the physical sciences. Topics vary each semester. (F,SP) Jeanloz

285. Research. (2-12) Course may be repeated for credit. Individual conferences to be arranged. Provides supervision in the preparation of an original research paper or dissertation. (F,SP) Staff

298. Directed Group Study for Graduate Students. (1-9) Course may be repeated for credit. Occasional group meetings and individual conferences. Section 1 must be taken on a satisfactory/unsatisfactory basis; other sections may be taken on a letter basis. (F,SP) Staff

601. Individual Study for Master's Students. (1-8) Units may not be used to meet either unit or residence requirements for a master's degree. Course may be repeated for credit. Individual conferences. Must be taken in consultation with the field adviser. Prerequisites: For candidates for master's degree. Individual study for the comprehensive or language requirements in consultation with the field adviser. (F,SP) Staff

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

Professional Courses

404. Modern Seismological Observatory Techniques. (2) Course may be repeated for credit. Two or three hours of laboratory plus one hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 204 and graduate standing. Advanced instruction in interpretation and reduction making use of the instrumental and computer aspects of the seismograph. The purpose is to enable graduate students to use analog and digital observations of seismic waves in their research. (F,SP) Bolt, McEvilly
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.

Any course in the 195 series and an honors thesis (H198) must be completed. 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), as follows:

Required: One course on German culture and institutions (German 110, 111, 112, or 158).

Electives: Four upper division courses (excluding courses in English translation); only 2 units from German literature may be applied to the minor. One course from another department related to German studies, or a course in Dutch or Yiddish from the German Department, may be counted as one of the four electives with prior approval of the minor adviser.

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 is required for admission to either the literature or the linguistics option.

1. Literature Option: The program is designed to provide students with a comprehensive knowledge of the major periods and works of German literature. Students have to complete at least 37 units, 28 of which must be in graduate courses. The Proseminar (200), Middle High German (203), and at least one seminar in literature and one course in linguistics are required. Students are granted the degree upon passing either a written or an oral examination.

2. Linguistics Option: The program offers a broad range of courses in contemporary and historical language and the methods of German and Germanic linguistic, including recent directions in such areas as discourse grammar, linguistic field work, and semiotics. Students have to complete at least 37 units, 28 of which must be in graduate courses. A knowledge of Middle High German as well as proficiency in oral and written New High German are required. Students are granted the degree upon passing a written examination.

For more detailed information on the M.A. program in literature and linguistics, students should consult the German Department's "Graduate Student Information Sheet."

The Ph.D. Program: The German Department offers a Ph.D. in both German literature and German linguistics.

1. Doctor of Philosophy: Literature. An M.A. or its equivalent is a prerequisite for admission. Students pursue an individualized program. By the end of the third semester of Ph.D. work, students are expected to develop a prospectus that argues a particular issue, perspective, or critical approach and involves major texts and periods of German literature from the Middle Ages to the present. The qualifying examination, based on this prospectus, consists of both written and oral aspects. Students must also acquire competence in an outside field complementary to the major field of concentration in German literature; the outside field is tested in the oral examination. Language requirements: a reading knowledge of two foreign languages other than German or native fluency 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 concentrate on contemporary or historical German language. They are expected, however, to be knowledgeable in all periods of the history of the German language as well as in all components of its grammar. As part of their training, students are encouraged to participate in public lecture forums, both on and off campus, and to learn to write publishable papers. Language requirements: a reading knowledge of two foreign languages other than German or native fluency in one foreign language other than German.

For more detailed information on the Ph.D. program in literature and linguistics, students should consult the German Department's "Graduate Student Information Sheet."

Dutch Studies

A description of the group major in Dutch studies can be found in the Dutch Studies section of the catalog. Descriptions of the courses presenting the languages, literature, history, and culture of the Netherlands, offered by the Department of German, follow the German courses.

German

Lower Division Courses

German 25 is strongly recommended as a complement to all lower division language courses.

1. Elementary German. (5) Five 1-hour class meetings per week and laboratory practice. Beginner's course. (F,SP) Staff

1G. Elementary German for Graduate Students. Five 1-hour lectures/discriminations per week. Must be taken on a satisfactory/unsatisfactory basis. Elementary German for graduate students preparing for reading examinations. (F,SP) Staff

2. Elementary German. (5) Five 1-hour class meetings per week and laboratory practice. Prerequisites: 1 or equivalent. Elementary German. (F,SP) Staff

2G. Elementary German for Graduate Students. Five 1-hour lectures/discriminations per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 1 or equivalent. Elementary German for graduate students preparing for reading examinations. (F,SP) Staff

3. Intermediate German. (5) Five 1-hour class meetings per week and laboratory practice. Prerequisites: or equivalent. Intermediate German. (F,SP) Staff

3C. Intermediate Conversational German. (3) Three 1-hour class meetings per week. Prerequisites: 2 or equivalent. Intermediate German. (F,SP) Staff

3S. Intermediate Scientific German. (3) Three 1-hour class meetings per week. Prerequisites: 2 or equivalent. Designed to improve the comprehension and speaking ability and involve a general overview of grammar. This course is not necessarily adequate preparation for German 4. (F,SP) Staff

3T. Intermediate Technical German. (3) Three 1-hour class meetings per week. Prerequisites: 2 or equivalent. Designed to improve the reading competence of students in the natural and social sciences. (F,SP) Staff

4. Advanced German. (5) Five 1-hour class meetings per week. Prerequisites: 3 or equivalent. Grammar review and selected reading in literature. (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 production of German 4. Discussion of postwar drama and dramaturgy, including the production of a major play, with instruction, readings and performance in German. (SP) Staff

25. Patterns and Images of Contemporary German Culture and Society. (2) May be repeated for credit when topic changes. Two hours of lecture per week. The course is designed to complement the German language training program with a lecture series stressing interdisciplinary perspectives of Post World War II cultural developments in Central Europe. Lecture material to be supplemented with films and videotapes and guest lectures on occasion. (F,SP) Tubač

45. Freshman Seminar. (3) The course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. Limited enrollment. Variable topic. All readings in English. (F,SP) Goldstein; Kaes, Milek

Upper Division Courses

Prerequisite: Unless otherwise stated, four lower division German language courses (20 units) or their equivalent.

100. Introduction to German Literature. (3) Three hours of lecture/discussion per week. The course is intended to acquaint students with basic literary genres and major figures in German literature from the eighteenth century to the present, and to familiarize them with literary methodologies and critical tools. Required of all German majors. (F,SP) Holub, Weisinger; Spahr, Tubač

Dutch/Linguistics

Upper Division Courses

101A-101B. Advanced German Grammar and Composition. (3:3) Three hours of lecture/discussion per week. Prerequisites: 4 or consent of instructor. The purpose of this course is to improve the reading and speaking skills of students in their third year of German studies. Emphasis on correct use of the German language. Systematic review of German grammar. Weekly written assignments. No midterm or final examination. Required of all majors. Not open to native speakers. (F,SP) Staff

102. German Conversation. Either 102A or 102B may be repeated for credit, but only 4 units may be applied toward the major. Three hours of lecture/discussion per week. (F,SP) Staff

102A. Intermediate German Conversation. (2) Prerequisites: 4 or consent of instructor. This course is designed to perfect oral proficiency in German. Discussion of current events affecting Germany and the US, analysis of culturally significant texts. Students are expected to make several oral presentations. (F,SP) Staff

102B. Advanced German Conversation. (2) Either 102A or 102B may be repeated for credit, but only 4 units may be applied toward the major. Prerequisites: 102A or consent of instructor. This course is designed to perfect oral proficiency in German. Discussion of current events affecting Germany and the US, analysis of culturally significant texts. Participants are expected to make several oral presentations. (F,SP) Staff

102C. Topical German Conversation. (2) Prerequisites: 102A, 102B or consent of instructor. This course is designed primarily for students in the social sciences who want to practice their German by discussing current political and social issues. Emphasis will be placed on the ongoing debate on national identity, nationalism and European integration as it is affected by the dramatic changes in Germany. Reading will include articles by T.W. Adorno, M. Horkheimer, L. Lowenthal, W. Benjamin, J. Habermas, H. Arendt and A. Mitscherlich. (F,SP) Funkie

103. The Structure of Modern German. (3) Three hours of lecture per week. Prerequisite: Emphasis on the structure of modern German for undergraduates, covering the fundamentals of German phonetics and phonology, morphology and syntax. (F) Painter
104. Introduction to the Linguistic Study of German. (3) Three hours of lecture 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 a discussion of the modern dialects. (SP, Painter)

*105. Middle High German for Undergraduates. (3) Not open to graduate students for credit. Three hours of lecture, translation and discussion per week. Students will learn the fundamentals of Middle High German grammar and will read selections from major narrative works of the Hohenstaufen period.

*106. Readings in Middle High German. (3) May not be substituted for but may be taken concurrently with 203. Three hours of lecture/discussion per week. Prerequisites: 105, or equivalent. Reading course designed to increase student's Middle High German repertoire.

*108. Literary Translation. (3) Three hours of lecture/discussion per week. Prerequisites: Two upper division courses in German literature. This course introduces students to the problems of literary translation from German to English.

Cultural History

Upper Division Courses

*110. From 800-1648. (3) Three hours of lecture per week. The social, political, and historical background to Medieval literature from the Age of Charlemagne to the Empire of Charles V. (SP, Tennant)

*111. From 1500-1800. (3) Three hours of lecture/discussion per week. The social, political, and historical background to German literature from the Reformation to the Age of Reason.

*112. From 1800 to the Present. (3) Three hours of lecture/discussion per week. The social, political, and historical background to German literature since the French Revolution.

Literary History

Upper Division Courses

120. 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. (SP, Tennant)

121. Renaissance, Reformation, and Baroque. (3) Three hours of lecture/discussion per week. Major works and their works from the 15th through the 17th century.

122. Enlightenment and Sturm und Drang. (3) Three hours of lecture/discussion per week. The period that gave rise to Classicism and modern German literature. Drarras (especially Lessing), novels, poetry and philosophical and political texts in their historical settings.

123. Classicism. (3) Three hours of lecture/discussion per week. 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.

124. Romanticism. (3) Three hours of lecture/discussion per week. Literature, philosophy and aesthetics of the Romantic period.

125. 19th Century Literature. (3) Three hours of lecture per week. Major trends and problems in 19th century German literature.

126. Modern Literature. (3) Three hours of lecture/discussion per week. Introduction to philosophical, ideological and aesthetic trends at the turn of the century. Analyses of literary texts by Th. Mann, F. Kafka, S. George, R.M. Rilke, G. Benn, B. Brecht.

127. Contemporary Trends. Three hours of lecture/discussion per week. (F, SP)

Approaches to Literature

Upper Division Courses

131. Philosophical Approaches to Literature. Three hours of lecture/discussion per week. Prerequisites: 100.

131A. Philosophy and Literary of the Romantic Period. (3) Three hours of lecture/discussion per week. Prerequisites: 100. Kant, Fichte, Schelling, Hegel, and works by Novalis, F. Schlegel, and Die Nachtwatchen von Bonaventure.

133. Sociological Approaches to Literature. Course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisites: 100.

133A. Das Burgerlische Trauerspiel. Prerequisites: 100. Middle-class tragedy of the 18th and 19th centuries and its theory in terms of the relationships between literature and society: patriarchy, class ideology, political significance.

133B. German Literature and the French Revolution. (3) This course will reflect recent attempts to redefine the traditional periods 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 charged reception of German Classicism in the nineteenth century, and at the nineteenth-century and a twentieth-century literary confrontation with the Revolution (Buchner, Weiss). (SP, Wilson)

135. Psychological Approaches to Literature. (3) Three hours of lecture/discussion per week. Prerequisites: 100. For specific topic contact department.

135A. Writing and Silence. Three hours of lecture/discussion per week. Based on texts by Robert Walser. This course will focus on various modes of creating and negating meaning.

Authors

Upper Division Courses

139. Lessing. (3) Three hours of lecture/discussion per week. Formerly 148. A study of his contribution as playwright, theorist, and philosopher. An introduction to 18th-century trends in philosophy and literary theory will precede the analyses of selected texts.

140. Goethe. (3) Three hours of lecture/discussion per week. An introduction to Goethe's prose, drama, and poetry. (SP, Weisinger)

141. Schiller. (3) Three hours of lecture/discussion per week. (F,SP)

141A. A Study of Schiller's Major Dramas. (3) Three hours of lecture/discussion per week. Some attention given to dramatic theory, prose and poetry. (SP, Weisinger)

142. Heine. (3) Three hours of lecture/discussion per week. Study of Heine's prose and poetry. (SP, Goldstein)

144. Franz Kafka. (3) Three hours of lecture/discussion per week. Formerly 149. 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. (SP, Goldstein)

146. Thomas Mann, Franz Kafka, Hermann Hesse. (3) Three hours of lecture/discussion per week. Formerly 144. An introduction to three internationally renowned German writers of the 20th century, with particular emphasis on their distinctly different persons, their common concerns but different attitudes to and resolutions of life's problems, and their different approaches to expression.

147. Thomas Mann. (3) Three hours of lecture/discussion per week. Formerly 145. This course will dwell primarily upon the short stories and novellas that Mann wrote before the First World War. Attention is given to Mann's evolving mode of narration, and to the interlaced personal nature of the matter of his tales. (F, Mileck)

148. Stefan George and Rainer Maria Rilke. (3) Three hours of lecture/discussion per week. Formerly 146. Introduction to philosophical, ideological and aesthetic trends at the turn of the century; analysis of lyrical texts from 1890-1920. (F,SP)

149. Brecht. (3) Three hours of lecture/discussion per week. Formerly German 147. An introduction to Brecht's work.

Special Topics

Upper Division Courses

150. Literature of the German Democratic Republic. (3) Three hours of lecture/discussion per week. An introduction to the major writers of prose and drama.

151. Austrian Literature. (3) Three hours of lecture/discussion per week. Formerly 149. This course will focus on literature, psychology, and philosophy of the turn of the century. (F, Goldstein)

153. Feminist Perspectives in Literature. (3) Course may be repeated. Three hours of lecture/discussion per week. Formerly 144. An introduction to the major writers of prose and drama. Texts and instruction in English. Does not count toward the Major/Minor unless prior arrangement is made with the Major/Minor Advisor and the instructor. For specific topic contact departmental office. (SP, Staff)

154. Jewish Writers and Thinkers in the German-Speaking World. (3) Three hours of lecture/discussion per week. This course will explore attempts of German-speaking Jews to try to come to terms with the dominance of German (or Austrian) European culture during the period extending from their emancipation from the ghetto in the 18th century to their expulsion or ex-termination in the Nazi era. The course will examine the way Jewish writers related to Jewish identity and nationality and try to understand them in their socio-historical, cultural perspective and also as literary or aesthetic documents.

155. Studies in Poetry. (3) Three hours of lecture/discussion per week. Topic varies from year to year. (F,SP)

155A. 18th to 20th Century German Poetry. (3) Course may be repeated when topic changes. Three hours of lecture/discussion per week. Representative texts from 18th and 20th century German poetry will be studied closely. Methodological questions regarding the interpretation of poetry in general will also be discussed.

156. Studies in Prose. Three hours of lecture per week. Topic varies from year to year. (F,SP)

156A. Experimental Contemporary Prose. (3) Experimental Contemporary Prose.

157. Studies in Drama. (3) Three hours of lecture/discussion per week. (F,SP)

157A. German Drama from the Forties to the Seventies. This course will focus on major dramatic trends. Attention will be drawn to the dramatic theories underlying Epic Theatre, Expressionist Theatre, Theatre of the Absurd, Documentary Theatre, and
Neo-Naturalism. Representative dramas by major playwrights will be studied both in terms of matter and manner.

158. 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 but particularly intended for students who will participate in the EAP to Gottingen in the following year. (F. Funke)

160. Issues and Problems in German Literary and Cultural History. (3) Course may be repeated for credit. Three hours of lecture/discussion per week. Texts and instruction in English. Does not count toward the Major/Minor unless prior arrangement is made with the Major/Minor Advisor and the instructor. Variable topic. For specific topic contact departmental office. (F. SP) Goldstein, Holub

164. German Cinema. Three hours of lecture and two hours of film screening per week. Films have English subtitles. Texts and instruction in English. Does not count toward the Major/Minor unless prior arrangement is made with the Major/Minor Advisor and the instructor. (F. SP)

*164A. From Expressionism to Social Realism: German Filmmakers, (4) 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 the film in general. We will closely analyze the major films of the period and pay particular attention to Weimar culture and society. (F. SP) Herzog, Fassbinder, Wenders, Syberberg, Schlorndorf

*164B. Film of the Third Reich. (4) 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 "semiotics" of fascist art. We will examine the social context of film art in the Third Reich and analyze how German postwar films have depicted the Hitler period.

164C. New German Cinema: German Film After 1932. (4) This course will examine selected films by Straub, Herzog, Fassbinder, Wenders, Syberberg, Schlorndorf 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.

164D. German Cinema. (4) The course will deal with the topic from various angles: a representative selection of American film noir from the United States and some films (as forerunners) from the Weimar Republic will be shown and discussed in terms of their visual and narrative virtues; there will also be literary texts and cultural documents (articles on crime in the United States; on the working conditions in Hollywood) pertaining to the topic. (SP) Kees

*165. Introduction to German Area Studies. (3) Three hours of lecture/discussion per week. Prerequisites: 1.6, 2.4. or equivalent. Following the survey of various contemporary theories in culture studies, the course will provide a broad introduction to four key approaches to post-war West Germany: 1) post-WWII sociopolitical history; 2) Jewish identity and Neo-Naturalism; 4) fine arts and aesthetics. The individual approaches will be illustrated within the context of specific and signal events of post-war social and cultural developments.

Seminars and Special Study

Upper Division Courses

175. Undergraduate Seminars. Three hours of seminar per week. Prerequisites: 100. Formerly 130. (F. SP)

*175A. Franz Kafka. (3) Three hours of seminar per week. Formerly 130A. The seminar will explore Kafka's short prose and his novels. We will consider the symbolic and metaphorical systems of his protagonists, the enigmatic world they try to inhabit, and the various ways in which their stories are presented in literary prose.

*175B. 20th Century Poetry. (3) Three hours of seminar per week. Analysis of various poetry from the beginning of the century to today, including works by Trakl, Benn, Bachmann, Sacher-Masoch, and Brinkmann. A 20-page research paper will be part of the requirements for this course.

195. Research Seminars for Undergraduates. (3) Course may be repeated for credit. Three hours of seminar per week. One course offered under this topic each term; students participating in the departmental Honors Program. Variable topic. For specific topic contact departmental office. (F. SP) Tannent

H169. Honors Studies in German. (2-4) Prerequisites: One of the 195 courses. Supervised independent study and research course for honors students who are writing 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. Seminar. Must be taken on a passed/not passed basis. Group study of selected topics which will vary from year to year. (F. SP) Staff

199. Supervised Independent Study and Research. (2-4) Individual course. 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 plus one hour of tutorial per week. The seminar will give a brief introduction to the history of Germanistik, draw attention to bibliographic and research tools, dwell on problems relating to critical editions of modern authors, familiarize students with current literary and cultural currents, and focus upon literary theory. Required of all M.A. candidates.

201. Major Periods in German Literature. Three hours of lecture/discussion per week. Designed expressly for M.A. candidates. Final exam, no paper. (F. SP)

*201A. Literature of the Middle Ages. (4) Survey of medieval German literature that concentrates on monuments of the Hohenstaufen period but also includes representative works from the later 13th, 14th and 15th centuries. Intended for M.A. candidates but open to all students with a working knowledge of Middle High German.

*201B. 16th and 17th Century. (4) Recommended for M.A. candidates.

201C. 18th Century. (4) Three hours of lecture per week. An introduction to major works of late Enlightenment, Sturm and Drang, and Classicism to Schiller's death. (SP) Wilson

*201D. 19th Century. (4) Three hours of lecture per week. A study of major texts from Goethe to Fontane to explore the changing functions of literature, its ideological implications and social significance within 19th century German thought.

*201E. 20th Century. (4) Three hours of lecture per week. A critical overview of the major literary and intellectual currents of the 20th century 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 nature of social function of literature in Expressionism, Dada, Fascism and Exile, after 1945 and in post-modernism.

202. Written and Spoken German for Graduates. (4) Two hours of lecture/discussion plus one hour tutorial per week. Intensive practice in German style to increase writing, speaking, and reading proficiency. Conducted entirely in German. Recommended for all students whose first language is not German. (SP) Kramsch

203. Middle High German for Graduates. (4) Four hours of lecture/discussion per week. Basic grammar, readings, techniques of editing MHG texts, elementary paleography, and normalization. Not a continuation of 106. (F. SP) Spahr

204. Literature in Language Teaching. (4) Three hours of lecture/discussion per week. Prerequisites: Permission of instructor. Will explore the uses of literature in both fictional and pedagogical contexts to enhance language learners to all aspects of language in discourse. Topics will include: text and discourse, the nature of literary discourse, text types, reading/writing and the acquisition of literacy in a foreign language, writer/reader relationship, the difficulties of the non-native reader, literature and cultural understanding.

Literary History

*205. Studies in Medieval Literature. (4) Two hours of seminar plus one hour tutorial per week. Prerequisites: 106 or 203. 1990-91 topic: Self-Referentiality and Society: Poetry from 1200-1450 (Walther von der Vogelweide to Oswald von Wolkenstein).

206. Studies in Renaissance and Reformation. (4) Two hours of seminar per week. (F. SP)

*206A. Literature of the 16th Century. (4) Three hours of lecture/discussion per week. Survey of monuments and literati between the 15th and 16th centuries. Particular attention is given to Northern Humanism and the Reformation: A good reading knowledge of Middle High German is recommended.

208. Studies in the 17th Century. (4) Two hours of seminar per week. Formerly 2020. 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. (SP) Spahr

*210. Studies in the 18th Century. Two hours of seminar plus one hour tutorial per week. Formerly 211A

*210A. Age of Enlightenment. (4) Formerly 211A. Literary texts will be studied as historical documents illustrating the cultural, intellectual, and political atmosphere of the Enlightenment. The emphasis will be on the uses of literature discussed in the wider question of oppositionality in literature.

212. Studies in the 19th Century. Two hours of seminar plus one hour tutorial per week. (F. SP)

*212A. Topics in Romanticism. (4) Course may be repeated for credit. Formerly 265. Major authors and texts of the romantic period will be discussed.

*212C. German Realism. (4) Formerly 212C. This course will focus on the major novels and novellas of 19th-century realism.

*212D. Naturalism. (4) Formerly 212D. The main works of German Naturalism - the major attention to Gerhart Hauptmann and the German drama - will be read. Some attention will also be given to foreign models (French, Russian, and Scandinavian) and to naturalism as a theory.

*214. Studies in the 20th Century. (4) Course may be repeated when topic changes. Two hours of seminar per week. Formerly 218.

Genre

*220. Bildungsroman. (4) Three hours of seminar per week.

226. Drama of the Twentieth Century. Three hours of seminar per week. (F. SP)

*226A. From Hauptmann and Naturalism to Kroetz and Neo-Naturalism. (4) Three hours of seminar per week. Attention will be drawn to the dramatic theories underlying Naturalism, Expressionism, Epic Theatre,
Theatre of the Absurd, Documentary Theatre, and Metatheatre, and to the characteristic concerns and formal features of these trends. Representative dramas by major playwrights will be studied both in terms of substance and form.

228. 20th Century Novel. (4) Two hours of seminar plus one hour of tutorial per week. A study of the major contemporary German novelists.

Authors


234. Goethe. Three hours of seminar per week. (F, SP)

*234A. Early Goethe. (4) Three hours of seminar per week. 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.

*234B. Goethe's Faust II. (4) Three hours of seminar per week. This and other works of Goethe's later period will be read and discussed in the light of contemporary criticism and literary theory.

236. Schiller. (4) Three hours of seminar per week. Plays and aesthetic works of Schiller will be read and discussed. Emphasis on the historical and dramatic problems of the works.

238. Hölderlin. (4) Two hours of seminar per week. Formerly 255A.

249. Franz Kafka. (4) Three hours of seminar per week. With emphasis upon both matter and manner, and their evolution.

250. Thomas Mann, Franz Kafka, and Hermann Hesse. (4) Three hours of seminar per week. A comparative study of some of the major shorter tales, with emphasis upon both matter and manner. (F)

240. Heinrich von Kleist. (4) Three hours of seminar per week. A study of Kleist's dramas with emphasis on problems of non-narrative language and aesthetic representation within Kleist's concept of "Gebrechlichkeit der Welt."

241. Heinrich Heine. (4) Three hours of seminar per week. A study of Heine's works in their political and social contexts. (SP)

242. Hofmannsthal. (4) Three hours of seminar per week. (F)

247. Hermann Hesse. (4) Three hours of seminar per week. A study of Hesse's novels from Peter Camenzind to Das Glasperlenspiel in terms of both matter and manner, and their evolution.

248. Thomas Mann. (4) Three hours of seminar per week. A study of Mann's novels and short stories with emphasis upon both matter and manner, and their evolution.

249. Franz Kafka. (4) Three hours of seminar per week.

250. Thomas Mann, Franz Kafka, and Hermann Hesse. (4) Three hours of seminar per week. A comparative study of some of the major shorter tales, with emphasis upon both matter and manner. (F) Mickle

251. Georg Trakl. (4) Two hours of seminar per week. Formerly 255B.

252. Nietzsche. (4) Three hours of seminar per week. The aim of the course is to explore a few 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. (SP)

Theory

255. Interpretation and Criticism of Poetry. Three hours of seminar per week. A. Hölderlin. (F)

256. Problems of Literary Theory. (4) Course may be repeated for credit. Two hours of seminar plus one hour of tutorial per week. Topics vary from year to year. For current topic see the department's "Course Descriptions" booklet.

257. Historiography. (4) Three hours of seminar per week. A discussion of the relationship of history and literature as it affects the theoretical notion of the historicity of literature and the fictionality of historiography.

258. Language Teaching as Social Interaction. (4) Three hours of lecture per week. Application of insights from psycholinguistics, sociolinguistics, discourse analysis and cultural studies on the processes of language. The methods of language acquisition in instruction and the development of oral language skills. Readings in research on historical and instructional L2-discourse. (F) Kramsch

259. Postmodernism. (4) Two hours of seminar and one hour of tutorial per week. This seminar will explore the notion of "postmodernity" in its theoretical, historical, and interdisciplinary dimensions. Specifically we will (1) analyze recent German prose writings, films, and theatre and the German contributions in the larger context of European and American debates about postmodernism, and (3) focus our attention on recent "postmodernist" re-formulations of questions of history, myth, irrationalism, and of writing, reading and representation.

260. Literary Canon and Institutional History. (4) Three hours of seminar per week. A critical discussion of the canonization of classical texts in the institutional history of literary Bildung. (SP) Holub

261. Myth and Metaphor: Patterns of Imagistic Thought. (4) Two hours of seminar plus one hour of tutorial per week. Discussion of the metaphor and metonymy in the works of Friedrich Schlegel to Hans Blumenberg and of the role of mythical patterns in literature. (SP) Seeba

262. Aesthetic Theory. (4) Two hours of seminar plus one hour tutorial per week. This seminar will explore various aspects of aesthetic theory, concentrating on Kant's Critique of the Aesthetic and Hegel's analysis of the Gesamtkunstwerk. Special attention will be given to the ideological function of aesthetic theory.

263. Studies in Language. Three hours of seminar per week. (F, SP)

263A. The Process of Translating. (4) Three hours of seminar per week. Questions of interpretation, writing and intertextuality will be explored in connection with translating a 20th century literary work.

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. The literature will be from the 19th century and be the focus of attention. A forty-minute oral presentation and a substantial research paper will be among the requirements of the course.

265. Film Theory: Historical and Systematic Perspectives. (4) Two hours of lecture/discussion plus one hour of tutorial per week. Prerequisites: 200 or equivalent. (SP) Kaiser

266. 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.

267. The Faust-Legend. (4) Two hours of seminar plus one hour tutorial. Texts and contents of the Faust-legend from the 16th to the 20th centuries.

Graduate Courses in Linguistics

270. Introduction to the History of the German Language. (4) Three hours of seminar per week. The evolution and development of the German language from prehistoric times to the present. Fundamental linguistic principles and societal movements integral to the various stages of German. (F) Rauch

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 language theory and reconstruction.

272. English. (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. (SP) 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 language of the High German language from the eighth to the eleventh century within the framework of current linguistic method.

278. History of the Dutch Language. (4) Two hours of lecture and one hour of tutorial per week. The prehistory, emergence, development of Netherlandic, and its fusion with English and German. See also Dutch 107.

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 ethnohistorical setting of the Heilige and its shared isogrammar. (SP) Rauch

285. Approaches and Issues in the Study of Modern German. (4) Two hours of seminar plus one hour tutorial per week. Prerequisites: 103. A survey of relevant contemporary issues and topics in linguistic research on the structure of German. (SP) Shannon

290. Seminar in German Linguistics. (4) Course may be repeated for credit. Two hours of seminar and one hour of tutorial per week. Variable topic. For specific topic contact departmental office. (F, Rauch)

291. Methods and Issues in German Morphology. (4) Two hours of seminar per week. The seminar will deal with the methods and results of morphological analysis as applied to the German language. It will introduce basic concepts and means of morphological analysis, as well as study and apply various theories of word structure to German. The primary concern will be the synchronic analyses of modern German word formation, but questions of a diachronic nature as well as ones about inflection will also be discussed. (F) Shannon

292. German Syntax. (4) Two hours of seminar per week. Formerly German 290G. Discussion of current syntactic theories as applied to a number of issues in modern German syntax with an eye toward their descriptive and explanatory potential. Typological comparison, especially with English.

293. German Semantics. (4) Two hours of seminar per week. Formerly German 290A. Concentration on the essential categories of semantics via data from German and Germanic. Extensive discussion of semantic change, the semantics of formal means, and the semantics of pathological language.

294. Contrastive Grammars. (4) Two hours of seminar per week. Theory and methods of contrastive linguistic analyses. Study of paradigms of contrastive language sets in two time perspectives: Modern German with Modern English and Early New High German with Early New English.

295. Dialectology. (4) Two hours of seminar per week. Formerly German 290F. Discussion of modern methods and results in the investigation of present-day German dialects.

296. Semiotics. (4) Two hours of seminar per week. Formerly German 290D. 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.

Group and Individual Study

298. Directed Group Study. (2-8) May be repeated for credit when topic changes. Seminar. Must be taken in conjunction with 290F. (F, SP) Staff

299. Individual Study for Graduate Students in Literature and Linguistics. (2-12) May be repeated for credit. Individual conference. Primarily for post-M.A. students engaged in exploration of a restricted field, involving writing of a report, and for students writing their doctoral dissertations. (F, SP) Staff
Courses in the Teaching of German

*300. The Teaching of German in Elementary and Secondary Schools. (4) Three hours of lecture per week. For credential candidates.

301A-301B. The Teaching of German in College. (3,3) Two hours of seminar per week. Credit and grade to be awarded upon completion of the sequence. Formerly 1 and a part to be decided on by the class. Discussion primarily in German. A co-operative seminar for student teachers fulfilling their residence and teaching credential requirements.

39A. Modern Dutch Prose in the Lowlands. (3) Two 90-minute seminars per week. The course will be a Freshman/Sophomore seminar dealing with the postwar prose originating in Holland and Flanders.

39B. Modern Dutch Poetry in the Netherlands and Belgium. (3) Two 90-minute seminar per week. The course will be a Freshman/Sophomore seminar dealing with the poetry of the Netherlands and Flanders in English translation. Since the poetry is in English translation, some emphasis will also be placed on the original version and on the interpretation that the translator incorporated in the target poem. (SP) Snapper

Upper Division Courses

107. The Structure of Modern Dutch. (3) Three hours of lecture/discussion per week. Emphasis will be on the shorter prose works, including short stories. By the second semester, the divergent viewpoints from the Flemenings and the Dutch will be articulated. (F,SP) Snapper

160. Literature of the Lowlands in English Translation. (3) Three hours of lecture/discussion per week. Study of the major contemporary Dutch and Flemish writers and their works. (SP)

165. Flemish Literature in English Translation. Three hours of lecture per week. (F,SP)

200. Dutch Conversation. (2) Three hours of lecture/discussion per week. Credit and grade to be awarded upon completion of the sequence. Designed for student teachers fulfilling their residence and teaching credential requirements.

Yiddish

Lower Division Courses

*1. Elementary Yiddish. (5) Three 1/3-hour lecture/discussion periods per week. Formerly 1 and a part to be decided on by the class. Discussion primarily in Yiddish. A co-operative seminar for student teachers fulfilling their residence and teaching credential requirements.

*2. Elementary Yiddish. (5) Three 1/3-hour lecture/discussion periods per week. Formerly 1 and a part to be decided on by the class. Discussion primarily in Yiddish. A co-operative seminar for student teachers fulfilling their residence and teaching credential requirements.

Upper Division Courses

*110. Advanced Yiddish. (3) Three hours of lecture/discussion per week. Prerequisites: consent of professor. A course in written and spoken Yiddish, focusing on Yiddish literature, Yiddish newspapers and articles dealing with modern Yiddish culture. (F,SP) Snapper

130. Advanced Grammar and Composition. (3) Three hours of lecture/discussion per week. Prerequisites: 110 or consent of instructor. A course in written Yiddish extending students' knowledge of grammatical patterns, especially those occurring primarily in the written language. Extensive reading and writing practice. (F,SP) Snapper

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. A course in contemporary Dutch literature. (F,SP) Snapper

*150. Introduction to the Literature of the Netherlands. (3) Three hours of lecture/discussion per week. Prerequisites: 110 or consent of instructor. An introduction to the study of literature in general and to the literature of the Netherlands in particular. Selected readings in Dutch poetry, prose and drama. Emphasis on different genres in literature.

160. Literature of the Lowlands in English Translation. (3) Course may be repeated for credit when topic changes. Three hours of lecture/discussion per week. Study of the major contemporary Dutch and Flemish writers and their works. (SP)

165. Flemish Literature in English Translation. Three hours of lecture per week. (F,SP)

*165A. The Second World War. Three hours of lecture per week. Novels, short stories, and poetry dealing with the war by such writers as Hugo Claus, Louis Paul Boon, and Ward Ruyslink."
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. The master's portion of the curriculum consists of at least 20 units of academic course work and a thesis. Students are expected to acquire a solid familiarity with a selected area of interest related to health and medicine. This master's work will also enable students to do independent work in this area. The master's program is interdigitated with the required preclinical sciences curriculum during the first three years of medical school. This program seeks to achieve a five-year experience, to make integration of clinical and academic aspects of the curriculum. Berkeley awards the master's degree upon 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. Students selected for this program must have focused intellectual interests in a field that would complement their medical training. They must also meet the rigorous academic requirements for entrance into medical school and have formed some commitment to the broader aspects of health care.

Genetic Counseling Program. Genetic counseling involves assisting individuals and families to understand and 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 are members of a medical team in a general genetics clinic, prenatal diagnosis clinic, or prenatal screening program. The two-year program leads to a M.S. Didactic courses include medical and clinical genetics; clinical techniques in biochemistry, cytogenetics, and DNA technology; relevant aspects of fertility and embroyology; counseling techniques and related aspects of psychology, social work; and community resources and education. 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 vary. 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 premedical requirements as and have taken the Medical College Admission Test.

For more detailed information about the Joint Medical program, telephone 642-5671; the Genetic Counseling program, 642-6326.

Graduate Courses

201. Systemic and Regional Human Anatomy. (7) Three 1-hour lectures; three 4-hour laboratories per week. Prerequisites: Molecular Cell Biology 134 or MCB 135D (formerly Anatomy 151 or Zoology 105) or other advanced work in mammalian biology; consent of instructor required. Formerly Anatomy 205. Dissection, x-ray and surface anatomy of the body, with special reference to the functional capacities of the structure examined. (F) Srebnek

202. Anatomy of Human Development. (2) Two 1-hour lectures per week. Prerequisites: Graduates standing in biological sciences. Formerly Anatomy 210. Informal conferences and demonstrations. Outside reading required. (F) Srebnek

205A-205B. Physical Diagnosis. (2,2) Five clinical hours per week. Prerequisites: Graduate standing in HMS Joint Medical Program; concurrent enrollment in 206A or 206C. A. Introduction to the Patient Interview. The physical examination of fellow students, lectures, demonstration, and organization of demonstration cases. The organ system approach will be used. B. The complete patient interview and complete physical examination with case presentation to staff and fellow students done on a weekly basis. A lecture on the examination of various organ systems will precede each ward experience (neuropathology, exam, etc.). (F) Staff

206A-206D. Introduction to Clinical Medicine: Basic Principles of Disease Processes. (3,3,3,3) Three hours of lecture and 2 1/2 hours of case presentation per week. Prerequisites: Graduate standing in HMS Joint Medical Program; consent of instructor. Formerly 206A-206B-206C-206D. A 4-semester sequence introducing basic principles of clinical medicine taught by organ system and ending in integrated overview applying the basic concepts to a community course twice weekly. One session is didactic, meeting 1 1/2 hours; the second weekly session is held at various hospitals, and has a 1 1/2 hour lecture followed by 2 1/2 hours of case presentation of hospitalized ambulatory patients who demonstrate the lecture topic. (F,SP) Swartzberg

208. Introduction to Clinical Psychiatry. (4) One 3-hour lecture and one 2-hour laboratory per week. Prerequisites: Graduate standing in HMS Joint Medical Program; consent of instructor. Covers basic principles of psychiatry, along with a body of knowledge about the human mind 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) Nevins

209A-209B. Principles of Human Pathology. (5,5) Two 2-hour lectures and two 2-hour laboratories per week. Prerequisites: Human anatomy, histology, physiology, biochemistry and consent of instructor. An in-depth study of generation, development, and death: inflammation and repair; hyperplasia-neoplasia; and disorders of immunity. A detailed study of the pathologic basis of diseases affecting specific organ systems. (F,SP) Nemzer

210. Physical Basis of Radiology and Nuclear Medicine. (2) One 1/2-hour lecture per week plus occasional laboratory field trips. Prerequisites: Graduate standing in HMS Joint Medical Program or consent of instructor. Provides the base in radiation physics necessary for intelligent use, understanding, and evaluation of clinical services given by radiologists and nuclear medicine clinicians. Topics: fundamental radiation physics, radiation biology, environmental radiation, introduction to nuclear medicine, clinical, diagnostic, and therapeutic radiology. (SP) Staff

211. Medical Neurobiology. (3) Two 1/2-hour lectures per week. Prerequisites: Graduate standing in HMS Joint Medical Program or consent of instructor. A review of the basic principles of Neurobiology concentrating first on the structural and functional properties of the components of the central nervous system: electrical properties; synaptic transmission; visual pathways and other special senses; the cerebellum. Later, a review of the general functional aspects and their relationship to activity and behavior, such as consciousness; E.E.G.; sleep; coma; aging; pain; regeneration, etc. (SP) Steinbach

220. Human Physiology. (4) Two 1/2-hour lectures per week; one 4-hour case discussion and laboratory per week. Prerequisites: 201; Molecular 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 by means of lecture and laboratory, with relevant demonstrations of human physiology. (SP) Steinbach

227. Introduction to the Clinical Process. (2) One 1 1/2-hour lecture and one 1 1/2-hour laboratory per week. Must be taken with a preclinical laboratory. Prerequisites: Graduate standing in HMS program. An interdisciplinary approach to basic knowledge and skills necessary for health and professional-client interaction. Focus is development of observational, interpersonal, gathering, and interpersonal communication skills. (SP) Staff

231A-231B. Principles and Practices of Counseling in Health Settings. (3,3) Three hours of lecture/seminar per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Graduate standing in HMS Program. Consent of Instructor. The 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 practice. Second semester open only to HMS students in Genetic Counseling has special emphasis on genetic counseling, including family dynamics and role playing. (F,SP) Halpern

247. Health Politics, Policy, and Policy Analysis. (4) Four hours of seminars per week. Prerequisites: Graduate standing in HMS Program or consent of instructor. This seminar for future health practitioners presents a multi-disciplinary analysis of health services organization, financing, policy, and implementation. Students will study policy questions and analyze health care problems regarding the social and political forces and institutions that affect health. (F) Halton

281A-281B. Thesis Seminar. (5,5) Credit and grade to be awarded at the end of each two-semester sequence. One 2-hour meeting every two weeks. Must be taken with a satisfactory or unsatisfactory basis. Prerequisites: Graduate standing in HMS Joint Medical Sciences Program. A required 2-year seminar to reevaluate and critique student progress in the UCSF-UCLA-UCSF joint medical Program's M.S. curriculum. Conduct of the course will be by and for students in the program. The phases of development of the research plan, protocol design and implementation, analysis of research findings, will be discussed through stages by students in each of the program's three years, beginning with the 2nd semester of the 1st year and ending after the 1st semester of the 3rd year. Staff

262. Ethics Committees and Health Care Decision Making. (2) Course may be repeated with the consent of the instructor. One 2-hour lecture per week. Prerequisites: Graduate standing in HMS Joint Medical Program or consent of instructor. Students will be introduced to some of the perplexing moral issues that permeate the practice of modern medicine and discussion will focus on methods for grappling with these problems. Actual cases discussed by hospital ethics committees in the Bay Area, and presented by committee members, will serve as a focus for class meetings. (SP) Kushner

290A-290B. Seminar in Advanced Genetic Counseling. (3,3) Three hours of lecture per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: 231A-231B or consent of instructor. Ongoing case discussion and analysis of genetic counseling field experiences. Primarily designed for students preparing to work as genetic counselors. (F,SP) Well

292. Colloquium on Health and Health Care. (1) Course may be repeated for credit. One 1 1/2 to 2-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. A series of guest lecturers will discuss aspects and implications of health and health care from personal and professional perspectives and experience. Specific topics are developed in consultation with students and include primary care in the community, science in society, and issues in community groups. Field trips or community sites may be arranged. (F,SP) Staff

296. Special Study. (1-10) Course may be repeated for credit. Individual meetings with faculty members. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Designed to permit qualified graduate students to pursue special study under the direction of a faculty member. (F,SP) Staff

298. Directed Group Study. (1-5) Variable. Sections 1-8 to be taken on a satisfactory/unsatisfactory basis; sections 9-17 may be taken for grade with departmental approval. Prerequisites: Graduate standing in HMS Program. Consent of instructor. Group study for graduate students. Intensive examination of health related topics. (F,SP) Staff
History

(Office of Letters and Science)

Department Office: 3299 Dwinelle Hall, 642-1797

Professors:
- Richard M. Abrams, Ph.D. Columbia University, Recent U.S., political, economic
- Anthony T. Bennett, Ph.D. University of Leeds. Late modern Europe, international relations
- Thomas G. Barron, D.Phil. Oxford University, Britain since 1509, Tudor-Stuart, legal
- Gunther Barth, Ph.D. Harvard University, Recent U.S., social, urban
- Mary E. Berry, Ph.D. Harvard University, Japan
- Thomas A. Brady, Ph.D. University of Chicago. Early modern Europe, Reformation Germany
- Robert J. Brentano, D.Phil. Oxford University, Medieval, England, Italy, Church
- Gerald E. Caspary, Ph.D. Harvard University, Medieval Europe, intellectual
- Jan de Vries, Ph.D. Yale University. European economics, Europe, social and political
- Tulio S. Halperin, Ph.D. University of Buenos Aires. Latin America, social, cultural
- Richard A. Webster, Ph.D. Columbia University. Late modern Europe, Italy, political
- Rafael G. Zeletin, Ph.D. Stanford University. Late modern Europe, Russia, labor

Associate Professors:
- Margaret L. Anderson, Ph.D. Brown University. Late modern Europe, Germany, political
- Robin L. Einhorn, Ph.D. University of Chicago. Early modern Japan
- Richard C. Sutch, Ph.D., Massachusetts Institute of Technology. U.S., economic
- Diane S. Clemens, Ph.D. University of California at Santa Barbara. Recent U.S., diplomatic
- Lawrence N. Garrigues, Ph.D. University of Minnesota. 19th-century U.S., diplomatic
- James R. Gregory, Ph.D. University of California at Berkeley. California, labor
- John E. Lesch, Ph.D. University of Pennsylvania. History of science, biology, life sciences
- Linda Levin, Ph.D. Columbia University. Latin America, Brazil, family
- Richard J. Seltzu, Ph.D. Princeton University. Latin America, colonial, economic

Assistant Professors:
- Andrew E. Barshay, Ph.D. University of California at Berkeley. Early modern Japan
- Lewis E. Brinnell, Ph.D. Yale University. Late modern Europe, European
- Carla A. Hess, Ph.D. Princeton University. Early modern Europe, social and political
- Geoffrey G. Koh, Ph.D. Stanford University, Medieval Europe, French
- Peter Sahney, Ph.D. Princeton University. Early modern Europe
- Wen-hsing Yeh, Ph.D. University of California at Berkeley. Modern China, social and cultural

Professors:
- Guenter B. Risse, Ph.D. University of Chicago, M.D. University of Buenos Aires. History and philosophy of medicine (Health Sciences, UCSF)
- Harry N. Scheiber, Ph.D. Cornell University. U.S., legal
- Barbara Shapiro, Ph.D. Harvard University. English literature, 1500-1700. (Rhetoric)

Major Advisers: Consult Undergraduate Office

The Department of History offers a program of instruction ranging widely over the historical record of human experience in terms of 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 work 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, typically for a total of 44 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:

- Not offered 1991-92
- On leave, spring
- On leave, fall

I. Western Civilization to 1400: 4A, 4B, 30A; Freshman and Sophomore Studies 44A, 44B; Undergraduate Interdisciplinary Studies 55A.

II. European History since the Renaissance: 45, 49, 30B, 31; Freshman and Sophomore Studies 44C, 44D; Undergraduate Interdisciplinary Studies 55B.

III. History of the United States: 7A, 7B, 16, 17A, 17B.

IV. Latin America, Asia, Africa: 8A, 8B, 9A, 9B, 9C, 10B, 10C.

A 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-1600 and post-1600 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 seniors majoring 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 faculty member and discussions with students of similar interests. Interested students should notify the head of the departmental Honors Committee during their junior year.

All 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 H195 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 H195 or 285, 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 H102, the oral examination, and the research essay. If the student's work is of honors 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.

Education at Home Program. Students with a specific interest in early American history and culture may wish to participate in the Education at Home Program. The program, conducted through the UC Riverside campus, is open to undergraduates from any campus. Those selected for participation will spend nine weeks in Williamsburg, one in Philadelphia, and a concluding week in Washington, D.C.; it is a one-quarter session. For further information or application forms, call (714) 787-3820 or write to Education at Home Program, International Services Center, University of California at Riverside, CA.
92521. UC Berkeley history majors should consult the department for information on major credit for the program.

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 issue issued prior to each semester and the department 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

4. Origins of Western Civilization. Two 1-hour lectures and two 1-hour sections per week. Introductory study of major historical events in the origins of western civilization. Emphasis on class discussions, readings in the sources, and writing of essays.

A. Ancient. (4) (F)

B. Medieval. (4) (F)

5. European Civilization From the Renaissance to the Present. (4) Two hours of lecture and 2 hours of section per week. A survey of Europe from the Renaissance to the present.

7. Introduction to the History of the United States. Two to three hours of lecture and 2 hours of sections per week.

7A. From Colonial Settlement to the Civil War. (4)

7B. From the Civil War to the Present. (4)

8. Latin American History. Two hours of lecture and 2 hours of section per week.

8A. The Colonial Period. (4)

8B. The National Period. (4)

9. Asian History. Two hours of lecture and 2 hours of section per week. An introductory survey of the history of Asia.

9A. China. (4)

9B. Japan. (4)

9C. India. (4)

9D. Middle East. (4)

10. African History. (4) Two hours of lecture and 2 hours of section per week. An introductory survey of the history of Africa.

15. Topics in the History of Modern Europe. (3) Two hours of lecture and 1 hour of discussion per week. Selected topics, themes, and writings in the history of Europe from approximately the 15th century to the present. For descriptions of topics, consult the department catalog during pre-enrollment week each semester.

16. The Forging of the U.S.: Expansion and Interaction among American Peoples. (4) Two 50-minute lectures and one hour seminar per week. Considers the culturally diverse Americans who reside within the geographical boundaries of today 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 Americans and Pacific Rim peoples. (F,SP)

17A-17B. Studies in American History. (4) Four hours of meeting per week. Intended to introduce students to the problems and methods of studying American history through the use of primary source materials.

30. Science and Society. Not to be taken by students who have previously enrolled in 130A-130B.

130C. Two hours of lecture and 2 hours of discussion per week.

30A. Science From Antiquity Through Newton. (4) The emergence of science as an organized activity.


31. The Voyages of Columbus. (4) Two hours of lecture and two hours of discussion per week. The course uses Columbus' voyages as a lens for examining geography, cartography, navigation, ship building, exploration, commerce, medicine, natural history, ethnology, etc., during the Renaissance and early-modern times. The examination will take into account the political, social, and religious circumstances of the age.

39. Seminars for Lower Division Students. (4) May be repeated once for credit with different instructor. One three-hour meeting per week. Prerequisites: Consent of instructor. Seminars in the various fields of history designed to introduce beginning undergraduates to problems of historical methods and interpretations. Work in the course will include research and a research paper. For precise schedule of offerings, see department catalog during pre-enrollment week each semester. This course meets for at least twelve hours per week including time spent in class and in outside reading and preparation.

98. Directed Group Study for Lower Division Students. (4) May be repeated once for credit with different instructor. One hour of directed group study per week. Must be taken on a passed/not passed basis. Only for students enrolled in a lower-division history lecture course. An extra weekly session emphasizing writing and speaking skills, taken in addition to regular lecture and discussion. (F,SP)

Upper Division Courses

100. Special Topics in the Various Fields of History. (4) May be repeated for credit. Four hours of lecture and discussion per week. Designed primarily to permit the instructor to present a topic with a flavor 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.

100X. Special Topics: Short Course. (1) Does not satisfy major requirement for history majors. Course may be repeated for credit. Four hours of lecture and seminar per week. Must be taken on a passed/not passed basis. An abbreviated version of History 100, lasting four weeks only. Topics and instructors vary. Consult department catalog for details.

101. Seminar in Historical Research and Writing for History Majors. (4) Two hours of seminar meeting per week. Individual research projects carried out in seminar sections in various historical fields resulting in a lengthy paper, with readings and discussions on general problems of historical inquiry. In addition to regular class meetings, individual consultations with the instructor, research, and preparation totalling ten to twelve hours per week are required.

101H. Colloquium on Historical Thought. (4) Two hours of seminar meeting. 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 consent of each instructor.

103. Proseminar: Problems in Interpretation in the Several Fields of History. May be repeated for credit with consent of instructor. Three hours of seminar and discussion per week. Prerequisites: Consent of instructor. Designed primarily to give majors in history initial 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.

103A. Ancient. (4)

103B. Europe. (4)

103C. England. (4)

103D. United States. (4)

103E. Latin America. (4)

103F. Asia. (4)

103H. Africa. (4)

103N. Canada. (4)

103S. History of Science. (4)

103U. Studies in Comparative History. (4)

103A. Ancient Greece. Three hours of lecture and 1 hour of discussion per week. (F,SP)

105A. Bronze Age and Archaic. (4) Until ca. 500 B.C. The beginnings of organized activity in Greek cities.

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 1 hour of discussion per week.

106A. The Roman Republic. (4) A history of Rome from the foundation of the city to the dictatorship of Caesar. The course examines the evolution of Republican government, the growth of Roman imperialism, and the internal disruptions of the age of the Gracchi, Sulla, and 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, the emergence of Christianity, 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. (F)

107A. Ancient Athenian Law. (4) This course will concentrate on the courts and procedural law in their historical development. Some attention will be given to distinctive features of Athenian law in comparison to other systems.

107B. The Age of Cicero. (4) Examination of events, forces, and trends involved in the fall of the Roman Republic in the crucial years between the deaths of Sulla and Cicero. Analysis of Cicero's speeches, essays, and correspondence. Political, social, and economic struggles in light of intellectual and cultural currents.

107C. Women in the Life and Thought of Ancient Greece. (4) Three hours of lecture and one hour of discussion per week. This course will examine the legal, social, and economic status of women in ancient Greece as compared to the treatment of women in the imaginative literature authored by the ancient Greeks.

108. Byzantium. (4) Three hours of lecture and 1 hour of discussion per week. The social, cultural, and religious history of the Near East and eastern Mediterranean from late antiquity through the early middle ages. The survival of the Roman Empire in Byzantium, the Sassanian Empire in Iran, and the rise of Islam are the topics covered.
109A. Islamic History. (4) Three hours of lecture and 1 hour of discussion per week. The Middle East from the origins of Islam to the 13th Century. The Arab conquests, the Islamic Empires, the successor states, and the formation of Islam as a religion and culture.

109B. The Middle East, 1000-1750. (4) Three hours of lecture and 1 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 1 hour of discussion per week. The forrnation of Islam as a religion and culture. The Arab con

110. Inner Asia. (4) Three hours of lecture and 1 hour of discussion per week. Origins, development, and dynas

111. Africa. Three hours of lecture and 1 hour of dis
cussion per week.

112A. Pre-Colonial Period. (4)

112B. Modern Africa. (4)

114. India. Three hours of lecture and 1 hour of dis
cussion per week.

114A. Ancient and Medieval India to the Mu
g Empire. (4)

114B. Modern India. (4)

115. Topics in the History of India. (4) Three hours of lecture and 1 hour of discussion per week. (SP)

116. China. Three hours of lecture and 1 hour of dis
cussion per week.

116A. Early China. (4)

116B. The Middle Period. (4)

116C. Modern China. (4)

117. Topics in Chinese History. Three hours of lecture and 1 hour of discussion per week.

117A. Social History of China. (4) Social groups and organizations from the origins of Chinese civilization to the present. Especially stressed are Chinese feudalism, the medieval oligarchy, the rise of the gentry, peasant rebellions, late-imperial mercantilism, and modern student movements.

117B. Modern Chinese Intellectual History. (4) Tra
ditional Chinese roots of 19th-Century reformist thought are traced; modern Sino-Western revolutionary nationali

tism is analyzed through the overthrow of the Manchu, the rule of the Nationalists, and the rise of the Communists.

118. Japan. Three hours of lecture and 1 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 int

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; tracing the 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.

119. Topics in Japanese History. Three hours of lecture and 1 hour of discussion per week.

119A. Social History of Japan. (4)

119B. Economic History of Japan. (4) Japanese social and economic history from the middle Tokugawa pe

121. The Colonial Period and American Revolu

tion. Three hours of lecture and 1 hour of discussion per week.

121A. The Colonial Period. (4)

121B. The American Revolution. (4)

122. The United States, 1787-1845. (4) Three hours of lecture and 1 hour of discussion per week. (F)

123. Civil War and Reconstruction. (4) Three hours of lecture and 1 hour of discussion per week. (SP)

124. The Recent United States. Three hours of lec

ture and 1 hour of discussion per week.

124A. Late Nineteenth Century to the Eve of World War II. (4) The transformation of American society from a 19th century political and economic order to the emergence of America as a modern mass society and world power.

124B. 1941-1980. (4) American culture and political economy amidst affluence and turmoil in war and cold war.

125. History of Black People and Race Relations in the United States. Three hours of lecture and 1 hour of discussion per week. History of Afro-Americans: their African backgrounds, slave experience, social and cultural experience since emancipation. The course will consider race relations, particularly between blacks and whites. (SP)

125A. 1500-1865. (4)

125B. 1865 to the Present. (4)

125A-125B. The West In United States History. (4) Three hours of lecture and 1 hour of discussion per week. A cultural and social history of westward migra
tion from the 16th to the 20th Centuries.

127. California. (4) Three hours of lecture and 1 hour of discussion per week. The history of California from pre-European contact to the present, with emphasis on the diversity of cultures and the interplay of social, e

130. Diplomatic History of the United States. Three hours of lecture and 1 hour of discussion per week. European diplomatic impact on emerging America’s foreign policy, colonial, revolutionary, and constitutional periods. Nineteenth century expansionism to imperiali

130A. 1900-1914. (4)

130B. 1914-Present. (4)

131. Social History of the United States. Three hours of lecture and 1 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) Three hours of lecture and 1 hour of dis
cussion per week.

133. Religion in American Society. (4) Three hours of lecture and 1 hour of discussion per week. Prerequisites: Previous work in American history essen
tial; some knowledge of European history desirable. American religious history from the beginnings to the present; emphasis on the relation between doctrine and social effec
t. The interplay of Protestantism, Catholicism, Judaism, Eastern religions, and non-theist humanism.

134A-134B. The Age of the City. (4) Three hours of lecture and 1 hour of discussion per week. A cultural and social history of urban life in America, with empha

135. American Economic History. (4) Students hav

136. Women in American Society. (4) Three hours of lecture and one hour of discussion per week. A sur

137. The Repeopling of America. (4) Three hours of lecture and one hour of discussion per week. This course examines the coming together of people from five continents to the United States and provides an historical overview of the shifting patterns of immigra
tion. The course begins in the colonial era when serv

138. Topics In United States History. Three hours of lecture and one hour of discussion per week.

139. Working Class in the United States. (4) The history of American workers from Colonial times to the present; emphasizing the changing patterns of tech

140. Mexico. (4) Three hours of lecture and 1 hour of discussion per week. The history of Mexico from the colonial inspection of Jose de Galvez (1765-1771) through the present. The liquidation and transforma
tion of the ancient regime through rebellion, reform, and revolution.

141. Social History of Latin America. Three hours of lecture and 1 hour of discussion per week.


142. The Andean Region. (4) Three hours of lecture and 1 hour of discussion per week. History of the Andean region, the 'area that now comprises modern Peru, Bolivia, and Ecuador, from the Indian period (fif

teenth century) to the present.

143. Brazil. (4) Three hours of lecture and 1 hour of discussion per week. From 16th Century conquest and settlement to the emergence of an industrial economy during the post-1945 period of military rule. Emphasis on dependence of colony on empire, on plantation agriculture, slavery, export economy, and the transition from agrarian to industrial society.

144. Modern Argentina. (4) Three hours of lecture and 1 hour of discussion per week. Post-independen
dence rise of Buenos Aires and of the cattle export economy. The creation of the national state: immigration, modernization, agricultural expansion. The exhaus
tion of the export economy; growing social and political conflicts.

150. Medieval England. Three hours of lecture and 1 hour of discussion per week. Emphasis on interpr

tation of primary sources.

150A. The Anglo-Saxon Period. (4) From the Romans through the Norman conquest (to Domeday Book and Eadmer).

150B. From the Conquest to the Fifteenth Century. (4) Government, observation of government, community, religion, and social change, who dress on the twelfth and fourteenth centuries.

151. Modern Britain. Three hours of lecture and 1 hour of discussion per week. Prerequisites: An ele

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall
*Recipient of Distinguished Teaching Award
Survey history of Britain from approximately the Tudor period to the present.

151A. 1485-1660. (4)
151B. 1660 to the Present. (4)

152. Topics in British History. (4) Three hours of lecture and 1 hour of discussion per week.

153. British Empire and Commonwealth. (4) Three hours of lecture and 1 hour of discussion per week.

154. Canada. (4) Three hours of lecture and 1 hour of discussion per week. A survey of Canadian history from exploration and first settlement through colonial times to confederation and nationalhood to the present.

155. Medieval Europe. Three hours of lecture and 1 hour of discussion per week.

155A. From the Late Empire to the Investiture Conflict. (4) Formulation of a West European civilization; stress on tribal settlements, the Carolingian Empire, and Christian foundations.

155B. From the Investiture Conflict to the Fifteenth Century. (4) Crusades; empires, pagacy and the Western monarchies; social change, the rise of towns and heresy; culture and learning. Medieval civilization at its height.

156. Topics in Medieval History. Course may be repeated once for credit with consent of instructor.

156A. History of Christian Thought, 200-600 A.D. (4) Three hours of lecture and one hour of discussion per week. Emphasis on the "symbolist" (rather than the "sequential") mentality which pervaded the patriciate 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.

156B. Medieval Intellectual History, c. 1050-1270. (4) Three hours of lecture and one hour of discussion per week. Emphasis on the interplay between the symbolist and the sequential, and the growth of new forms of "scientific," linear or sequential thinking (scholasticism) found in the new cathedral schools and universities.

156C. The State in the Middle Ages. (4) Three hours of lecture and one hour of discussion per week. An inquiry into the nature of the "State", the conditions of its emergence in the later middle ages, and its place in fundamental issues of political morality.

157. The Renaissance and the Reformation. (4) Three hours of lecture and 1 hour of discussion per week. European history from the fourteenth to the mid-sixteenth centuries. 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.

158. Modern Europe. Three hours of lecture and 1 hour of discussion per week.

158A. Early Modern and Revolutionary Europe. (4)
158B. 1815-1914. (4)
158C. 1914 to the Present. (4)

159. European Economic History. (4) Three hours of lecture and 1 hour of discussion per week. Survey of the economic and social developments of Europe up to the eve of industrialization. Including the transformation of peasant-based, agrarian economies, capitalist organization, colonial expansion, and international trade. This course is equivalent to Economics 111A; students will not receive credit for both courses.

159A. European Economic History. (4) Three hours of lecture and one hour of discussion per week. Survey of the economic and social developments of Europe up to the eve of industrialization. Including the transformation of peasant-based, agrarian economies, capitalist organization, colonial expansion, and international trade. This course is equivalent to Economics 111A; students will not receive credit for both courses.

159B. European Economic History. (4) Three hours of lecture and one hour of discussion per week. The industrial revolution and the rise of the European economy to world dominance in the 19th century, emphasizing the diffusion of the modern system and its consequences, the world trading system, the rise of modern imperialism. This course is equivalent to Economics 111B; students will not receive credit for both courses.

160. The International Economy of the Twentieth Century. (4) Three hours of lecture and one hour of discussion per week. Development and crises of the advanced economies, with particular emphasis on trade relations 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.

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. European Diplomatic History, (4,4) Three hours of lecture and 1 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 1 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 1 hour of discussion per week.

164A. European Society Before the Industrial Revolution. (4)
164B. European Society From 1750 to the Present (4)

165. Topics in Modern European History. Three hours of lecture and one hour of discussion per week.

166. Modern France. Three hours of lecture and 1 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 1 hour of discussion per week.

167A. Germany in the 19th Century. (4)
167B. Germany in the 20th Century. (4)

168. Spain and Portugal. Three hours of lecture and 1 hour of discussion per week.

168A. From Earliest Times to 1715. (4)
168B. From 1715 to the Present. (4)

169. Modern Italy. (4) Three hours of lecture and 1 hour of discussion per week.

170. The Netherlands. (4) Three hours of lecture and 1 hour of discussion per week. The Lowlands from the earliest times to the present monarchy; emphasis on the Golden Age of the 17th and 18th Centuries.

171. Russia. Three hours of lecture and 1 hour of discussion per week.

171A. Russia to 1700. (4)
171B. Russia 1700-1917. (4)
171C. The Soviet Union, 1917 to the Present. (4)

172. Topics in Russian History. (4) Three hours of lecture and 1 hour of discussion per week.

A. Russian Intellectual History to the Present.

173. History of Eastern Europe. Three hours of lecture and one hour of discussion per week.

173A. From Earliest Times to ca. 1500. (4)
173B. From 1500 to 1800. (4)
173C. From 1800 to Present. (4)

174. Modern Jewish History, 1648 to the Present. (4) Three hours of lecture and 1 hour of discussion per week.

180. Topics in the History of Biology. (4) Three hours of lecture and 1 hour of discussion per week.

181. Topics in the History of the Physical Sciences. Three hours of lecture and 1 hour of discussion per week.

181A. Astronomy and Astrology in Medieval and Early Modern Europe. (4) Prerequisites: Strong grasp of plane geometry.


181C. Chemistry and Its Past. (4)

182A. Topics in the History of Technology. (4) Three hours of lecture and 1 hour of discussion per week.

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 1 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 from antiquity to the present.

185A. Beginnings to ca. 1250. (4)
185B. 1250 to the Present. (4)

195S. Senior Honors. (4) Independent. Prerequisites: Senior honors standing. Limited to senior honors candidates. Directed study centering upon the preparation of an honors thesis. Supervisors will be assigned to each student after consultation with the honors committee.

198X. Directed Group Study. (1) Course may be repeated for credit. Two hours of discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Course must be an extension of an existing history course. Extra weekly sessions emphasizing writing and speaking skills, taken in addition to a regular upper division lecture course.

199. Supervised Independent Study and Research. (1-4) May be repeated for credit. Independent. Must be taken on a passed/not passed basis. Prerequisites: Enrollment is restricted by regulations.

Graduate Courses

200X. Special Topics: Short Courses. (2) Course may be repeated for credit. Four hours of lecture and seminar per week. A four-week long course permitting the instructor to cover in-depth a topic of particular interest. Topics and instructors vary; consult department catalog for details.

275. Core Courses in the Literature of the Several Fields of History. Course may be repeated for credit. Two to three hours of meeting per week. To provide a broad survey of the literature and historiographical problems of the different fields in history.

275A. Ancient. (4)
275B. Europe. (4)
275C. England. (4)
275D. United States. (4)
275E. Latin America. (4)
275F. Asia. (4)
275N. Canada. (4)
275S. History of Science. (4)
280. Advanced Studies: Sources/General Literature of the Several Fields. Course may be repeated for credit. Two to three hours of meeting per week. For precise schedule of offerings see department catalog during preenrollment 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)
280T. Economic History. (4)
280U. Studies in Comparative History. (4)
281. Paleography and Other Auxiliary Sciences. (4) Course may be repeated for credit with different instructor. Two to three hours of meeting per week. Introduction to the scholarly handling of texts, whether ancient, medieval, or modern, and instruction 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.

282. Numismatics. (4) Two to three hours of meeting per week. The use of coins as an historical source; theory and practice.

283. Historical Method and Theory. (4) Two to three hours of meeting 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 preenrollment week each semester.

284A-284B. Quantitative Approaches to History and Demographic History. (4) Two to three hours of meeting per week. Study and application to history of quantitative methods and theories (e.g., statistics, demography, computors); the use of population materials for the study of social history.

284L. Laboratory Section. (1) One hour of lecture and three hours of laboratory per week. Introduction to Computing. This course teaches the use and application of packaged statistical and text-editing programs, emphasizing special lines of particular interest to historians. The course can be taken concurrently with History 284, but is offered independently of other departmental courses.

285. Research Seminars. Two to three hours of meeting per week. For precise schedule of offerings see department catalog during preenrollment 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)
285N. Canada. (4)
285S. History of Science. (4)
285T. Economic History. (4)
285U. Studies in Comparative History. (4)
285V. Supervised Research Colloquium. (2-5) Course may be repeated for credit. Two hours lecture per week. Prerequisites: Consent of instructor; preparation, presentation and criticism of research papers.

286. Directed Dissertation Research. (3-12) May be repeated for credit. Independent. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Open to qualified students directly engaged upon the doctoral dissertation.

287. Independent Study for Graduate Students in History. (2-12) May be repeated for credit. Independent. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual conferences to be arranged. Tended to provide directed reading in subject matter not covered in scheduled seminar offerings.

287L. Laboratory Section. (1) One hour 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 of war, diffusion of science in technology, industrialization and the use of corporations. Sponsoring departments: History and Electrical Engineering and Computer Science.

Upper Division Courses

IDS 100. History of American Technology. (4) Four hours 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 of war, diffusion of science in technology, industrialization and the use of corporations. Sponsoring departments: History and Electrical Engineering and Computer Science.

Humanities

(College of Letters and Science)

Field Major Office: Division of Undergraduate Interdisciplinary Studies, 301 Campbell Hall, 642-5100

Major Adviser: Kathleen Moran.

Humanities Field Major

The humanities field major is closed to new students. Students interested in discussing other humanities concentrations should speak to either Kathleen Moran, 357 Campbell Hall, or Jain Hutzell, 301 Campbell Hall. The information below applies only to continuing students who declared the major through spring semester 1990.

Lower Division Requirements

1. One year of Western Civilization. Friedmann and Sophomore Studies 44 [formerly UGIS 44, and earlier Special Programs 44] or its equivalent. The list of courses that can be used to fulfill the requirement is available in the Division of Undergraduate and Interdisciplinary Studies. II. Foreign language—one year (two semesters) of an ancient or modern language appropriate to the individual program.

Lower Division Requirement I. The humanities field major is closed to new students. Students interested in discussing other humanities concentrations should speak to either Kathleen Moran, 357 Campbell Hall, or Jain Hutzell, 301 Campbell Hall. The information below applies only to continuing students who declared the major through spring semester 1990.

Lower Division Requirements

1. One year of Western Civilization. Friedmann and Sophomore Studies 44 [formerly UGIS 44, and earlier Special Programs 44] or its equivalent. The list of courses that can be used to fulfill the requirement is available in the Division of Undergraduate and Interdisciplinary Studies. II. Foreign language—one year (two semesters) of an ancient or modern language appropriate to the individual program.

Upper Division Requirements

1. Six courses (minimum 22 units) in at least three of the following fields or disciplines (two courses in the social sciences on natural science as may be substituted when appropriate): art, classics, comparative literature, dramatic art, film, history, history of art, languages and literature, music, philosophy, religious studies, rhetoric, and women's studies; II. Humanities 100, the core course for the major; III. Humanities 190, the senior thesis course.

Honors Program

Upper division students with an overall grade point average of 3.3 and a grade point average of 3.5 in the major may, upon approval of the adviser, enroll in the honors program. H195 will be substituted for Humanities 190. Requirements for graduation in the honors program include: I. 3.5 grade point average in all courses taken for the major in any term; II. 4.0 grade point average in all courses completed in the thesis workshop which meets for three hours each week during the first half of the semester. (F,SP) Staff

H195. Humanities Senior Honors Thesis. (4) Individual conferences and attendance at workshop. Prerequisites: 100. Entails writing a bachelor's thesis pertaining to the student's individual area of concentration within the Humanities Field Major. Each student will work under the direction of a faculty member and write and grade the thesis. In addition there will be a seven week thesis workshop which meets for three hours each week during the first half of the semester. (F,SP) Staff

198. Directed Group Studies. (1-3) Course may be repeated for credit. Conferences. Must be taken on a passed/not passed basis. Prerequisites: Completed 60 units and in good academic standing. Directed group study of special topics approved by the division. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Directed individual study on special topics approved by the Division. (F,SP) Staff

Industrial Engineering and Operations Research

(College of Engineering)

Department Office: 4135 Etcheverry Hall, 642-5484
Chair: Shmuel S. Oren, Ph.D.

Professors:
John Adler, Ph.D. Stanford University. Mathematical programming
Richard E. Barlow, Ph.D. Stanford University. Reliability theory
Stuart E. Dreyfus, Ph.D. Harvard University. Artificial neural networks
David Gale, Ph.D. Princeton University. Mathematical economics
Roger Glassy, Ph.D. Cornell University. Production systems, mathematical optimization
Dorit S. Hochbaum, Ph.D. University of Pennsylvania. Combinatorial optimization
Richard M. Karp, Ph.D. Harvard University. Combinatorial optimization
Shmuel S. Oren, Ph.D. Stanford University. Economic systems theory and modeling

Recipient of Distinguished Teaching Award
Graduate Programs

Graduate programs leading to the M.S., M.Eng., Ph.D., and D.Eng. are offered in two interrelated areas of study:

Industrial Engineering. This program has been developed to meet the needs of engineers who wish to enhance their competence in the design, analysis, control, and operation of complex systems in industrial, service, or public sectors, or to prepare for managerial positions from a broader perspective on modern engineering practice.

Operations Research. This program prepares the student for advanced work in the theory and application of system science. It emphasizes the development and use of quantitative models for the analysis and optimization of systems. Students may choose to concentrate on theoretical studies in preparation for doctoral level research, or on applications of state-of-the-art techniques to real world problems.

Undergraduates from scientific disciplines other than engineering may be accepted into these programs. A master's degree may be earned by thesis or by comprehensive examination. Doctoral degrees require oral examination in the major and minor fields of study and a thesis demonstrating the 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 verbal and quantitative aptitude scores of the Graduate Record Examination. Further information on graduate programs may be obtained at the Research Office, 4135 Etcheveiry Hall and in the Announcement of the College of Engineering.

Upper Division Courses

110. Interactive Computer Programming and Modeling Applications. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Knowledge of a computer programming language. Programming and software design using the interactive APL language. Prior knowledge of APL is not required. Lecture topics include machine-implemented APL algorithms, data manipulation operators, and file control functions. Important user-designed recursive functions and user-defined outer products as applied to computer simulations, file search, and optimization. (F) Jewell

115. Industrial and Commercial Data Systems. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: 110 and Engineering 7. Review of information system functions, technology, and organization, emphasizing industrial and commercial application requirements and economic performance criteria. Introductory study of systems-analysis, design, modeling and implementation tools and techniques. Design-oriented term project. (SP) Staff


131. Computer Simulation of Industrial Engineering Systems. (3) Three 1-hour lectures per week. Prerequisites: Statistics 134, 135. Introductory course on the design, programming, and statistical analysis of a simulation study. Discussions will include the types of problems that can effectively be solved by such methods. The programming material will also include the use of the APL language for use on a variety of computers under the control of a VAX. (SP Glassy)

140. Introduction to Industrial Production Methods. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: Statistics 135. Selection of production methods: manual vs. automated and fixed vs. flexible or robotic automation; economic analyses. Analysis of manual production methods; production and time study. Analysis of fixed automation; parts feeders and handlers, work heads, design for assembly: analysis of robots; kinematics, statics, sensors, and effectors, robot cell design. Project required. (F) Mendel

150. Production Systems Analysis. (3) Three hours of lecture per week. Prerequisites: 162; Engineering 7. Determination of integrated production systems; use of operations models and quantitative methods of operations research. (F) Hall

153. Facilities Planning and Design. (3) Two hours of lecture and two hours of discussion per week. Prerequisites: 150. Consideration of mathematical models of layout line balancing and conveyor systems. Analysis of integrated materials control systems involving functions of storing, recalling, delivery, inventory, and computer control. Design of automated warehousing and order-picking system simulation. (SP) Adiga


161. Operations Research II. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Statistics 134. Probability review. Conditional expectation. The exponential distribution; the Poisson process. Markovian Queueing Systems. Component reliability systems. Applications to replacement, repair, transportation and inventory models. (SP) Jewell

162. Linear Programming. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 50A, Formulation to linear programs. Optimal allocation and control problems in industry and environmental studies. Convex sets; properties of optimal solutions. The simplex method; theorems of duality; computational lackness. Problems of post-optimization. Special structures; network problems. Digital computation. (F,SP) Glassy, Adler

164. Introduction to Inventory Control and Queuing Models. (3) Three hours of lecture per week. Prerequisites: Statistics 134 or 100A. Graphical representation of cumulative arrivals and departures, storage, and delays. Analytical models: Markovian queueing processes. Decision analysis is introduced and applied to problems in inventory management, queuing, and manufacturing. Stochastic arrival and departure process, applications of Poisson processes. (SP) Hall

165. Forecasting, Quality Control and Quality Assurance. (3) Two 1½-hour lectures per week. Prerequisites: Statistics 134, 135. Influence diagrams based on the Bayesian approach are used to model engineering problems with special emphasis on quality assurance and quality control. Decision analysis is introduced and applied to problems in inspection sampling, and in prediction and control of manufacturing production quality. (F) Ross

170. Human Factors for Engineering Design. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: 140 or consent of instructor. Introduction to the design of human interfaces for engineering systems, with emphasis on the control of complex processes. Analysis of rational human decision making providing formal definitions of "acts," "states" and "observations" and optimal decision making rules. Design and evaluation of decision aids for process control, in the context of human-computer interfaces through User Information Management Systems (UIMS). Laboratory exercises and a design project using UIMS undertaken. (F) Mendel
171. Introduction to Design of Human Work Systems and Organization. (3) Three hours of lecture per week. Prerequisites: 150 or consent of Instructor. An engineering-oriented introduction to safety and health problems encountered in industry and commerce. Coverage includes OSHA legislation, safety organization, programs and equipment, analytical approaches using probability and fault-tree models, human reliability; and cost-benefit analysis. Field study undertaken.

172. Industrial Safety and Health. (3) Two hours of lecture and two hours of laboratory work per week. Prerequisites: 172 or consent of instructor. Examines the industrial engineering-oriented introduction to safety and health problems encountered in industry and commerce. Coverage includes OSHA legislation, safety organization, programs and equipment, analytical approaches using probability and fault-tree models, human reliability; and cost-benefit analysis. Field study undertaken.

180. Synthesis and Design of Industrial Systems. (3) Two hours of lecture and two hours of discussion per week. Prerequisites: 130, 150, 161 and 162 or Mechanical Engineering 105A; IEOR major or Manufacturing Engineering 106A. Comprehensive, Senior standing. Application of systems analysis and industrial engineering to the analysis, planning, and/or design of industrial or governmental systems. Consideration of technical and economic aspects of system design and process planning. Students work in teams under faculty supervision. Topics vary yearly. Written reports in lieu of final exam. (SP) Oliver

195. Directed Group Studies for Advanced Undergraduates. (1-4) May be repeated for credit. Must be taken on a pass/no pass basis. Prerequisites: Senior standing in Engineering. Group studies of selected topics. Semester course unit value and contact hours will have a one-to-one ratio. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for a maximum of four units per semester. Seniors only. Must be taken on a pass/no pass basis. Prerequisites: Consent of Instructor and major adviser. Supervised independent study. Please see pages 91-92 in the General Catalog for description and prerequisites. (F,SP) Staff

Graduate Courses

215. Analysis and Design of Databases. (3) Three hours of lecture and one 2-hour laboratory meeting per week. Prerequisites: 115 or consent of instructor. Data requirements determination and analysis. Conceptual design of databases using logical models. Implementation using Database Management System Software on mainframe and/or personal computer. Interaction between databases and concepts in Artificial Intelligence. Design projects undertaken. (F) Staff

220. Economics and Dynamics of Production. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 262A (may be taken concurrently). Statistics 134. Formerly 220 and 221. Modeling and analysis of production-service systems and engineering-economic systems. Emphasizing economic and engineering-economic systems, with emphasis on project evaluation and risk analysis. Econometric and programming models of production, dynamic systems and production networks for analyses of resource utilization and output possibilities. (F) Glassy

231. Forecasting and Time Series Analysis. (3) Two 1½ hours lectures and one 1-hour laboratory recitation per week. Prerequisites: 263A. Prediction and Forecasting Models for Decision Making. Emphasizes forecasting through the use of computational independence and influence diagrams; sensitivity analyses and the effect of different model assumptions upon the structure of the forecasts and decisions. The course includes a review of minimum mean-squared error forecasts, linear predictors and discrete time series formulations of autoregressive and moving average models. State-space and Bayesian Forecasting Models; Kalman Filters. (F) Oliver

240. Policy-Level Problems in Industrial Engineering. (3) Two hours of lecture and two hours of discussion per week. Prerequisites: 220. Mathematical and computer methods for production planning, scheduling, and control. Topics treated include: aggregate capacity planning, manufacturing requirements planning, lot size modeling, job shop scheduling; hierarchical linkage of production planning and control. (SP) Leachman

252A. Mathematical Programming I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 110. Basic graduate course in optimization techniques, including linear, integer-linear and non-linear systems. Mathematical programming and its drawbacks; solving a system of linear integer-equations and inequalities, strongly polynomial algorithms, network flow problems (including branching); polynomial optimization; branch and bound and lagrangean relaxation. (SP) Hochbaum

254. Process Planning and Scheduling. (3) Three hours of lecture per week. Prerequisites: IEOR 262A and 220. Mathematical and computer methods for production planning, scheduling, and control. Topics treated include: aggregate capacity planning, manufacturing requirements planning, lot size modeling, job shop scheduling; hierarchical linkage of production planning and control. (SP) Leachman

262A. Mathematical Programming I. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 110 or equivalent. The simplex method and its variants. Duality theory. Sensitivity analysis, parametric programming, convergence (theoretical and practical). Polynomial time algorithms. Introduction to network systems and flow networks. Optimality conditions for non-linear optimization problems. (F) Adler

262B. Mathematical Programming II. (3) Three hours of lecture per week. Prerequisites: Mathematics 110 or equivalent. The simplex method and its variants. Duality theory. Sensitivity analysis, parametric programming, convergence (theoretical and practical). Polynomial time algorithms. Introduction to network systems and flow networks. Optimality conditions for non-linear optimization problems. (F) Adler

263A. Applied Stochastic Process I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 134 or Statistics 200A. Conditional Expectation. Poloson and renewal processes. Renewal reward processes with applications 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,SP) Bartow, Wolff

265. Reliability Theory. (3) Three hours of lecture per week. Prerequisites: 263A (may be taken concurrently). A second year graduate course concerning system reliability analysis; coherent structures; fault tree analysis; efficiency of computational methods for calculating system reliability; properties and applications of life distributions with monotone failure rate; extreme value distributions; maintenance models; allocation of redundancy. (F) Barlow

266. Network Flows and Graphs. (3) Three hours of lecture per week. Prerequisites: 263A (may be taken concurrently). Solution of survey techniques and problems that have formulations in terms of flows in networks. Max-flow min-cut theorem. Minimum cost flows. Multicommodity flows. Relation of graph theoretical techniques 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 methods of solution, application to problems of equipment replacement, resource allocation, and other economic decision problems. Emphasis on development and testing of techniques for dealing with decision making under risk and uncertainty. (SP) Dreyfus

269. Integer Programming and Combinatorial Optimization. (3) Three hours of lecture per week. Prerequisites: 262A and 266. The course deals with discrete and combinatorial optimization problems. 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 branching); polynomial optimization; branch and bound and lagrangean relaxation. (SP) Hochbaum

271. Work Systems and Organization Design. (3) Three hours of lecture per week. Prerequisites: 171. Selected topics in design of systems for ensuring efficiency and effectiveness, human satisfaction, and productivity. Emphasis on team structure, participation, decision making, work graph autonomy.

280. Systems 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-economic systems. Participation in projects may be open to public or in the private sector, will be selected for detailed analysis and re-designed by student groups. (SP) Staff


290B. Dynamic Programming and Calculus of Variations. (3) Three hours of lecture per week. Prerequisites: 265 or equivalent. The necessary conditions of optimal control theory will be derived and interpreted, using dynamic programming.

290C. Statistical Aspects of Discrete Event Simulation. (2) Two hours of lecture per week. Prerequisites: 263A and 265. Development of statistical design and analysis of discrete event simulation of stochastic models. Methods of simulating random variables and stochastic processes: Variance estimation methods including the bootstrap technique. Variance reduction approaches including control variates, stratified sampling, importance sampling, conditional expectations, and the use of hazard variables will be studied. (F) Ross

290D. Bayesian Decision Analysis. (3) Two 1½ hours lectures per week. Prerequisites: 263A or equivalent. A Bayesian decision oriented course at the graduate level concerned with solving engineering problems of a statistical nature. Emphasis will be on using influence diagrams to model and solve problems in the design of experiments; multiobjective decision making, calibration of measuring instruments, quality assurance, etc.

290E. Large-Scale Programming. (3) Three hours of lecture per week. Prerequisites: 263A. Methods for efficiently solving the structural problems of large-scale optimization problems to economize on computer time and/or memory. Representations of the inverse that preserve sparseness. The simplex methods with updating and parallel optimization and reduction algorithms. Decomposition, Wolfe’s generalized linear program and column generation methods for linear and convex problems. Partitioning, relaxation and re-combination techniques. (SP) Adler

290G. Advanced Mathematical Programming. (3) Three hours of lecture per week. Prerequisites: 265A. Selected topics in mathematical programming. The actual subjects covered may include: Convex analysis, duality theory, complementary pivot theory, fixed point theory, optimization by vector space methods, ad-

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall

**Recalled to active service
**Recipient of Distinguished Teaching Award
vanced topics in nonlinear algorithms, complexity of mathematical programming algorithms (including linear programming).


*290L. Logistics Modeling. (2) Two hour lecture one hour laboratory per week. Prerequisites: 265, may be concurrent. Logistics covers. When and why materials, equipment, energy, and labor should be produced, stored, and transported. The objectives are to teach students how logistics systems operate; to develop analytical or systems models; and to use models to improve system operations. Systems will be covered, including carriers (trucks, railroads, and air), shippers, and manufacturers. Types of models covered include networks, analytical approximations, graphs, and physical models.

*290L. Neural-Net Modeling-Connectionism. (3) Three hours of lecture per week. Prerequisites: Mathematics 112, Statistics 134. Certain algorithms allow computers to learn to recognize patterns of input or data and to categorize input patterns. Discussion of how and why such algorithms work and examples of the behavior of such models. Drayles

290P. Pricing Policies. (2) One 2-hour lecture per week. Prerequisites: 252A, Economics 201A or consent of instructor. Examination of pricing related issues from economic systems and marketing perspectives. Analysis and optimal design for pricing policies for different industries. Discussion of market conditions compatible with various pricing policies and their implications for consumers and producers. Emphasis on mathematical analysis. Students will participate in presentations and prepare a term paper. (SP) Oren

290Q. Advanced Topics in the Theory of Queues. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 263A. Introduction to mathematical risk theory, with emphasis on various models of insurance operations: utility theory; insurance and gambling; individual indifference and elimination criteria; fairness; credibility theory; risk reserves; risk-sharing; objectives of the firm. (SP) Jewell

290R. Risk Theory. (3) Three hours of lecture per week. Prerequisites: 263A. Introduction to mathematical risk theory, with emphasis on various models of insurance operations: utility theory; insurance and gambling; individual indifference and elimination criteria; fairness; credibility theory; risk reserves; risk-sharing; objectives of the firm. (SP) Jewell

290S. Industrial Engineering and Operations Research. (1-4) Course may be repeated for credit. Seminars. Sections 1-4: S/U grading; sections 5-8: letter grading. Advanced study in industrial engineering and operations research. (F,SP) Staff

299. Individual Study or Research. (1-12) Course may be repeated for credit. Individual conferences. Sections 1-14: S/U grading; sections 15-40: letter grading. Individual investigation of advanced industrial engineering and operations research problems. (F,SP) Staff

601. Individual Study for Master's Students. (1-12) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (and other doctoral degrees). May not be used for unit or residence requirements for the doctoral degree. (F,SP) Staff

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: text selection, clarity of oral delivery, use of visual aids, media resources; discussion hours. (F,SP) Staff

Integrative Biology

(University of Letters and Science)

Department Office: 345 Muiford Hall, 642-2818
Graduate Student Services: 345 Muiford Hall, 642-7262
Graduate Student Services: 347 Muiford Hall, 642-5130 (Admissions)
Graduate Student Services: 345 Muiford Hall, 642-5204 (Graduate Assistant)
Chair: Marvella H. Wake, Ph.D.
Professor: George W. Barlow, Ph.D. University of California at Los Angeles. Epidemiology. Evolutionary biology.
William B. N. Berry, Ph.D. Yale University. Paleozoic, palaeonanotogy, community palaeontology.
R. T. Caldwell, Dr. University of Iowa. Invertebrate paleobiology. Dr. Stuart Chapin, Ph.D. Stanford University. Physiological ecology.
T. M. C. Diamond, Ph.D. University of California. Neuroanatomy, environment, asymmetry, hormones. Dr. Carola Hickman, Ph.D. Ohio State University. Invertebrate functional morphology.
N. T. Jones, Ph.D. University of California at Berkeley. Chronology and evolutionary biology.
N. T. Jones, Ph.D. University of California at Berkeley. Chronology and evolutionary biology.
Paul Licht, Ph.D. Michigan. Comparative physiology and endocrinology.
William Z. Liddick, Jr., Ph.D. University of Illinois at Urbana-Champaign. Mammary and evolutionary biology.
Jere H. Lilip, Ph.D. University of Los Angeles. Paleontology of marine environment.
Cara B. Nicol, Ph.D. Michigan State University. Hormone, growth regulation and cancer.
Robert Omdurf, Ph.D. University of California at Berkeley. Systematics, reproductive biology.
James L. Patton, Ph.D. University of Arizona. Mammary and evolutionary biology.
Thelema E. Rowell, Ph.D. Cambridge University. Primate behavior and reproduction cycles.
Chopin, S. S. McKean, Ph.D. Harvard University. Evolutionary theory and biology.
Morgan W. Stieglitz, Ph.D. Harvard University. Evolutionary biology.
Glengary Thomson, Ph.D. University of Melbourne. Mathematical human population genetics.
James W. Rightmire, Ph.D. University of Los Angeles. Paleontology and evolutionary biology.
David B. Wake, Ph.D. University of Southern California. Vertebrate evolutionary morphology and reproduction biology.
Howard A. Barn, Ph.D. University of California at Los Angeles. Endocrinology and tumor biology.
Lincoln Constance (Emeritus), Ph.D. University of California at Berkeley. Systematics.
Joseph T. Gregory (Emeritus), Ph.D. University of California at Berkeley. Paleobotany and evolutionary biology.
Cedric A. Bruggeman, Ph.D. University of California at Berkeley. Systematics and cytogenetics.
O. L. Pearson (Emeritus), Ph.D. Harvard University. Physiological ecology.
Donald E. Oldham, Ph.D. University of California at Berkeley. Mammalian paleontology and the environment.
Ralph L. Smith (Emeritus), Ph.D. Harvard University. Invertebrate zoology and comparative paleontology.
Robert C. Stebbins (Emeritus), Ph.D. University of California at Los Angeles. Herpetology and natural history.
Kevin Pedel, Ph.D. University of California. Paleobiology of lower vertebrates.
Rodolf Schmid, Ph.D. University of Michigan. Comparative morphology of vascular plants.
John D. Simmons, Ph.D. Rice University. Parasitology.
Wayne P. Soss, Ph.D. University of California at Santa Barbara. Marine ecology.
Seth B. Beno (Emeritus), Ph.D. University of California at Berkeley. Mammalogy.
Wayne L. Fly (Emeritus), Ph.D. Cornell University. Palaeobotany, paleoenvironments of plants.
Assistant Professors:
Carla D'Antonio, Ph.D. University of California at Santa Barbara. Plant population biology.
Robert J. Full, Ph.D. Stanford University of New York, Buffalo. Comparative animal physiology.
Mary E. Power, Ph.D. University of Washington. Freshwater ecology.

Graduate Advisers:
Nancy A. Brooks, Ph.D. University of California at Berkeley. Zoology.
Lawrence B. Koepf, Ph.D. University of California at Berkeley. Behavioral ecology and population biology.
David J. Lipps, Ph.D. University of California at Santa Cruz. Vertebrate paleontology.

*290U. Undergraduate Advisers:
Marcos B. S. Maborsky, Ph.D. University of California at Berkeley. Vertebrate paleontology.
Mary, Ph.D. University of California at Berkeley. Vertebrate paleontology.
Robert J. Full, Ph.D. University of California at Berkeley. Vertebrate paleontology.

Undergraduate Program

The department of Integrative Biology offers a program of instruction that focuses on the integration of biology of structure and function in the evolution of diverse biological systems. It investigates integration at all levels of organization from molecules to the bio-sphere, in all taxa of organisms from viruses to higher plants and animals. The department has special strength in the disciplines of morphology, organismal physiology, ethology, ecology, systematics, biology, paleontology, and evolution. A basic one-year course in biology of structure and function is mandatory. Certain algorithms allow computers to learn to recognize patterns of input or data and to categorize input patterns. Discussion of how and why such algorithms work and examples of the behavior of such models. Drayles
The Major

Lower Division. Required of all students in the major: Biology 1A (4), Biology 1B (4); Chemistry 1A (4), Biology 4 (4), 8A (3); Mathematics 16A (3); Physics 8A (4), 8B (4). More extensive preprofessional courses may be substituted for those listed, at the student's option, keeping in mind that additional course work in mathematics, statistics, biochemistry, the history of biology, and foreign language(s). Courses in entomology, forestry, etc., may be substituted in the major at the discretion of the adviser.

Upper Division. Required of all students in the major (at least three of these five core requirements should be fulfilled by integrative biology courses):

1. A course in general genetics and/or evolution.
   Options: IB 160 (4), IB 161 (3), IB 162 (3), MCB 140 (4), MCB 140L (4), MCB 142 (3).

2. A course in morphology and/or development.
   Options: IB 110 (2)/104L (2), IB 111 (2)/111L (2), IB 130 (4)/103L (2), IB 131 (3)/131L (2), MCB 131 (3), PB 100A (4).

3. A course of at least 3 units in organismal physiology.
   Options: IB 132 (4)/132L (2), IB 136 (4), IB 140 (4), IB 148 (3)/148L (1), IB 150 (3)/150L (3), IB 151 (3)/151L (3), MCB 160 (4)/160L (2), PB 100B (4), PB 140L, Entom. Sci. 103 (3)/103L (2), Psych. 116 (3).

4. Two courses totalling at least 6 units in organismal diversity. At least one course must have a regular laboratory component, and at least one course must have a field component. It is recommended that both plant and animal diversity be included.
   Options: IB 101 (2)/101L (2), IB 102 (2)/102L (2), IB 103 (3)/103L (2), IB 104 (3)/104L (2), IB 133 (4)/133L (2), IB 134 (3)/134L (2), IB 168 (2)/168L (2), IB 176 (2)/176L (3), IB 181 (2)/181L (3), IB 182 (2)/182L (3), IB 183 (2)/183L (1), PB 110 (4), PB 120 (4), Entom. Sci. 100 (4).

5. A course of at least 3 units in ecology and/or behavior. It is recommended that both fields be included in programs whenever possible.

In consultation with an adviser, additional upper division biology courses and upper division science units or open elective units may be included in the major. In addition to the laboratory course specified in area 4 above, at least two additional upper division laboratory courses must be taken. It is recommended that majors include courses in both animal and plant biology in their programs. The department offers two general paths or areas of emphasis within the major as well as the opportunity to specialize in a large variety of areas. Emphasis A: Integrative Human Biology. This choice may appeal to students interested in pursuing health-related professions or careers in other fields allied to human biology (e.g., psychology, sociology, demography, political science, resource management). Emphasis B: General Integrative Biology. This choice is for majors interested in organisms generally, including those looking for degrees in a broad course of study in areas such as marine biology, paleontology, behavioral biology, environmental sciences, ecology, physiology, morphology, systematics, evolution, and development. Good preparation for students majoring in the health professions and preparing careers requiring graduate-level studies in biology or related fields (e.g., medicine). Students in the major with a B average or better are encouraged to seek faculty sponsorship for independent study and research under course 199.

Note: Transfer students with 56-70 units must have had general chemistry and general biology.

Those with 71-80 units must have had, in addition, organic chemistry.

Honors Program. Students with a GPA of at least 3.3 overall and in the major may enter the honors program. In order to qualify for honors, students must consult the Honors Program Office in order to be considered for honors admission. Students must find an appropriate faculty sponsor for the work they wish to do and enroll in two seminars (4-6 units) of the honors thesis course (H196A-H196D). They must also complete a graduate seminar related to the subject matter of their honors work and must present the results of that work in the form of a written report, the Honors Thesis. In order to graduate with honors, students must finish their work 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 had the equivalent of a major in a biological science. However, students with other appropriate backgrounds are encouraged to enter the program. The Department of Integrative Biology offers the M.A. by thesis or examination plan, details of which may be obtained from the department office. The program for the Ph.D. varies considerably, according to the background and interests of students. All students must pass the Ph.D. must pass an oral qualifying examination. The crucial part of the Ph.D. program is the thesis, based upon original research in which the candidate demonstrates the ability to conduct independent study and to incorporate the results in a thesis. Service as a graduate student instructor is normally required as part of the Ph.D. program in integrative biology. Details of the Ph.D. program may be obtained from the department office.

Research Facilities

The Botanical Garden in Strawberry Canyon provides opportunities for research with living plants, subject to supplies and space available. The garden is open to the public and serves as an outdoor laboratory for students. Its collections are especially rich in succulents and South American, South African, European, and Australian plants, and is being developed with the approval of the Director, Botanical Garden, University of California at Berkeley; Berkeley, CA 94720.

The Cancer Research Laboratory is a research institute on the Berkeley campus that carries on a research, teaching, and service program designed to foster interdisciplinary research in cancer research. Some of the Department of Integrative 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, immunology, cell biology, endocrinology, genetics, immunology, molecular biology, and tumor virology. Those interested in the laboratory's program may address inquiries to the Director, Cancer Research Laboratory, University of California at Berkeley; Berkeley, CA 94720.

The Field Station for Behavioral Research is a research facility that supports research in marine, freshwater, and terrestrial animals. It has a large and growing collection of mammals, birds, reptiles, and amphibians. Research activities center on problems in evolutionary biology, with emphasis on systematics, evolutionary morphology, genetics, and biogeography, and conservation. The museum serves many educational functions and houses a number of graduate students. The museum is under the direction of the Frances Simes Hastings Natural History Reservation in upper Carmel Valley. The flora and fauna of the 2,000-acre tract are protected for study of ecological relations in undisturbed communities. Graduate and undergraduate students and qualified visitors may pursue advanced studies and use the facilities of the museum and reservation under the sponsorship of a member of the museum staff. Persons interested may write to the Director, Museum of Vertebrate Zoology, University of California at Berkeley; Berkeley, CA 94720, or Dr. Mark Stromberg, in charge of Hastings Reservation, Carmel Valley, CA 93924.

The combined University and Jepson Herbaria offer a world-wide, floristic reference collection and library that form a foundation for basic research in systematic botany, ecology, phyto- geography, and evolution, not only for faculty, staff, and students but also for visiting scholars and biologists. Inquiries should be addressed to the Director, The University Herbarium, Berkeley, CA 94720.

Lower Division Courses

Biology 1B. General Biology. (4) Three 1-hour lectures, one 3-hour laboratory, and one hour discussion per week. Prerequisites: Chemistry 1A-1B. General introduction to plant development, form and function; population genetics, ecology, and evolution. Intended for students majoring in the biological sciences, but open to all qualified students. Students must take both Biology 1A and 1B to complete sequence. Sponsored by Integrative Biology. (F,SP) Lidicker, Thomson, Schmid (F), Patton, Feldman, Resh (SP)

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. Neither is a prerequisite for the other.

Biology 11. Introduction to the Science of the Living Organisms. (4) This course is jointly taught by Integrative Biology. For course description see sections on Biology or Plant Biology.)
15. Plant and Fungal Biology. (2) Students with credit for Botany 10 may not receive credit for 15. Two 1-hour lectures per week. Prerequisites: None. Open without pre-requisite to all students and designed for those not specializing in the biological sciences. Formerly lecture portion of Botany 10. Formerly Botany 101. An introduction to the structure and function of plants and fungi. (SP) Schmid

15L. Laboratory in Plant and Fungal Biology. (1) Students with credit for Botany 10 may not receive credit for 15L. One 2-hour laboratory per week. Prerequisites: None. Open without pre-requisite to all students and designed for those not specializing in the biological sciences. Formerly laboratory portion of Botany 10. Laboratory study of structure and function of plants. (SP) Schmid

16. Vertebrate Adaptation. (2) Two hours of lecture per week. Prerequisites: Open without pre-requisite to all students and designed for those not specializing in Paleontology. Formerly Paleontology 2H. Vertebrate evolution (from jawless fish to birds, dinosaurs, and mammals) emphasizing the diversity of adaptation. Topics will include evolutionary theory, reconstructing fossil animals and their environments, feeding specializations, locomotion, extinctions, and human evolution. (F) Light

20. Animal Biology. (3) Three 1-hour lectures and one hour of discussion per week. Prerequisites: Open to all students, but designed for those not specializing in biology. Formerly Zoology 15. Principles and concepts of animal biology introduced through selected topics at the cellular, structural, and population levels of organization. (F) Licht

31. Animal Biology: A Behavioral View. (3) Students who have taken Integrative Biology 145, or IDS 122 will receive no credit. Two 1-hour lectures, 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. (SP) Caldwell

32. Primate Biology. (2) Two hours of lecture per week. Formerly Zoology 14. An introduction to the order of mammals of which we are members. Special emphasis on ecology, behavior, and reproductive biology.

33. Topics in Paleontology: The Age of Dinosaurs. (3) More than one course in the series 33, 34, 81 may be taken for credit with consent of instructor. Two 11/2-hour lectures and one hour of discussion per week. Formerly Paleontology 2A. 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 earliest mammals and birds. (F) Padian

34. Topics in Paleontology: The Age of Mammals. (2) More than one course in the series 33, 34, 81 may be taken for credit with the consent of instructor. Two 1-hour lectures per week. Formerly Paleontology 2E. Open without prerequisite to all students and designed for those not specializing in paleontology. An introduction to the age of mammals emphasizing evolutionary theory, adaptation, mammalian diversity through time, and current issues in mammalian paleontology.

35. People in the Tropics. (2) Formerly Zoology 12. Two 1-hour lectures per week.Prerequisites: Designated for those not specializing in biology. Natural history of humans in the tropics with emphasis on ecological relations between humans and other species. (SP)


39. Topics in Integrative Biology. (1) One discussion (1-2 hours) per week. Must be taken on a passed/not passed basis. Prerequisites: Preferentially open to freshmen; consent of instructor is required. (F) Wick

60. Evolutionary Biology—An Introduction for Non-Biology Majors. (2) Two 1-hour lectures and one hour of discussion per week. Formerly IDS 16. This course assumes knowledge of 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.

80. Life, Climates and Ecologies of the Past. (2) Two hours lecture per week. Formerly Paleontology 15. Changes in plant and animal associations and interrelationships are traced in the context of environmental and climatic changes that took place through out geologic time. Emphasis placed on using knowledge of modern ecological relationships to understand those of the past. (F) Barry

81. Topics in Paleontology: Ancient Landscapes. (1) More than one course in the series 33, 34, 81 may be taken for credit with consent of instructor. One 1-hour lecture per week. Formerly Paleontology 2C. Open without prerequisite to students and designed for those not specializing in paleontology. An overview of fossil land plants from the last 400 million years with emphasis on reconstructions of ancient forests and the environments they live in.

82. Introduction to the Oceans. (2) Two hours lecture per week. Prerequisites: To have had one of the following courses at a high school level: physics, chemistry, biology is recommended. Formerly Pal eontology 25. Formerly Zoology 10. Marine biology and bi ology of the world oceans. The 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. (F) Lips

99. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: GPA of 3.4 or greater. Formerly Botany 99. Principles of independent study and research intended for the academically superior student. Enrollment only with prior approval of faculty advisor directing the research. (F,SP) Staff

Upper Division Courses

101. Diversity of Plants and Fungi. (2) Two 1-hour lectures per week. Prerequisites: Biology 1A, 1B. Must be taken concurrently with 101L. Formerly lecture portion of Botany 100. An introduction to the principles of ecology, stressing the structure and dynamics of natural ecosystems. Designed for students who have not had Biology 1B.

102. Laboratory in Plant and Fungal Biology. (2) Two 3-hour laboratories per week plus several weekend field trips. Prerequisites: Biology 1A, 1B. Must be taken concurrently with 101L. Formerly Zoology 107. An introduction to the collections, facilities, and programs of the University Botanical Garden.

103. Invertebrate Zoology. (3) Three 1-hour lectures per week. Prerequisites: Biology 1A, 1B. Must be taken concurrently with 103L. Formerly Zoology 108. An introductory survey of the biology of invertebrates, stressing comparative functional morphology, phylogeny, natural history, and aspects of physiology and development. (SP) Koehl

103L. Invertebrate Zoology Laboratory. (2) Two 3-hour laboratories per week plus several weekend field trips. Prerequisites: Biology 1A, 1B. Must be taken concurrently with 103. Formerly Zoology 188. Laboratory study of invertebrate diversity and functional morphology, and field study of the natural history of local marine invertebrates. (SP) Koehl

104. Natural History of the Vertebrates. (3) Two 1-hour lectures per week. Prerequisites: Must be taken concurrently with 104L. Formerly Zoology 107. Biology of the vertebrates, exclusive of fish. (SP) Lidicker, Johnson, Greene, Patton

104L. Vertebrate Natural History Laboratory. (2) One 3-hour laboratory and one 4-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) Lidicker, Johnson, Greene, Patton

105. General Ecology. (3) Two 1-hour lectures and two 3-hour laboratories per week. Prerequisites: Biology 1A or 11 or equivalent. Formerly Biology 150. An introduction to the principles of ecology, stressing the structure and dynamics of natural ecosystems. Designed for students who have not had Biology 1B.

108. Principles of Paleontology. (3) Three 1-hour lectures per week. Prerequisites: A course in paleontology, or a related science. Formerly Biology 101. An introduction to principles and methods in paleontology and paleobiology. Topics include the nature of fossil data; approaches and problems in the various branches of paleontology; fossil animals, species, and clades; macroevolution; and functional morphology and paleoecology. (SP) Hickman, Padian

110. Evolutionary Morphology of Land Plants. (2) Two 1-hour lectures per week. Prerequisites: 101 and 101L recommended. Biology 1A, 1B. Must be taken concurrently with 110L. Formerly laboratory portion of Botany 110. An analysis of the evolution and comparative morphology of vascular plants studied from the viewpoint of both fossil and living representatives.

110L. Laboratory in the Evolutionary Morphology of Land Plants. (2) Two 2-hour laboratories per week. Prerequisites: 101, 101L. Formerly Botany 115. Must be taken concurrently with 110. Formerly laboratory portion of Botany 110. Laboratory for 110.

111. Anatomy of Vascular Plants. (2) Two 1-hour lectures per week. Prerequisites: 101, 101L; Biology 1A, 1B. Must be taken concurrently with 111L. Formerly laboratory portion of Botany 112. A consideration of the functional and developmental aspects of cell, tissue, and organ structure of plants, including their adaptations to ecological factors such as pollination, dispersal, and water availability.

111L. Laboratory in the Anatomy of Vascular Plants. (2) Two 2-hour laboratories per week. Prerequisites: 101, 101L; Biology 1A, 1B. Must be taken concurrently with 111L. Formerly laboratory portion of Botany 112. Laboratory for 111.

120. Plants and Civilization. (3) Two 1-hour lectures and two hours of demonstration per week. Prerequisites: A course of high school or college biology or its equivalent. Formerly Botany 135. Man's selection and use of plants for his own purposes and the interrelation between the evolution of domesticated plants and the cultural evolution of man.

121. The Botanical Garden. (2) Three 1-hour lectures per week. Must be taken on a passed/not passed basis. Prerequisites: Formerly Botany 121. Formerly lecture portion of Botany 128 & IB 121L. An introduction to the collections, facilities, and programs of the University Botanical Garden.
130. Evolutionary and Functional Vertebrate Anatomy. (4) Three 1-hour lectures and one hour of discussion per week. Prerequisites: Biology 1A, 1B. Must be taken concurrently with 130L. Formerly Zoology 106. The structure and function of vertebrates; analysis of patterns of evolution of vertebrates using morphological data and the comparative method.

130L. Evolutionary and Functional Vertebrate Anatomy Laboratory. Two 3-hour laboratories per week. Prerequisites: Biology 1A, 1B. Must be taken concurrently with 130. Formerly Zoology 176. Laboratory on the structure and function of vertebrates; analysis of patterns of evolution of vertebrates using morphological data and the comparative method.

131. General Human Anatomy. (3) Three 1-hour lectures per week. Prerequisites: Biology 1A, 1B or Chemistry 1A-1B. 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

131L. General Human Anatomy Laboratory. (2) One 4-hour laboratory per week. Prerequisites: Biology 1A, 1B or Chemistry 1A-1B. Concurrent enrollment with 131 or following 131 required. Formerly Anatomy 108L. Prepared human dissections, models and microscopic slides. (SP) Diamond

132. Survey of Human Physiology. (4) Students who have taken the former Physiology 100 or 101 or the current MCB 120 will receive no credit for 132. Two 1/2-hour lectures and one hour discussion per week. Prerequisites: 131; Formerly Physiology 109. Mechanisms of human life processes; study of function of cells, tissues and organs systems. (SP) Nicoll

132L. Laboratory of Mammalian Physiology. (2) Students who have taken the former Physiology 100 or 101 or the current MCB 120 will receive no credit for 132L. One 1-hour lecture and one 3-hour laboratory per week. Prerequisites: Formerly Physiology 109L. Laboratory experiments demonstrating the functional mechanisms underlying life processes in mammalian systems. (SP) Nicoll

133. Anatomy Enrichment Program. (2) Course may be repeated for credit. Field work - minimum of four hours per week arranged. May 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 UCSB students work in groups of 2-3 to plan their presentations of the systems of the body and then enter the school rooms to teach what they have learned in 131. (SP) Diamond

134. Paleoeology and Functional Morphology. (3) Two 1/2-hour lectures per week. Prerequisites: Consent of the Instructor. Must be taken concurrently with 134L. Formerly lecture portion of Paleontology 112. Paleobiology approaches to the interpretation of morphology and techniques for studying the functions of fossil individuals, populations, and communities. Ancient paleoecological patterns and processes are considered in terms of modern ecological and evolutionary theory, with examples from both marine and terrestrial systems. (F) Hickman

134L. Paleoeology and Functional Morphology Laboratory. Two 1/2-hour laboratories per week. Prerequisites: Consent of the Instructor. Must be taken concurrently with 134. Formerly laboratory portion of paleontology 112. Laboratory in paleobiological approaches to the interpretation of morphology and techniques for studying the functions of fossil individuals, populations, and communities. Examples from both marine and terrestrial systems. Theory, with examples from both marine and terrestrial systems. (F) Hickman

135. The Mechanics of Organisms. (3) Three hours of lecture per week. Prerequisites: Senior standing and Biology 1A and 1B. Formerly Zoology 124. Functionalmorphology and functional anatomy in terms of mechanical design principles: basics of fluid and solid mechanics with examples of their biological implications, stressing the dependence of mechanical behavior on the structure of molecules, tissues, organs, and organisms, whole organisms, and habitats. (F) Koeht

137. Cytology. (3) Three 1-hour lectures and one hour discussion per week. Prerequisites: Biology 1A, 1B or equivalent. Formerly Zoology 110. Cell structure, function, and variation. Methods studying cells and their organisms from a historical perspective. Mitosis, meiosis, sex determination, introduction to cyto genetics, chromosome changes in evolution.

137L. Cytology Laboratory. (2) Three 1-hour laboratories per week. Prerequisites: A course in cytology, zoology and microbiology; formerly Zoology 110L. Comparative study of cell types and organelles; determination of the cell cycle; selected staining and preparatory methods.

138. Biology of Chemical Mediation. (4) Three 1-hour lectures and one hour discussion per week. Prerequisites: Consent of instructor. Formerly Zoology 128. A survey of the role of chemical mediators in biology; from hormones and neurotransmitters to microbial toxins. Some chemical systems and their evolutionary significance.

138L. Biology of Chemical Mediation Laboratory. (1) One 3-hour laboratory per week. Prerequisites: Previous or concurrent enrollment in 138. Formerly Zoology 128L. An introduction to the study of physiological systems among animal phyla. General physiological principles will be studied in the context of their ecological correlates, evolutionary theories, and behavioral mechanisms.

140. Comparative Animal Physiology. (4) Three 1/2-hour laboratories and one hour discussion per week. Prerequisites: Biology 1A, 1B or equivalent. Formerly Zoology 128. Comparative animal physiology with emphasis on adaptations to the physical environment, such as gases, temperature, and water and ions. (SP) Full, Nicole

153L. Laboratory in Population and Community Ecology. (3) Two 3-hour laboratories and one 1-hour discussion per week. Prerequisites: Previous or concurrent enrollment in 148L. Biology 1A, 1B. Basic laboratory techniques and experiments comparing physiological systems among animal phyla.

155. Physiological Ecology of Animals. (3) Three 1/2-hour lectures and one hour discussion per week. Prerequisites: Biology 1A, 1B or equivalent. Formerly Zoology 128. Comparative animal physiology with emphasis on adaptations to the physical environment, such as gases, temperature, and water and ions. (SP) Full, Nicole

155L. Animal Physiological Ecology Laboratory. (3) Two 3-hour laboratories and one 1-hour discussion per week. Prerequisites: Previous or concurrent enrollment in 148L. Biology 1A, 1B or equivalent. Formerly Zoology 178. An introduction to the measurement of physiological responses to environmental stresses. (SP) Full

151. Plant Physiological Ecology. (3) Three 1-hour lectures per week. Prerequisites: Biology 1B or consent of instructor. Formerly Zoology 135. An introduction to the physiological adaptations by which plants cope with their physical and environmental conditions, considering both the physiological adjustments made by individual plants and the adaptive responses of entire plant communities. We will begin with the physiological adjustments to environmental stresses (water, nutrients, light, and temperature) and then will consider the physiological bases of competitive and mutualistic interactions between plants, animals and microorganisms.

151L. Plant Physiological Ecology Laboratory. (1) One 3-hour laboratory per week; one weekend field trip. Prerequisites: Concurrent enrollment in 151 or consent of instructor. The course will introduce the student to the techniques and approaches of plant physiological ecology, using modern equipment. The course will then use the experimental approaches learned in the lab exercises to address an unanswered question related to an area of interest. We will examine cases of physiological traits which enable plants to adapt to California's diverse environments?

153A. Ecology of Biological Populations. (3) Two 1/2-hour lectures and one hour discussion per week. Prerequisites: Biology 1B or consent of instructor. Principles of ecological and evolutionary theory, population processes, life histories, and community structure, using examples from terrestrial, freshwater, and marine habitats. Topics will include quantitative approaches relying on algebra and elements of calculus. Discussion section will review recent literature in ecology. (F) Chapin, Power, Sousa

153B. Ecology of Biological Communities. (2) Two 1-hour lectures and one hour discussion per week. Prerequisites: 153A or consent of instructor. Consideration of the roles of physical and biological processes in structuring natural communities of microbes, plants, animals. Observational, experimental, and theoretical approaches will be discussed, with examples from terrestrial, freshwater, and marine habitats. Discussion section will review recent literature in ecology. (SP) Power, Sousa

153L. Laboratory in Population and Community Ecology. (3) Two 4-hour laboratories per week, plus 2-3 weekend field trips. Prerequisites: 153A or 153B (may be taken concurrently) or consent of instructor; introductory course in statistics strongly recommended.

153L. Laboratory in Population and Community Ecology. (3) Two 4-hour laboratories per week, plus 2-3 weekend field trips. Prerequisites: 153A or 153B (may be taken concurrently) or consent of instructor; introductory course in statistics strongly recommended.

153L. Laboratory in Population and Community Ecology. (3) Two 4-hour laboratories per week, plus 2-3 weekend field trips. Prerequisites: 153A or 153B (may be taken concurrently) or consent of instructor; introductory course in statistics strongly recommended.
Introduction to field and laboratory study of ecological patterns and processes in nature. Course begins with a series of experiments conducted in local terrestrial, aquatic, and marine habitats. These exercises emphasize sampling methodology, experimental design, and statistical interpretation of results. Latter half of course emphasizes application of research protocols. A written report and class presentation of project results are required.

**153X. Ecology of Biological Populations and Communities.** (3) Course may be repeated for credit. Two 1/2-hour lectures and two 1-hour discussions per week. Prerequisites: Biology 13 or consent of instructor. Principles of microbial, plant, and animal population ecology, illustrated with examples from marine, freshwater and terrestrial habitats. Consideration of the roles of physiological 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 session will review recent literature in ecology.

154. Plant Ecology. (2) Two 1-hour lectures per week. Prerequisites: Biology 1A and 1B. Formerly Botany 154. A general consideration of the principles of plant ecology and organisms, interactions, and communities. Topics include plant water relations and carbon balance, plant/animal interactions, population dynamics, and community structure and development. (SP) Chapin

154L. Laboratory in Plant Ecology. (3) One 4-hour laboratory per week plus three 1-day field trips. Prerequisites: Biology 1B or consent of instructor. Formerly Botany 154L. Laboratory for 154 (Plant Ecology). (SP) Chapin

160. Evolution. (4) Three 1-hour lectures and one hour discussion per week. Prerequisites: Biology 1A, 1B, Molecular Genetics 142 or equivalent. Formerly Zoology 109. A course in evolutionary theory, with emphasis on basic processes, selection theory, adaptive responses, and patterns of speciation and phylogenesis. (SP) D. Wake

**161. Population Genetics and Evolution.** (4) Three 1-hour lectures and one 1-hour discussion per week. Prerequisites: Biology 1A, 1B and Chemistry 8A. Formerly Genetics 100C. A survey of basic ideas in population genetics including elementary theory, experimental population genetics and computer simulation. The emphasis will be on the relationship between population genetics and evolutionary biology.

**162. Quantitative Methods in Evolutionary Biology.** (3) Two 1/2-hour lectures per week. Prerequisites: One year of college level mathematics (calculus) and a course in population genetics or evolution. Formerly Zoology 104. A survey of mathematical and statistical techniques used in evolutionary biology. Topics include quantitative genetics, demographic models in paleontology, clustering and similarity measures, and methods of phylogenetic reconstruction. The emphasis will be on the assumptions made in using these methods, the techniques for actually using them, and the kinds of conclusions that can be drawn.

**163. Evolution Above the Species Level.** (2) Two 1/2-hour lectures per week. Prerequisites: 160 or consent of instructor. Formerly Paleon 103. Processes and patterns of evolution outside the realm of population biology: the explanation of diverse modern life-forms; rates of speciation, morphologic changes and protein evolution; origins of major groups and adaptations, rates and causes of extinctions; and the determinants of morphology. This course will be open to the applicability of paleontological and neontological theory to the fossil record and to the living world.

**166. Biogeography.** (3) Two 1/2-hour lectures per week. Prerequisites: Senior or graduate standing. Principles underlying patterns of plant and animal distribution, based on critical analysis of evidence from selected groups, with special attention to earliy history, vicariant processes, the action of barriers, dispersal, colonization, and extinction.


**169L. Systematics of Vascular Plants Laboratory.** (2) Two 3-hour laboratories per week. Prerequisites: 101, 101L recommended; Botany 1A, 1B, Must be taken concurrently with 168L. A laboratory course devoted to a survey on a world-wide basis of vascular plant families.

172. Advanced Primates Biology. (4) Three 1-hour lectures and one half hour discussion per week. Prerequisites: Anthropology 1 or Biology 1. The adaptive radiation of this most diverse order of mammals. The distribution of primates in some ecosystems; their anatomical and behavioral specializations and their role as indicator species in conservation. The mechanisms and diversity of primate social organization compared with that of other mammals. (F) Rowell

173. Mammalogy. (2) Two hour lectures per week. Prerequisites: Must be taken concurrently with 172L. Formerly Zoology 163. An advanced lecture course in the biology of mammals. (F) Patton, Lidicker

173M. Mammalogy Laboratory. (3) Two 3-hour laboratories/week plus two 3-day field trips. Prerequisites: 104. Formerly Zoology 163L. An advanced laboratory and field course in ecology and diversity of mammals. (F) Patton, Lidicker

174. Ornithology. (2) Two hours lecture per week. Prerequisites: 104 or consent of instructor. Formerly Zoology 164. An advanced course in the biology of birds.

174L. Ornithology Laboratory. (2) Two 3-hour laboratories/week plus one weekend field trip. Prerequisites: Must be taken concurrently with 174L. Formerly Zoology 184. An introduction to the diversity, morphology, and general ecology of birds of the world.

175. Herpetology. (2) Two 1-hour lectures 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, final) and an independent research paper.

175L. Herpetology Laboratory. (2) Two 2-hour laboratories/per week plus two field trips. Prerequisites: 104. Must be taken concurrently with 175L. Formerly Zoology 165L. Laboratories will teach students the diagnostic characteristics and tribal 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.

176. Ichthyology. (2) Two 1-hour lectures per week. Prerequisites: 130, 104 recommended; Biology 1A, 1B, Must be taken concurrently with 176L. Should be taken suddenly with 176L unless 176L is over subscribed. Formerly Zoology 166. A basic course in the natural history and phylogeny of fishes. (F) Barlow

176L. Laboratory in Ichthyology. (3) Two 3-hour laboratories per week plus three days of 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. (F) Barlow

180. Micropalaeontology. (2) Two 1-hour lectures per week. Prerequisites: 182 and 182L; a course in Marine Geobiology is recommended. Must be taken concurrently. Formerly lecture portion of Paleontology 115. Marine Protista that are common in the fossil record. Formerly laboratory portion of Paleontology 115. Laboratory demonstrating and studying marine protista of the fossil record, including planktonic benthic and larger foraminifera, radiolarians, diatomellae, and coccolithophores. Taxonomy, evolution, stratigraphy, biogeochemistry, paleoecology, preservation, and research applications will be the focus. (SP) Lips

180L. Micropalaeontology Laboratory. (3) Two 3-hour laboratories per week. Prerequisites: 182 and 182L; 185 Recommended. Must be taken in conjunction with 180. Formerly laboratory portion of Paleontology 115. Laboratory demonstrating and studying marine protista of the fossil record, including planktonic benthic and larger foraminifera, radiolarians, diatomellae, and coccolithophores. Taxonomy, evolution, stratigraphy, biogeochemistry, paleoecology, preservation, and research applications will be the focus. (SP) Lips

181. Origin and Evolution of Plants. (2) Two 1-hour lectures per week. Prerequisites: Courses in Paleontology and or Botany. Must be taken concurrently with 181L. Formerly lecture portion of Paleontology 120. Advanced study of plants found in the fossil record. Formerly laboratory portion of Paleontology 130. Formerly Biology 181. Fossil evidence for plant origins will be examined.

182. Invertebrate Paleontology. (2) Two 1-hour lectures per week. Prerequisites: Must be taken concurrently with 182L. Formerly lecture portion of Paleontology 111. Laboratory in invertebrate paleobiology, with practical study of their uses in ecosratigraphy and chronostatigraphy.

182L. Invertebrate Paleontology Laboratory. (3) Two 3-hour laboratories per week. Prerequisites: Must be taken concurrently with 182L. Two 3-hour laboratories per week. Prerequisites: Biology 1B, introductory courses in earth history and vertebrate zoology recommended. Formerly lecture portion of Paleontology 125. An introduction to vertebrate paleontology, focusing on the history and phylogeny of vertebrates ranging from fishes to man. Emphasis on evolution, taxonomy functional morphology, faunas through time, and problems in vertebrate history, including diversity through time and extinction.

183L. Vertebrate Paleontology Laboratory. (1) Must be taken concurrently with 183L. Two 1-hour lecture per week. Prerequisites: Biology 1B, introductory courses in earth history and vertebrate zoology recommended. Formerly laboratory portion of Paleontology 111. Laboratory in invertebrate paleobiology, with practical study of their uses in ecosratigraphy and chronostatigraphy.

183. Vertebrate Paleontology. (2) Must be taken concurrently with 183L. Two 1-hour lecture per week. Prerequisites: Biology 1B, introductory courses in earth history and vertebrate zoology recommended. Formerly laboratory portion of Paleontology 125. An introduction to vertebrate paleontology, focusing on the history and phylogeny of vertebrates ranging from fishes to man. Emphasis on evolution, taxonomy functional morphology, faunas through time, and problems in vertebrate history, including diversity through time and extinction.

185L. Vertebrate Paleontology Laboratory. (1) Must be taken concurrently with 185L. Two 1-hour lecture per week. Prerequisites: Biology 1B, introductory courses in earth history and vertebrate zoology recommended. Formerly laboratory portion of Paleontology 111. Laboratory in invertebrate paleobiology, with practical study of their uses in ecosratigraphy and chronostatigraphy.

185. Marine Geobiology. (2) Two 1-hour lectures per week. Prerequisites: 182 and 182L; 185 Recommended. Must be taken in conjunction with 180. Formerly laboratory portion of Paleontology 115. Laboratory demonstrating and studying marine protista of the fossil record, including planktonic benthic and larger foraminifera, radiolarians, diatomellae, and coccolithophores. Taxonomy, evolution, stratigraphy, biogeochemistry, paleoecology, preservation, and research applications will be the focus. (SP) Lips

186. Marine Geobiology. (2) Two 1-hour lectures per week. Prerequisites: Biology 1A, 1B, 182L or 182 recommended; Paleontology 115, Formerly Biology 160. Interrelationships between marine organisms and physical, chemical and geological processes in oceans. (F) Berry
200. Seminar for Integrative Biology Majors. (1) One 1-hour meeting per week with student presentations. Must be taken on a passed/not passed basis. Prerequisites: Senior standing, Integrative Biology majors. Formerly Botany 190. Student discussions of pertinent topics.

H186A-H196B. Thesis Course. (3-3) May be repeated for credit. Individually arranged. Prerequisites: Open only to seniors. Formerly Zoology 196A, Botany 195. Individual study and research for at least one academic year on a special problem to be chosen in consultation with a member of the staff; preparation of the thesis on a broader aspect. (F,SP) Staff

197. Supervised Field Studies By Upper Division Students. (1-4) Course may be repeated for credit. Meetings with instructor. Must be taken on a passed/not passed basis. Formerly Zoology 197, Zoology 197, Supervised experience in off-campus field work. Regular meetings with instructor and written report. (F,SP) Staff

198. Supervised Group Study and Research By Upper Division Students. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Formerly Zoology 198, Anthropology 198, Botany 198, Zoology 198, Botany 199, Zoology 199, Undergraduate research by small groups. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Independent. Must be taken on a passed/not passed basis. Prerequisites: Course in chosen subject. Formerly Zoology 199, Botany 199, Physiology 199, Anatomy 199, Genetics 199. Enrollment restrictions apply; see department. (F,SP) Staff

Graduate Courses

201. Scientific Photography—Theory and Methodology. (1) One 1-hour lecture per week. Prerequisites: Graduate standing or consent of instructor. Must be taken concurrently with 201L. Formerly Botany 210. An introduction to theoretical and practical aspects of scientific photography, including darkroom work, flash technique, close-up photography, copy work and photomicrography.

201L. Laboratory in Scientific Photography. (1) One 2-hour laboratory per week. Prerequisites: Consent of instructor. Must be taken concurrently with 201. Formerly Zoology 210L. Hands-on experience in scientific photography, with an emphasis on hands-on experience in scientific photography, with an emphasis on darkroom work, flash technique, close-up photography, copy work and photomicrography.

202. Quantitative Systematics. (2) Two 1-hour lectures per week. Prerequisites: One course in systematic or evolutionary biology. Formerly Botany 223. An examination of the theoretical background and application of quantitative methods in systematics, including measures of similarity and difference, cluster analysis, ordination techniques, cladistic methods, and information retrieval. (F) Duncan

202L. Laboratory in Quantitative Systematics. (2) One 2-hour discussion and one 4-hour laboratory per week. Prerequisites: One course in systematic or evolutionary biology. Formerly lab of 202. A discussion of recent papers and a laboratory devoted to the application of quantitative systematic methods. Each student will undertake a project using methods discussed.

204. Introduction to Research in Integrative Biology. (1-12) Course may be repeated for credit. Individually arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Limited to students working in this department. Formerly Zoology 220. Concentrates on experimental work under the direction of individual staff members; an introduction to experimental methods and research approaches in particular areas in Integrative Biology. (F,SP) Staff

205. Research Design. (2) One 2-hour discussion per week. The course is intended to convey information and ideas that are necessary to become a practicing scientist but which are not conveyed in most academic courses. The course will cover differences between inductive and deductive approaches to science; formulation of effective hypotheses; ethics of science, including honesty, confidentiality and social responsibility; consensus building and approaches to review paper criticism; structure of the review process in granting agencies and journals.

210. Pteridology. (2) Two 1-hour lectures per week. Prerequisites: 110, 110L, Plant Biology 130, or consent of instructor. Formerly Botany 222. An advanced introduction to fern systematic and functional biology. Formerly Botany 222. The use of living and prepared materials and techniques relative to the study of fern biology/field trips.

211. Seminar in Plant Morphology and Anatomy. (1) May be repeated for credit. One 1-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Botany 212. Advanced study in developmental, morphological and functional aspects of plant morphology and anatomy. Topics will be announced each semester.

210L. Pteridology Laboratory. (1) One 3-hour laboratory per week. Prerequisites: Concurrent or previous enrollment in 210 or consent of instructor. Formerly Botany 222. The use of living and prepared materials and techniques relative to the study of fern biology/field trips.

213. Seminar in Morphology. (1) May be repeated for credit. One 2-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Zoology 263. Discussion of mammalian biology in an interdisciplinary format. (F,SP) Liddicker, Patton

213L. Comparative Morphology Laboratory. (2) Course may be repeated for credit. Two 1-hour laboratory per week. Prerequisites: Consent of instructor. Formerly Botany 263. Hands-on experience with skeletal material. (SP,SP) Liddicker, Patton

216. Biology of Mollusks. (2) Two 1-hour lectures per week. Prerequisites: Consent of instructor. Must be taken concurrently with 216L. Formerly Zoology 224. Systematics, ecology, functional morphology, evolution biogeography of major mollusk groups.

216L. Laboratory in Biology of Mollusks. (1) One 3-hour laboratory per week. Prerequisites: Consent of instructor. Must be taken concurrently with 216. Formerly IB 224. Field trips and laboratory work related to diversity of living and fossil mollusks and instruction in field and laboratory techniques. Students will complete individual research projects during the second half of the course.

217. Invertebrate Review. (1) Course may be repeated for credit. One 1-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 103 (or equivalent); senior or graduate standing; consent of instructor. Formerly Zoology 251. Reports and discussion of original research in invertebrate zoology. (F,SP) Full, Hickman, Koehl, Simms, Sousa

217L. Invertebrate Zoology Laboratory. (1) One 2-hour laboratory per week. Prerequisites: Consent of instructor. Must be taken concurrently with 217. Formerly IB 224. Systematics, ecology, functional morphology, evolution biogeography of major mollusk groups.

218. Seminar in Invertebrate Zoology. (2) One 1-hour seminar every other week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 103 or equivalent; seniors or graduate standing; consent of instructor. Formerly Zoology 251. Reports and discussion of current literature in invertebrate zoology. (F,SP) Full, Hickman, Koehl, Simms, Sousa

219. Seminar in Invertebrate Zoology. (1) One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Zoology 251. Reports and discussion of current literature in invertebrate zoology. (SP,SP) Full, Hickman, Koehl, Simms, Sousa

232. Seminar in Neuroendocrinology and Reproduction. (1) Course may be repeated for credit. One 1-hour seminar per week. Prerequisites: Consent of instructor. Formerly Zoology 251. Reviews and reports of current research in vertebrate endocrinology and cytochemistry.

232L. Laboratory in Neuroendocrinology and Reproduction. (2) Course may be repeated for credit. Two 1-hour laboratory per week. Prerequisites: Consent of instructor. Formerly Zoology 251. Reviews and reports of current research in vertebrate endocrinology and cytochemistry.

245. Functional Neuroanatomy. (1) Two 1-hour lectures 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) Two 3-hour laboratories 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

246. Seminar in Advanced Neuroanatomy. (1) Course may be repeated for credit. Two 1-hour lectures per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 245 and consent of instructor. Formerly Anatomy 206. Current research in functional neuroanatomy.

247. Seminar on Controversies in Comparative Physiology. (2) Course may be repeated for credit. One 2-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Zoology 247. Reports and discussion of current literature. (SP) Full

248. Comparative Physiology and Endocrinology Seminar. (1) Course may be repeated for credit. One 1-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Zoology 247. Reviews and reports of current research in vertebrate endocrinology and physiology. (F,SP) Licht, Nicoll

249. Seminar on Evolutionary Genetics. (1) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Zoology 248. Recent developments in evolutionary genetics discussed in a seminar format. (F,SP) Thompson, Saltman

*Not offered 1991-92
*On leave, spring
*On leave, fall

*Recipient of Distinguished Teaching Award
250. Seminar in Animal Ecology. (Course may be repeated for credit. One 1-hour seminar per week. Prerequisites: 153A-153B or consent of instructor. Formerly Zoology 244. Topics to vary. (SP) Liddicker

251. Evolutionary Ecology. (2) Two 1-hour lectures per week. Prerequisites: 16B, 16B1, or 102, 102L; a course in ecological principles. Must be taken concurrently with 251L. A study of processes involved in the development and maintenance of ecological adaptations in individual plants, populations, and communities.

251L. Laboratory in Evolutionary Ecology. (2) One 4-hour laboratory per week plus 3 whole day field trips. Prerequisites: 153A-153B or consent of instructor. Formerly Zoology 249. Laboratory study of evolutionary ecology.

252. Physiological Ecology. (3) Two 1-hour lectures and one 2-hour discussion per week. Prerequisites: Plant Biology 100B, 145, 154, and 154L. Formerly Botany 256. Physiological aspects of adaptation in higher plants with emphasis on water relations and photosynthetic carbon metabolism.

253. Genetic Ecology. (2) Two 1-hour lectures per week. Prerequisites: An upper division course in genetics and one in ecology; 153A-153B or equivalent. Formerly Zoology 248. Lectures and discussions concerning the relationship between the genetic composition of populations and ecological process. Specific topics will vary from year to year.

254. Ecological Research Reviews. (1) Course may be repeated for credit. One 1-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and consent of instructor. Formerly Zoology 245. Reports and discussions of original research. (F,SP) Staff

255. Seminar in Marine Biology. (Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: Consent of instructor. Formerly Zoology 229. Topics to vary. (F) Sousa

256. Seminar in Physiological Ecology. (Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: 145 or consent of instructor. Formerly Zoology 237. Topics to vary. Report and discussion of current literature. (SP) Caldwell, Barlow

257. Seminar in Animal Behavior. (Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: 153A-153B or consent of instructor. Formerly Zoology 241. Specific topics will vary. (SP) Power

259. Advanced Paleontology. (Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Formerly Paleontology 243. Topics will vary from year to year but will include paleoecology of major groups of organisms or major environmental changes from population community evolution, or taxonomic perspectives. (F,SP) Berry

260. Advanced Botanical Systematics. (2) Two 1-hour lectures per week. Prerequisites: 16B, 16B1, or equivalent and consent of instructor. Formerly Botany 224. Principles, articles, recommended international or national Botanical Nomenclature; analysis of Codes through application to examples, nomenclatural resources; comparison with Zoological Code.

262. Topics in Systematic Botany. (1) May be repeated for credit. One 1-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Botany 225. Advanced study in various topics in plant systematics. Topics will be announced in advance of each semester. (F,SP) Duncan, Ornuff

263. Topics in Ecology and Evolutionary Biology. (1) May be repeated for credit. One 1-hour discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Botany 253. Lectures on current literature in ecology and evolutionary biology. Topics vary from semester to semester.

264. Seminar in Evolutionary Biology of the Vegetation. (1) Course may be repeated for credit. One 1-hour 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) Greene, Johnson, Liddicker, Patton, D. Wash

265. Seminar on Speciation in Vertebrates. (2) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: 145, 145L, or equivalent. Formerly Zoology 265. Review of theories of speciation and isolating mechanisms in vertebrates, with emphasis on comparative literature.

267. Evolution and Systematics of Mammals. (2) Two hours of lecture, one weekend field trip. Prerequisites: 183, 183L, 184, 184L, and 160 or equivalent. Must be taken concurrently with 267L. Formerly Paleontology 263. Study of the World of Mammals; comparative research on modern animals contributing to determination of mammalian phylogenetic relationships. A field trip will provide experience with collecting techniques.

267L. Laboratory in Evolution and Systematics of Mammals. (2) Three 3-hour laboratories and one 1-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Paleontology 264. Study of fossil record of Mammalia.

268. Seminar in Topics of Evolution Above the Species Level. (2) Course may be repeated for credit. Two hours of seminar per week. Formerly Paleontology 246. Current issues in macroevolution and paleobiology, using both neontological and paleontological data. Intensive study of a small number of broad questions in evolution per semester, to be determined by interest of participants and current developments in the field. (F) Padian

270. Population Genetics. (2) Two hours lecture per week. Prerequisites: General genetics and probability, familiarity with one- and two-locus mathematical models. (SP) Thompson

272. Ecosystems of California. (3) One 4-hour seminar per week. Must be taken on a passed/not passed basis. Prerequisites: Graduate standing; consent of instructor. This graduate seminar will visit and discuss the major ecosystems of California. Each week we will visit a different ecosystem. At the site students will present background on climate, soils, fauna, flora, and anthropological influences on that ecosystem. We will then discuss the unique aspects of that ecosystem and decide how to make it particularly suitable for certain types of study.

275. Human Genetics. (2) Two hours lecture per week. Prerequisites: General genetics and elementary probability or consent of instructor. Formerly Genetics 225. Advanced topics in human genetics. Discussion of modern molecular techniques and theoretical approaches for studying human diseases. Emphasis on discussing the many diseases associated with the human histocompatibility (HLA) system. (F) Thompson

280. Seminar in Paleontological Research. (1) One 1-hour 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

282. Paleontology and Evolution of Amphibians, Reptiles and Birds. (4) Two 2-hour lecture per week. Prerequisites: 183, 183L, 184, 184L, and 160 equivalent. Formerly Paleontology 225. Evolution, systematics, functional morphology, and paleontology of the non-mammalian land vertebrates, with emphasis on the Mesozoic Era. Must be taken concurrently with 282L.

282L. Seminar in Paleontology of Amphibians, Reptiles and Birds. (2) Two 1-hour laboratories per week. Prerequisites: 183, 183L, 184, 184L, or equivalent. Formerly Paleontology 227. Succession of world's mammalian faunas, their geography, stratigraphy, and ecology as related to geologic history and to contemporaneous paleobiotas.

283L. Laboratory for Mammalian Paleofaunas of the World. (2) Two hours of lecture and one 1-hour discussion per week. Prerequisites: 267 AND 267L. Must be taken concurrently with 283L. Formerly Paleontology 227. Laboratory study of record of mammalian paleofaunas.

284. Advanced Stratigraphic Paleontology. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 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 biology, and stratigraphic 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. (F) Lips

286. Seminars in Paleontology. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Paleontology 250. Advanced study and current literature in various fields of paleontology. Topics vary from year to year. (F,SP) Staff

287. Systematics Research Reviews. (1) Course may be repeated for credit. One 1-hour lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Discussion of current research in plant systematics.

288. Plant Evolutionary Ecology Research Reviews. (1) Course may be repeated for credit. One 1-hour lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Discussion of current research in plant evolutionary ecology.

289. Tropical Biology—An Ecological Approach. (8) 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, the dynamics of tropical biotas, their relationships to tropical environments; an intensive field course in Costa Rica. Offered in cooperation with the Organization for Tropical Studies. This course is sponsored by the Graduate Council. (SP) Staff

290. Research Seminar. (1) Course may be repeated for credit. One 1-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites for credit: Paleontology 256 and Zoology 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. One 1-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Zoology 240. Review and discussion of topics of current interest. Topics to vary. (F,SP) Staff
Interdepartmental Studies Courses

Upper Division Courses

*IDS 116. Pollen Analysis. (2) Three hours of laboratory per week, two full weekends, and three one-day trips for reports. Prerequisites: Must be taken in conjunction with IDS 116. The analysis of pollen types commonly encountered in the fossil record, with special reference to the Quaternary. The relationship between the "pollen rain" and modern vegetation. The taxonomy of pollen use of pollen analysis in archaeological and paleoecological contexts. Discussion of selected case studies. Sponsoring departments: Anthropology, Integrative Biology.

*IDS 161L. Pollen Laboratory Analysis. (3) Three hours of laboratory per week plus two weekend field trips in September & October. Prerequisites: Must be taken in conjunction with 116. An introduction to the techniques of Quaternary pollen analysis: recovery of sediment cores from lakes and peat bogs, extraction of fossil pollen from sediment cores, collection of surface samples, graphical presentation of results. Sponsoring departments: Geography and Integrative Biology.

*IDS 122. Animal Behavior. (3) Three hours of lecture, one group discussion, plus one hour discussion per week. Prerequisites: Biology 1A-1B or 11, or Entomology 100. Molecular and Cell Biology 102 strongly recommended. An introduction to comparative animal behavior and behavioral physiology from evolutionary perspective, including analysis of behavior, genetics and development, learning aggression, reproduction, adaptiveness, physiological substrates. Sponsoring departments: Integrative Biology, Psychology and Entomological Sciences.

*IDS 123. Animal Behavior Laboratory. (3) Course may be repeated for credit. One 1-hour lecture, one 3-hour laboratory per week. Prerequisites: Biology 1A-1B or 11, or Entomology 100 or Anthropology 106, and consent of instructor. A laboratory introduction to the observational study of comparative animal behavior in a semi-naturalistic setting. Students will learn sampling and observational methods, recording, data analysis and written presentation of observational data. Lecture and discussion will focus on comparative animal behavior. Animals will be those in the vertebrate colonies at the Field Station for Behavior Research. Sponsoring departments: Anthropology, Integrative Biology, and Psychology.

Graduate Courses

IDS 204. Animal Behavior Research Reviews. (1) Course may be repeated for credit. One 1-hour seminar per week. Prerequisites: Completion of a comprehensive examination in animal behavior or consent of instructor. Reports and discussions of original research or views, completed or in progress. Not all participants need report, but all are expected to attend and enter into the discussions. Sponsoring departments: Integrative Biology and Psychology. (F,SP)

*IDS 215. Faunal Analysis in Archaeology. (4) One hour lecture, one hour discussion, and two 3-hour laboratories per week. Prerequisites: Integrative Biology 104 and 104L, and consent of instructor. An introduction to the systematic analysis of faunal remains. Topics include methods and preparation of a faunal analysis of an archaeological site. Sponsoring departments: Anthropology and Integrative Biology.

*IDS 228. Human Evolution, Prehistory and Paleoenvironment. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. A seminar devoted to consideration of current research in paleoanthropology and related subjects. Sponsoring departments: Anthropology and Integrative Biology.

*IDS 282. Tumor Biology Seminar. (1) Course may be repeated for credit. One 1-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor, Reports and reviews of current research in tumor biology. Sponsoring departments: Integrative Biology and Molecular and Cell Biology.

Professional Course

*IDS 407. Introduction to Scientific Diving. (2) Two 1-hour lectures, one 3 1/2-hour pool lab plus one 7-hour ocean laboratory per week. Prerequisites: Swimming and first aid, and medical exam, CPR and basic first aid as prescribed by the Diving Control Board and consent of the instructor. Diving physics, physiology, medicine, rescue, first aid, recompression, air and decompression, currents, physical fitness, psychology, environment, suba marine life, research methods, life support equipment and University regulations. Leading to University certification to use underwater life support apparatus for study or research. Sponsoring departments: Integrative Biology and Plant Biology.

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 classes. There is no central information point for these courses; further information, please consult the departments sponsoring the classes. This information appears at the end of each course description.

Lower Division Courses


2. Introduction to Cognitive Science. (3) One 2-hour lecture and one 3-hour laboratory per week. This course is an introduction to the interdisciplinary field of cognitive science. Lectures and readings will survey research from artificial intelligence, psychology, linguistics, ethnology, neuroscience, and will cover topics such as the nature of knowledge, thinking, remembering, vision, imagery, language, and consciousness. Sections will demonstrate some of the major methodological approaches in Cognitive Science including education in Mathematics, Science, and Technology 1. (SP) Proctor, Ranney

*14. Contemporary Global Issues for Women. (4) Three hours of lecture per week. A lower division course designed to introduce undergraduate women students to the history, philosophy, and work of women's rights and to the advocacy groups that have lobbied to enlarge women's human rights. The course will focus on helping students understand the historical context in which a woman's movement emerged and the forces and elsewhere, and the role of governments, laws, social forces and political actors in helping a movement emerge. Also listed as Sociology 91 and Women's Studies 14.

80. Environmental Physics. (3) Three hours of lectures per week. The lower division course is designed to introduce undergraduate women students to the history, philosophy, and work of women's rights and to the advocacy groups that have lobbied to enlarge women's human rights. The course will focus on helping students understand the historical context in which a woman's movement emerged and the forces and elsewhere, and the role of governments, laws, social forces and political actors in helping a movement emerge. Also listed as Sociology 91 and Women's Studies 14.

On leave, spring.

Recipient of Distinguished Teaching Award

On leave, spring.
Upper Division Courses

*110. History of American Technology. (4) Four hours lecture per week. Survey of American technology from the present back to its technical development. Topics include industrial revolution, technology of war, medicine, science in technology, industrialization, and corporations. Sponsoring departments: History and Electrical Engineering and Computer Science.

*103. Introduction to Mathematical Economics. (3) Three hours of lecture per week. Prerequisites: Math 50A-50B. Formerly Economics 104. Selected topics illustrating applications of mathematics to economic theory. This course is intended for upper-division students in economics, mathematics, statistics, the physical sciences, and engineering, and for economics majors with adequate mathematical preparation. No economic background is required. Also listed as Economics 103 and Math 103.

105. Modern Applications of Plant Biotechnology. (3) Two 1-hour lectures and one 1-hour discussion/conference per week. Prerequisite: Molecular and Cell Biology 122 or equivalent. 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. In addition, emphasis will be placed on understanding the tools and strategies involved in optimizing plant productivity. Also listed as Plant Pathology 105 and Plant Biology 105. (F)

*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 per week. Prerequisites: Upper division standing. Students must also be enrolled in IDS 110L with the same grading option. This course is designed to provide students with an introduction to the principles and applications of modern computer technology. Basic concepts of modern computer technology will be reviewed in light of emerging biotechnology. In addition, emphasis will be placed on understanding the tools and strategies involved in optimizing plant productivity. Also listed as Plant Pathology 105 and Plant Biology 105. (F)

*115. Pollen Analysis. (2) Three hours of laboratory per week, two full lecture days and three one-half days for reports. Prerequisites: Must be taken in conjunction with 116L. The theory of pollen analysis. Taxonomy of pollen types commonly encountered in the fossil record, with special reference to the Quaternary. The relationship between the "pollen rain" and modern vegetation. The taxonomy of pollen. Use of pollen analysis in archaeological and paleoecological contexts. Discussion of selected case studies. Sponsoring departments: Geography and Integrative Biology.

*116L Pollen Analysis Laboratory. (3) Three hours of laboratory per week plus four full field trips in September & October. Prerequisites: Must be taken in conjunction with 116. An introduction to the techniques of Quaternary pollen analysis: recovery of sediment cores from lakes and peat bogs, examination of fossil pollen from sediment cores, collection of surface samples, graphical presentation of results. Sponsoring departments: Geography and Integrative Biology.

118. Enlightenment and the Visual Arts in 18th Century France. (4) Three hours of lecture per week. Prerequisites: Students must have a reading knowledge of French and appropriate background in the history of Western art. This course will deal with the interrelation of the visual arts and ideas. Starting with those elements which were carried over from classicism into the 18th century, the course will focus on the topic of a change in style, ideas and attitudes, fostered by selected points of interest. Sponsoring departments: History of Art and French. (F) de Caso, Guy

*119. Multidisciplinary Studies and Field Experience in Aging. (2) Sponsoring departments: Optometry, Social Welfare, and Molecular and Cell Biology. One 2-hour seminar per week for seven weeks and 6 hours of field work. Prerequisites: Upper division or graduate student and consent of instructor. Study of adults 70 years and over. Students will visit older patients from local geriatric clinic and confer with clinic staff. One hour weekly seminar consists of lecture by faculty on aging from specific discipline. Other hour is devoted to case presentation by student on a patient in geriatric clinic. Course grade based on student participation and final paper demonstrating understanding of interdisciplinary nature of aging and caring for older people.

121A-121B. Environmental Education. (3,3) Five and one-half hours of lecture/discussion and six hours of field work per week, plus one class day during the semester. Prerequisites: 121A is prerequisite to 121B: consent of instructor. Theory and practice of translating ecological knowledge, environmental issues and values to all facets of society, including schools. Concentrated experience in participatory education. Sponsoring departments: Education and Conservation and Resource Studies. (F) Hurst

*122. Animal Behavior. (3) Three hours of lecture, one hour demonstration, plus one hour discussion per week. Prerequisites: Biology 1A-1B or 11, or Entomology 100. Molecular and Cell Biology 102 strongly recommended. An introduction to comparative animal behavior. This course is designed to provide students with an opportunity to work closely with faculty. Investigating a topic of mutual interest in great depth. Emphasis in on student discussion and collaboration. Original research and examination of solutions to problems. Also listed as Middle Eastern Studies 111 and Woghen's Studies 111. (F,SP) Staff

*114A-114B. Advances in Aging: Alzheimer's Disease; Biological and Social Dimensions. (2,2) Two 1-hour lecture per week in the evening. Prerequisites: High school biology and chemistry. This interdisciplinary course will single out specific topics in aging of great current interest (fall, Alzheimer's disease; spring, strategies for intervention) and present lectures on all aspects of each topic (biomedical, health, socio-economic, legal, ethical). Invited speakers with special expertise in these areas will participate. Sponsoring departments: Optometry, Social Welfare, Public Health, and Molecular and Cell Biology.

123. Animal Behavior Laboratory. (3) Course may be repeated for credit. One 1-hour laboratory, one 1-hour discussion per week. Prerequisites: Biology 1A or 11; or Integrative Biology 31; or Anthropology 106; and consent of instructor. A laboratory course based on student participation and final paper demonstrating understanding of interdisciplinary nature of aging and caring for older people.

125. Modern Applications of Plant Biotechnology. (3) Two 1-hour lectures and one 1-hour discussion/conference per week. Prerequisites: Upper division standing or consent of instructor. Examines patterns of women's immigration to the U.S. in specific socio-historical and cultural contexts. Emphasis on feminist, ethnic and identity issues from women-centered analysis and methodology. Also listed as Ethnic Studies 136, and Women's Studies 136. (SP)

140. Technical Communication for Non-Native Speakers of English. (3) Three 1-hour lectures per week. Prerequisites: English 108 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 advanced work in Engineering 190. Sponsoring departments: Subject A and the College of Engineering. (F,SP)

145. Chemical Methods in Nuclear Technology. (3) One 1-hour lecture and one 1-hour laboratory per week. Prerequisites: Nuclear Engineering 101 or Chemistry 143. Experimental illustrations of the interrelation between chemical and nuclear science and technology: fission process, chemistry of fission fragments, chemical effects of nuclear transformations; application of radioactivity to study of chemical problems; neutron activation analysis. Also listed as Chemistry 144 and Nuclear Engineering 106.

153A. Images of Black Women in Literature: Slavery to the 20th Century. (3) Three hours lecture and one hour discussion per week. Prerequisites: Nuclear Engineering 101 or Chemistry 143. Historical and cultural contents. Special attention to race, gender, and identity issues from women-centered analysis and methodology. Also listed as Afro-American Studies 153A and Women's Studies 153A. (F) Christian

153B. Contemporary Images of Black Women in Literature. (3) Three hours lecture and one hour discussion per week. Prerequisites: Upper division standing or consent of instructor. Analysis of the cultural and social assumptions that contribute to the various images of the black woman in Western literature and Black American writing. Course explores the literature of 19th century Afro-American women, an exporting field in American literary discourse. Also listed as Afro-American Studies 153A and Women's Studies 153A. (SP)

156. Education and American Society. (3) Two 1-hour lectures per week. Prerequisites: Upper division standing or consent of instructor. Examination of educational institution in America. Emphasis upon the shifting educational responsibilities of family, church, workplace, schools, colleges, and youth culture; the demographic, economic, political, and cultural forces explaining the rise of public school systems; a challenge to school hegemony. Also listed as Education 156 and Social Sciences 156. (F) Clifford

167. Introduction to Chinese Philosophy. (4) Two 1-hour lectures and one 1-hour discussion per week. A survey of the Chinese philosophy from late
Graduate Courses

202. Modeling Ecological and Meterological Phenomena. (3) Two 1/2-hour lectures per week. Prerequisites: Energy Resources 102 or consent of instructor. Modeling methods in ecology and meteorology; stability analysis; effects of anthropogenic stress on natural systems. (Also listed as Energy and Resources 202 and Soil Science 202.) (F)

204. Animal Behavior Research Reviews. (1) Course may be repeated for credit. One 1/2-hour seminar per week. Prerequisites: Graduate standing; basic course in animal behavior; consent of instructor. Reports and discussions of original research or views, completed or in progress. Not all participants need report, but all are expected to attend and enter into the discussions. Sponsoring departments: Integrative Biology and Psychology. (F,SP)

205. Wind and Wave Forces on Marine Structures. (3) Two 1/2-hour lectures per week. Prerequisites: Civil Engineering 206A. Determination of wind and wave forces on coastal structures, pipelines, fixed and mobile offshore platforms. Evaluation of nominal and extreme loadings, local and global forces, and static and dynamic load effects. Time and frequency domain characterizations of wind and wave loads. Evaluation of accuracy of analytical models based on field and laboratory data. Also listed as Civil Engineering 206B and Naval Architecture 205B. (SP)

206. Advanced Seminar in Public and Nonprofit Management. (3) Course may be repeated for credit. Three hours of seminar per week. This seminar is designed for students who wish to explore advanced topics in the field of public and nonprofit management. Major conceptual, theoretical and methodological issues are its primary focus.

207. Public Management: Managers and Management. (3) Three hours of lecture per week. The character, role and influence of the manager in public and nonprofit organizations. Analytical and interpersonal aspects. Authority, responsibility and control in policy making and administration. Performance and accountability measures. Coping with the external environment. Ethical dilemmas and current issues.

208. Public Management: Techniques of Managerial Analysis. (3) Two 1/2-hour lectures per week. Examination of methods, strategies, and requirements for effective public management in the public and nonprofit sectors. Particular emphasis on budgeting and financial management. Technical and interpersonal considerations in defining missions, influencing behavior of outside organizations, securing and controlling resources, managing staff and operations, managing the political environment, and building organizational capacity.

209. Public Management: Applied Microeconomics. (3) Three hours of lecture per week. A fast-paced introduction to microeconomics for managers in the public and nonprofit sectors of the economy. Concepts of efficiency applied to cost-effectiveness and discrimination have been intended to serve as a prerequisite for later courses in applied economics.

210. Public Management: Organizational Understanding for Managers. (3) Two 1/2-hour seminar sessions per week. The applications of concepts from organizational behavior and behavior to enhancing understanding of public and nonprofit organizations. The role of manager in complex settings, authority relations and conflict resolution, professional and conflict, technical and non-technical, organizational structure, problems of implementation, interorganizational relations and political environments. Case studies will be examined.

211. Public Management: Public Sector Accounting. (3) Three hours of lecture per week. Accounting principles and practices for managers of public and nonprofit organizations. Emphasis is on development of efficient systems which will provide both internal data for managers for analysis of past performance, operating plans, and future plans, and data for accountability to external parties.

212. Public Management: Financial Management. (3) Three hours of lecture per week. Theory and practice of financial operations for managers of public and nonprofit organizations. Sources of financing, expenditure evaluation and control, policy issues and special topics.
Zoonotic disease agents transmitted by fleas and other insects will be covered.

226. Human Evolution, Prehistory and Paleoenvironments. (2) Course may be repeated for credit. One 2-hour lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. A seminar course devoted to consideration of current research in paleoanthropology and related subjects. Sponsoring departments: Anthropology and Integrative Biology.

229. Protein/Nucleic Acid Chemistry and Enzymology. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Protein structure, denaturation and folding. Nucleic acid chemistry. A laboratory course required. Intended for graduate students in Chemistry, Biochemistry and Molecular and Cell Biology. Sponsoring departments: Chemistry and Molecular and Cell Biology. (SP)

232A-232B. Understanding Families: Methods in Family Research. (1-1) Two hour seminar every other week. Prerequisites: Consent of instructor. This seminar will focus on the relation between theory and method in understanding families. It will examine historical, cultural, and psychological perspectives on studying couples, parent-child relationships, and family systems as they change over time. Attendees will engage in this family and the connections between the family and other social institutions. Methods for understanding the role of the family in both normal and dysfunctional development will be evaluated.

235. Community Scale Energy Systems. (3) Two 1-1/2 hour lectures per week. Must be beyond 100 level. Prerequisites: Consent of instructor. Energy supply at the community related fields. Term project. Sponsoring departments: Anthropology and Integrative Biology.

236. Cognitive Science Research Discussion. (1) Course may be repeated for credit. One 1-1/2 hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Student must be the Cognitive Science R.A. for one of the professors as associated with the Cognitive Science Program. The students will interchange on the Cognitive Science-related research that they are carrying on as R.A.'s with the aim of broadening their experience and the scope of the research. The group, in addition, will discuss relevant selected readings. This course is required of all Cognitive Science R.A.'s. Sponsoring departments: Linguistics, Psychology, and Philosophy.

237A-237B. Cognitive Science Seminar. (1-1) One 1-1/2 hour lecture and one 1-1/2 hour discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Weekly presentations by local and visiting researchers on a range of topics in Cognitive Science, with ongoing discussion. Sponsoring departments: Psychological and Computer Sciences, Linguistics, Psychology and Philosophy.

241. The Urban Environment. (3) Two 1-hour seminars and one 3-hour laboratory per week. The components, structure, and meaning of the urban environment. Environmental problems, attitudes, and criteria. Environmental survey, analysis, and interview techniques. Methods of addressing environmental quality. Environmental Health Sciences. Sponsoring departments: City and Regional Planning and Landscape Architecture. (F) Bosselmann, Jacobs (F)

242. Urban Design in Planning. (3) Three hours of seminar and discussion per week. Prerequisites: Consent of instructor. This seminar will focus on urban design in the planning process. It will include field surveys, methods of community involvement, problem identification, goal formulation and alternatives generation, environmental media and presentation, design guidelines and review, environmental evaluation and impact assessment. Case studies. Sponsoring departments: City and Regional Planning and Landscape Architecture. (SP) Jacobs

252. Stellar Structure and Evolution. (3) Three hours of lecture per week. Prerequisites: Physics 137A-137B, 112, 110A-110B. Equations of stellar structure, radiative transfer and convection, thermonuclear reactions; stellar evolution; generation; stellar models, degenerate configurations, evolution; atomic sequences; supernovae; neutron stars; black holes; nucleosynthesis. Sponsoring departments: Physics and Astronomy.

254. High Energy Astrophysics. (3) Three hours of lectures per week. Prerequisites: Physics 201 or consent of instructor. Basic physics of high energy radiation processes in an astrophysical environment. Cosmic ray production and propagation. Applications selected from pulsars, gamma-ray burst, interstellar medium, intergalactic medium, extragalactic sources, quasars, and big-bang cosmologies. Sponsoring departments: Physics and Astronomy.

255A-255B. Eastern Frontiers of the Classical World. (4-4) Course may be repeated for credit. One 3-hour seminar per week. The course is intended to provide an archaeological perspective on the eastern frontiers of the classical world: frontiers which came to extend to Afghanistan and beyond. 255A will deal with prehistoric frontiers in this eastern area which eventually became a part of the classical world. 255B will explore the interactions of the classical world with the indigenous cultures of Central Asia. Sponsoring departments: Near Eastern Studies and South and Southeast Asian Studies.

270. Doctoral Seminar 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. The seminar features current research of faculty, from UCB 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 main- tained. Markets, hierarchies, hybrids, bureaus, and the supporting institutions of law and politics all come under scrutiny. Sponsoring departments: Economics and Business Administration. (F-SP) Williamson

271. Seminar in Neuropsychology. (3) Course may be repeated for credit. One 3-hour lecture and one 2-hour laboratory per week. Lectures and case presentations in neuropsychology. Discussion of problems of cognitive and information processing manifested in cases of amnesia, dementia, traumatic injury, and other forms of neurological damage. Case presentations of patients alternate with discussions of research strategies for evaluation of cognitive functioning. Presentation of neuropsychological population as opportunities for the study of cognitive functioning. Sponsoring departments: Education and Psychology.

282. Tumor Biology Seminar. (1) Course may be repeated for credit. One hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor and reports of current research in tumor biology. Sponsoring departments: Integrative Biology and Molecular and Cell Biology.

285. Theoretical Astrophysics Seminar. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. The study of theoretical astrophysics. Sponsoring departments: Astronomy and Physics.

290. International Food and Nutrition Policies. (3) Sponsoring departments: Nutritional Sciences, Agricultural and Resource Economics, Social and Administrative Health Sciences. Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. Interdisciplinary course surveying the world between food production, food consumption and nutrition: the effect of income and prices on food demand, and socioeconomic factors affecting food consumption within and among households. The various nutritional problems plaguing developing countries (including famine); intervention measures, such as food aid, feeding programs, and health programs and management of food aid. Emphasis and methods of program evaluation are reviewed. (SP)

291A. Oral Performance: Noetica and Poetics. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor required. This seminar will explore how oral performances of classical literature and traditions and methods of program evaluation are reviewed. (SP)

292. Design, Construction, and Maintenance of Marine Structures. (3) Two 1-1/2 hours per week. Equipment, procedures, and considerations associated with the construction, maintenance, and decommissioning of coastal and offshore structures including breakwaters, piers, fixed and mobile platforms. Corrosion prevention. Underwater inspections and repairs. Design, constraints, and criteria for steel and concrete, structures, pile and mat foundations. Also offered as Civil Engineering 290E and Naval Architecture 290C. (F)

293. Design Criteria for Marine Structures. (3) Two 1-1/2 hours per week. Development of criteria for design and re-qualification of marine structures (platforms, floating facilities). Research strategies for evaluation of performance and life of structures. Emphasis and methods of program evaluation are reviewed. (SP)

294. Management of Technology Joint Learning Seminar. (3) One hour lecture and three hours unscheduled laboratory per week. Prerequisites: Business Administration 296 or 297, or consent of instructor. Students, selected by the instructor, must be beyond 100 level. Prerequisites: Consent of two faculty advisors (Bps. Adm. & 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 the technology management process. Comprehensive report and presentation required. Sponsoring departments: Engineering and Business Administration.

295. Systems and Integrative Biology. (1) Course may be repeated for credit. One 2-hour seminar/lecture every other week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Biophysics, Bioengineering, Nutritional Sciences or Physiology. Presentation and discussion of current research in integrative, developmental, and regulatory biology. Emphasis on interdisciplinary communication and approaches. Sponsoring departments: Nutritional Sciences and Molecular and Cell Biology. (SP)

296. Management of Innovation and Policy. (3) Two 1-1/2 hours per week. Prerequisites: Gradu- ate 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 marketed. Sponsoring departments: Engineering and Business Administration.

Professional Courses:

407. Introduction to Scientific Diving. (4) Two 1-1/2 hour lectures, one 3-1/2 hour lab pool plus one 7-1/2 ocean dives. Prerequisites: Certification in SCUBA Diving, test, free diving test, and medical exam, CPR and basic first aid as prescribed by the Diving Control Board and consent of the instructor. Diving physics, physiology, diving and equipment. Factors affecting and causing illness, injuries, disorientations, waves, currents, navigation, physical fitness, psychology, environment, subtidal marine life, research methods, life support equipment and University regu-
Italian

(College of Letters and Science)

Department Office: 5125 Dwinelle Hall, 642-2704
Chair: Gustavo Costa, Dottore in Filosofia

Graduate Program

Master of Arts in Italian. Requirements: A minimum of 27 units is needed. Upper division and graduate courses of which at least 12 units must be at the graduate level and must include Italian 200; a comprehensive written examination based on a departmental reading list. Students desiring to continue for the Ph.D. in Italian will take an oral permission-to-proceed examination. Further information is available from the Italian Department.

Doctor of Philosophy in Italian. The Ph.D. program is open to students with an M.A. degree in Italian or in a program in which Italian was the major field of study. Requirements: Demonstration of a reading knowledge of Latin and a modern language other than Italian and English; a basic knowledge of Italian philology; a written and oral qualifying examination in a major field of Italian literature and in a minor of an approved related field; a dissertation. Detailed information is available from the Italian Department.

Ph.D. in Romance Languages and Literatures (emphasised in Italian). This program requires for admission an A.B. degree with a major in Italian approximately equivalent to the undergraduate major at Berkeley. 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, Spanish, and French in a written examination or appropriate course work in the others. A reading knowledge of German is recommended. The precise nature of the qualifying examination will depend on the student's choice of two alternative plans of preparation, both of which require a detailed knowledge of Italian literature and familiarity with Romance philology, with emphasis on Italian. Plan I further develops a reading knowledge of Latin, Spanish, and French in a written examination or appropriate course work in the others. A reading knowledge of German is recommended. The precise nature of the qualifying examination will depend on the student's choice of two alternative plans of preparation, both of which require a detailed knowledge of Italian literature and familiarity with Romance philology, with emphasis on Italian. Plan II further requires a command of one or two, integrated fields (period, movement, or genre) in both Spanish and French literatures.

Lower Division Courses

1. Elementary Italian. (5) Five 1-hour classes and one hour laboratory per week. Basic grammar for beginners. (F,SP)

2. Intermediate Italian. (5) Five 1-hour classes and one laboratory session per week. Prerequisites: 1 or 14A. Basic grammar for beginners. (F,SP)

3. Advanced Italian. (5) Five 1-hour classes per week. Prerequisites: 2 or 14B. Grammar review, reading, and written composition. (F,SP)

4. Advanced Italian. (5) Five 1-hour classes per week. Prerequisites: 3 or 14C. Selected readings in modern Italian prose; a review of the essentials of grammar; written and oral compositions. (F,SP)

14A. Individualized Language Instruction. (1-5) In any given semester students may receive credit for additional units completed beyond those for which they originally filed. One group meeting per week plus individual conferences as needed. Split grading is optional. A self-paced course corresponding to 1. Students may not enroll for less than two units - except when one unit is needed to complete the last unit of the course. (F,SP)

14B. Individualized Language Instruction. (1-5) In any given semester students may receive credit for additional units completed beyond those for which they originally filed. One group meeting per week plus individual conferences as needed. Split grading is optional. Prerequisites: 1 or 14A. A self-paced course corresponding to 2. Students may not enroll for less than two units - except when one unit is needed to complete the last unit of the course. (F,SP)

101A-101B. Advanced Grammar Composition and Conversation. (3) Three 1-hour classes per week. Basic grammar and grammatical analysis of representative texts; advanced written and oral composition. (F,SP)

103A-103B. Introduction to Italian Literature. (3) Three 1-hour lectures per week. An introduction to the chief currents and authors of Italian literature. Lectures, selected readings and analysis of texts. (F,SP)

109A-109B. Dante's Divine Comedy. (3) Three 1-hour lectures and discussions per week. A close study of Dante's masterpiece. (F,SP)


111. Fifteenth Century Literature. (3) Three 1-hour lectures per week. Humanism and the Early Renaissance.

112A-112B. Sixteenth Century Literature. (3) Three 1-hour lectures per week. A. The High Renaissance. (F) B. The Late Renaissance. (F)

Assistant Professors:

Gioia Papalio Blasini, Ph.D. Johns Hopkins University. 20th-century literature, theory of criticism

Gustavo Costa, Dottore in Filosofia, University of Rome. 20th-century literature, history, and philosophy

Nicolas J. Perella, Ph.D. Harvard University. Italian literature, comparative literature, stylistics, thermatology

Ruggiero Stefanini, Dottore in Lettere, University of Florence. Medieval studies, Italian and Roman philology

Senior Lecturer:

Catherine Feucht, B.A. University of North Dakota. Language coordinator

Major Adviser: Mr. Botterill

Graduate Adviser: Mr. Stefani.ni.

The department gives undergraduates the opportunity to acquire proficiency in the Italian language and a broad background in Italian literature from its beginnings to the present. It also offers courses in English translation on Italian civilization, literature, and film. The graduate program offers in-depth training in the history and critical analysis of Italian literature along with courses in philology and stylistics.

The Major

Lower Division. Courses 1, 2, 3, 4, or their equivalent in linguistic proficiency.

Upper Division. 27 units of upper division courses (of which at least 15 units must be taken in residence) including Italian 101A-101B, 103A-103B. No more than one Italian film course in English may count toward the major unit requirement.

Honors Program. To enter the honors program, in addition to having a minimum overall grade-point average of 3.3, the student must have completed at least 18 upper division units in the major with a minimum grade-point average of 3.5. Candidates must enroll in Italian H195 for one semester during which they must register for one hour of research and write a honors thesis of at least 20 pages under the guidance of a faculty member.

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.

Lower Division. Required: Italian 1, 2, 3, 4, or their equivalent in linguistic proficiency. Recommended: Italian 40B.

113. Seventeenth Century Literature. (3) Three 1-hour lectures per week. The main trends in the prose and poetry of the age of the Baroque.


115. Nineteenth Century Literature. (3) Three 1-hour lectures per week. (F,SP)

115A. From Neoclassicism to Romanticism. (3) Monti, Foscolo, and early Leopardi. (SP) Perella


115C. "Decadentismo" and "Verismo". (3) Emphasis on Carducci, Pascoli, Verga, D'Annunzio.

117. Twentieth Century Literature. (3) Three 1-hour lectures per week. (F,SP)

117A. Fiction. (3)

117B. Poetry. (3) (SP) Biasin

117C. Theatre. (3) (F) Biasin


140. Petrarch and Boccaccio (In English). (3) Three 1-hour lectures per week. Lectures, readings, and discussions of Petrarch's Rime and Boccaccio's Decameron.

150. Humanism and the Renaissance (In English). (3) Three 1-hour lectures per week. The waning of the Middle Ages, Humanism, and the rise of the Renaissance. Analysis and discussion of the main trends of Humanistic thought.

155. Machiavelli (In English). (3) Three 1-hour lectures per week. The political and literary works of Machiavelli in the context of the thought and culture of his age.

160. Italian Culture During the Fascist Period (In English). (3) Three 1-hour lectures per week. An examination of the politico-cultural climate of the fascist regime.

165. The Anti-Hero in the Contemporary Italian Novel. (3) Three 1-hour lectures per week. An analysis of the novelistic portrait of the anti-hero figure that pervades contemporary culture.

170. The Italian Cinema: History, Genres, Authors (In English). (3) Course may be repeated for credit when topic changes. Three 1-hour lectures and 2-3 hours film viewing, analysis, and discussion per week. An analysis of Italian cinema as seen in the development of specific film genres such as neorealism, comedy, self-reflexive cinema. Occasionally the course will concentrate on a specific director and study his individuality through style, theme and personal development. This course fulfills major film requirement in one of history, genre, author. (SP) Moses

175. Film and Literature (In English). (3) Course may be repeated for credit when topic changes. Three 1-hour lectures, 2 hours film viewing, and 2-hour video production workshop per week. The interaction of film-style with literary and poetic structure studies through film theories, film novels, and the work of outstanding Italian film directors. Literature shaped by film experience and films dealing with the essence of cinematic form will be studied. This course may fulfill the film major requirement in theory.

H185. Special Studies for Honors Candidates. (3) Individual conferences. Prerequisites: 3.3 overall GPA, 3.5 GPA in the major and must have completed at least 18 upper division units in the major. Limited to Senior Honors Candidates. Directed study relating to the writing of an honors paper. (F,SP)

197. Field Studies. (1-4) Course may be repeated for credit. Two hours of fieldwork per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of Instructor. Supervised field programs involving experiences in schools and school-related activities. Regular individual meetings with faculty sponsor and written reports required.

198. Directed Group Study. (2-4) Course may be repeated for credit. To be arranged. Must be taken on a passed/not passed basis. Prerequisites: Students must have completed 60 units and have a minimum GPA of 2.0. Supervised group study of 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. Prerequisites: Must be taken on a passed/not passed basis. Restricted to senior students with overall GPA of 3.0 or better. Enrollment restricted according to College regulations. (F,SP)

Graduate Courses

*200. Italian Syntax, Lexicon and Composition. (3) One 3-hour seminar per week. An analysis of Italian syntax and lexicon, with exercises in critical language and exposition. Required for the M.A. in Italian.

*201. Historical Grammar. (3) One 3-hour seminar per week. History of Italian phonology and morphology. The course fulfills the Phylology requirement for the Ph.D. in Italian.

*202. Bibliography and Methods of Research. (3) One 3-hour seminar per week. A pragmatic inquiry into bibliography and the methodology of research. (SP) Costa

*203. Literary Criticism. (3) One 3-hour seminar per week. Studies in literary criticism from De Sanctis to Barzini.

*204. Contemporary Trends in Critical Theory. (3) One 3-hour seminar per week. Studies in the main currents of contemporary criticism and their application in the interpretation of literary texts.

*205. Studies in Literary Genres and Poetics. (3) Course may be repeated for credit when topic changes. One 3-hour seminar per week. An analysis of significant questions related to poetics and literary genres.

*208. Minor Medieval Authors. (3) One 3-hour seminar per week. Lyric and religio-didactic poetry, chronicles, novelle, and treatises.

209. Seminar on Dante. (3) One 3-hour seminar per week. Studies in the Divina Commedia and Dante's minor works. (SP) Stefanini

*211. Seminar on Petrarch. (3) One 3-hour seminar per week. Studies in Petrarch's poetry.

*213. Seminar on Boccaccio. (3) One 3-hour seminar per week. Studies in the Decameron and the minor works.

217. Studies in the Renaissance. (3) One 3-hour seminar per week. (F,SP)

*217A. Humanism. (3)

*217B. Theatre. (3)

217C. Ariosto. (3) (F) Clubb

*217D. Tasso. (3)

*217E. Machiavelli. (3)

218. The Age of the Baroque. (3) One 3-hour seminar per week. Studies in the thought and writings of the 17th Century. (F) Staff

*218. The Age of the Enlightenment. (3) One 3-hour seminar per week. Studies in the thought and writings of the 18th Century.

*221. Studies in the Nineteenth Century. (3) One 3-hour seminar per week.

*221A. Literary Theory and Polemics. (3)

*221B. Leopardi. (3)

*221C. Manzoni. (3)

*221D. Verga. (3)

223A-223B. Studies in the Twentieth Century. (3) One 3-hour seminar per week. Poetry and Theatre. (F) Biasin

236. Special Study. (2-4) Course may be repeated for credit. Individual conferences. Prerequisites: Students in Italian Ph.D. program. 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)

299. Directed Research. (6-12) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Limited to students engaged in research for the doctoral dissertation. (F,SP)

601. Individual Studies for M.A. Candidates. (1-6) Course may be repeated for credit with consent of graduate adviser. May not be used for unit or residence requirement for the Master's degree. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with faculty member with a view to the M.A. comprehensive examination. May be taken only in the semester of the Comprehensive Examination. (F,SP)

602. Individual Studies for Doctoral Students. (1-6) May not be used for unit or residence requirements toward the doctoral degree. Course may be repeated for credit with consent of graduate adviser. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with a faculty adviser. Intended to provide an opportunity for qualified graduate students to prepare for the Ph. D. Qualifying Examination. May be taken only in the semester of the Qualifying Examination. (F,SP)

Journalism (Graduate School of Journalism)

Office: 121 North Gate Hall, 642-3363 Dean: Tom J. Goldstein

Professors:

William Drummond (Associate Dean), M.S. Columbia University Graduate School of Journalism. Broadcast journalism, foreign policy, reporting

Timothy Ferris, B.S. N. Ghent University. Science writing, reporting

Tom Goldstein, J.D. Columbia Law School, M.S. Columbia University Graduate School of Journalism. Media criticism, journalism ethics, reporting

Thomas C. Leonard, Ph.D. University of California. Journalism history and literature

David Littlejohn, Ph.D. Howard University. Criticism, cultural reporting

A. R. W. Kaye-Dougall, M.S. Columbia University Graduate School of Journalism. Business reporting

Ben H. Bagdikian (Emeritus), A.B. Clark University. Media criticism, social issues, reporting

Edwin R. Bayley (Emeritus), B.A. Lawrence College. Political reporting

Joseph P. Lyford (Emeritus), B.A. Harvard University. Urban Journalism

Albert G. Pickrell (Emeritus), Ph.D. Stanford University. Law of Journalism

Bernard B. Taper (Emeritus), M.A. Stanford University. Magazine writing, biographical writing

Acting Associate Professor:

Lydia Chavez, M.S. Columbia University Graduate School of Journalism

Assistant Professor:

Susan Cohen, M.J. University of California. Magazine writing, reporting

Senior Lecturers:

Andrew A. Stem, B.A. Dartmouth University. Broadcast and journalism television documentaries

James C. Spalding (Emeritus), B.A. University of Michigan. Television history and literature

Science writing, reporting

Lecturers:

Joan K. Rezler, J.D. Bard College

James Brestaford

Carol Bryant

William Carlsen, M.J.

Ph.D. Columbia University Graduate School of Journalism

Director of Journalism

Public relations

Law of journalism

Public relations

Senior Lecturers:

James C. Spalding (Emeritus), B.A. University of Michigan.

9 Science writing, reporting

Phil Hager, B.A.
Harriet Heyman
Jane Kay
Pam King, B.A.
Ken Light, B.A.
Gerald Lubnow, A.B.
Chad Peiti
Raul Ramirez
Synthia Basky
Richard Reinhardt, M.S.
Mark Robinson, Ph.D.
Pete Schott, B.A.
Rebecca Smith
David Sylvester, M.A.
David Tong
William Turner, J.D.
Carolyn Walkeman, Ph.D.
David War, B.A.
Linda Wams, M.J.
William Wong

Graduate Advisers: Mr. Drummond, Mr. Leonard, Mr. Littlejohn, Mr. Stern.

Graduate Program

For a description of the graduate program in journalism, see page 78.

Lower Division Courses

39. News and the Underdog in American Society. (3) Two to three hours seminars per week. Case studies of how the mainstream press has covered minorities since the Civil War era. The performance of the minority press and the operation of interpretive communities. Emphasis on race, class, and the development of American journalism. (F) Leonard

98. Directed Group Study in Journalism. (1-4) Course may be repeated for credit. To be arranged. Must be taken on a passed/not passed basis. (F,SP) Staff

Upper Division Courses

100. Introduction to News Reporting. (4) Three hours lecture and discussion plus eight hours of field work per week. Survey of journalistic principles and practices, and study and practice of methods of gathering, writing, and editing news. Sections limited to 15 students. (F,SP) Staff

101. Advanced Reporting for Journalists. (4) May be repeated for credit under certain circumstances. Three hours lecture and discussion plus eight hours of field work per week. Prerequisites: 100 and consent of instructor. An extension of Journalism 100 for students who seek additional instruction and practice in gathering, writing, and editing news, editorials and features. Sections limited to 15 students. (F,SP) Staff

110. Colloquium (Undergraduate). (1) Course may be repeated for credit. One and one half hours of lecture and discussion per week. Must be taken on a passed/not passed basis. Introduction to various branches of the journalism profession by means of workshops, case studies and discussions with the faculty of the School of Journalism and visiting professionals. (F,SP) Reinhardt

140. History of the American Press. (3) Three hours lecture and discussion per week. How "news" has been defined, discovered and communicated from colonial times to the present. This survey places journalism in the context of American political institutions and literature. The course studies changing attitudes about free speech, privacy and equality in America. Students will do research on the role of the press in a campaign for political or social reform. (F) Leonard

141. The Mass Media and Society. (3) Three hours of lecture per week. Critical analysis of the structure and dynamics of contemporary mass media and their impact on society. (SP) Goldstein

151. Reporting as Literature. (3) Three hours of lecture and discussion per week. Study of selected works of outstanding writing for the American and European press from the eighteenth century to the present. (SP) Littlejohn

163. Propaganda and the Mass Media. (3) Three hours of lecture and discussion per week. A survey, beginning in the 18th century, of the origins and effects of attempts at mass persuasion. Shifting concepts of public opinion, propaganda and public relations will be analyzed. There will be substantial reading and writing assignments on the flow of information to Americans during wartime. (SP) Leonard

165. Legal Aspects of the News Media. (3) Three hours of lecture, discussion and field work per week. Analysis of legal rights and restrictions on the news media, including tort law, press liability, libel, invasion of privacy, subpoena of reporters, access to meetings and judicial proceedings, copyright and broadcast law.

175. The Critical Review. (4) Three hours of lecture, discussion and field work per week. Prerequisites: Consent of instructor. Weekly written assignments, readings and discussion in the field of critical reviewing (books, film, drama, music, art and architecture). (F) Littlejohn

180. Issues in Television Journalism. (3) Three hours of lecture, discussion and field work per week. An evaluation of television news and documentaries from 1950 to the present. Course will analyze local and network news programs, examine problems journalists face working with the broadcast industry, the role of the FCC and the future of television. (SP) Bieder, Stern

197. Field Study in Journalism. (1-2) Course may be repeated for credit. Must be taken on a passed/not passed basis. Supervised experience in the practice of journalism in off-campus organizations. Individual meetings with faculty sponsor and written reports required. See Additional Information, "Field Study and Internships." (F,SP) Staff

198. Directed Group Study in Journalism. (1-4) Course may be repeated for credit. Seminar with three hours of lecture and discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Total grade point average of not less than 3.0 and consent of instructor. Enrollment restrictions apply; see department. (F,SP) Staff

200. Reporting the News. (5) Five hours of seminar and 15 hours of field work in news. In this course, students are taught the fundamentals of reporting and writing news stories and of collecting information. Close individual attention is given to each student's reporting and writing. Required in the fall term of first year. (F) Chavez, Cohn, Drummond, Goldstein, MacDougall

201. Advanced News Reporting. (4) Three hours of seminar, eight hours of field work in news reporting per quarter. Prerequisites: 200 or consent of instructor. Advanced study of reporting in more complex subject areas and more sophisticated writing styles. (F) Chavez, Cohen

205. News Editing. (2) Three hours of lecture and laboratory per week, plus outside assignments and reading. Must be taken on a satisfactory/unsatisfactory basis. Study of the principles and practices of news editing, copyediting, headline writing, and makeup, with later emphasis on creative editing and critiques of manuscripts. (F,SP) Staff

210. News Photography. (2) Two hours of lecture and discussion plus four hours of laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Prior photography coursework; for others, consent of instructor. Students will study and practice such topics as darkroom techniques and exposure and composition. (SP) Goldstein

220. Investigative Reporting. (4) Four hours lecture and discussion plus eight hours of field work per week. Prerequisites: 200 or consent of instructor. Study of investigative reporting, analysis of its techniques with outside reporting assignments. (F) Staff

221. Reporting as Literature. (3) Three hours of lecture and discussion per week. A study of outstanding examples of journalistic literature. (SP) Littlejohn

222. Reporting on Social Issues. (4) Three hours lecture plus eight hours of field work per quarter. Prerequisites: For journalism students, 200, all others consent of instructor. Work on a selection of major social problems of contemporary society, acquaintance with current developments in the social sciences relating to the problems, exposure to contrasting views, and writing of articles that will aid public understanding. (F,SP) MacDougall

226. Science Reporting. (4) Three hours lecture and discussion plus eight hours of field work 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) Ferris

227. Reporting of Cultural Events. (4) Three hours lecture and discussion plus eight hours of field work per week. Advanced study of reporting and critical writing in the arts, fine arts, literature, and architecture. (F) Littlejohn

228. Political Reporting. (4) Three hours lecture and discussion plus eight hours of field work per week. Prerequisites: For journalism students, 200 or equivalent; for others, consent of instructor. Study and discussion of politics and how they shape the American political and social system. (SP) Staff

229. Science and Society. (3) Three hours lecture and discussion per week. Case studies in the interaction between scientific research and the wider communities from the Greek atomists to twentieth-century technology and society. See Additional Information, "Field Study and Internships." (SP) Staff

230. Business Reporting. (4) Three hours lecture and discussion plus eight hours of field work per week. Prerequisites: 200 or consent of instructor. Study of business reporting, analysis of its techniques with outside reporting assignments. (F) Staff

234. Reporting International Affairs. (3) Three hours lecture and discussion per week. Study and analysis of techniques of reporting international affairs, and production of discussion papers and news reports. Limited to fifteen. (SP) Chavez, Drummond

240. History of American Journalism. (3) Three hours lecture and discussion per week. The social and political conditions that shaped the American press from colonial era to present. (F) Leonard

242. Writing of Profiles, Personality Sketches, Short Biographies. (4) Three hours of lecture and discussion and eight hours of field work per week. Prerequisites: 200 or consent of instructor. Study of biographical writing from profile to essay and writing profiles under varying conditions. (F) Taper

245. Social Aspects of the Mass Media. (3) Three hours of lecture and discussion per week. Critical evaluation of the mass media, discussion of problems of ethics and responsibility, and the production of several research papers. (SP) Goldstein

246. Ethical Issues in Journalism. (3) Three hours lecture and 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

250. Investigative Reporting. (4) Three hours lecture and discussion plus eight hours of field work 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 and discussion per week. A study of outstanding examples of journalistic literature. (SP) Littlejohn

252. Magazine Article Writing. (4) Three hours lecture and discussion plus eight hours of field work per week. Prerequisites: 200 or consent of instructor. Advanced study of magazine writing, with emphasis on the development of ideas of importance to science writers today. Background in science welcome, but not required. (F) Ferris

260. Business Reporting. (4) Three hours lecture and discussion plus eight hours of field work per week. Prerequisites: 200 or consent of instructor. Study of business reporting, analysis of its techniques with outside reporting assignments. (F) Staff

263. Public Opinion, Propaganda and the Mass Media. (3) Three hours of lecture and discussion per week. Prerequisites: Consent of instructor. Advanced study of public opinion and information techniques im-

*Not offered 1991-92
On leave, spring, fall
On leave, fall
A distinguished teacher service
Recipient of Distinguished Teaching Award
important to journalists from World War I to the present. Each student will do major research. (SP) Leonard

267. Law for Journalists. (3) Three hours of lecture and discussion per week. Study of courts and procedure, legislative bills, criminal law, evidence, prior restraint, fair trial/free press, libel, privacy subpoenas of reporters, Freedom of Information Act, broadcast law, relationship of reporter to publisher. (SF) Staff

268. Law for Legal Affairs Reporting. (3) Three hours of lecture and discussion per week plus field work. Examination of the structure and philosophy of the legal system to prepare the journalist for reporting legal affairs. (SF) Staff

275. Radio News Reporting. (4) Four hours of lecture and discussion and five hours of field and laboratory work per week. Study of techniques, practices, and methods of gathering and writing radio news. Students will produce weekly live radio news programs. Enrollment is limited to 15. (SF) Drummond

282. Introduction to Television News. (4) Four hours lecture and discussion and five hours of field and laboratory work per week. Study of the history and institutions of broadcast journalism (nine weeks), practice, techniques of reporting news for radio and television. (F) Bieder, Riggs, Stern

283. Reporting for Television. (6) Six hours of lecture and discussion and twenty-four hours of field work and laboratory work per week. Prerequisites: 282 and consent of instructor. Production of daily writing, directing, and videotaping of live weekday television news programs. (SP) Bieder, Riggs, Stern

284. Documentary News Films. (4) Three hours of lecture and twelve hours of laboratory and field work per week. Prerequisites: 200 and consent of instructor. Production of television documentary news programs. (F) Bieder, Riggs, Stern

286. Professional Project (Thesis) Seminar. (3) Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Seminar in methods of research, organization, and preparation of master's theses and professional thesis projects. Required of M.J. candidates working on thesis projects. (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 in off-campus organizations. Individual meeting with faculty sponsor and written report required. (SF) Staff

298. Special Group Study in Journalism. (1-3) Course may be repeated for credit. Units of credit to be determined by the instructor. Group study. For students who wish to pursue a special program of study and research not covered by any other course or seminar. (F,SP) Staff

299. Individual Study. (1-3) Course may be repeated for credit. Individual study. Supervised individual study and research. (F,SP) Staff

601. Individual Study for Master's Students. (1-6) Course may be repeated for credit with consent of graduate adviser. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with thesis adviser leading to completion of M.J. Thesis or Thesis project. Units may not be used to meet either unit or residence requirements for a master's degree. (F,SP) Staff

Landscape Architecture
(College of Environmental Design)

Department Office: 202 Wurster Hall, 642-4022
Chair: Randolph T. Hester, Jr., M.L.A.
Professors:
Sally K. Ferraro, Ph.D. Institutional and legal aspects of natural resource administration
Randolph T. Hester, Jr., M.L.A. Community participation, neighborhood design
Allan B. Jacobs, M.G.A. Urban design and planning
Michael M. Laurie, M.L.A. History, urban parks, design
Clare Cooper Marcus, M.A., M.C.P. Social behavior, housing and open space
Joe R. McBride, Ph.D. Vegetation and ecological analysis
Robert H. McEachern, Ph.D. Regional planning assessment, public land management
Garret Ekoob (Emeritus), M.L.A. Landscape design, design theory
William Garnett (Emeritus), Landscape photography
Luisa L. Leopold (Emeritus), Ph.D. Hydrology
R. Burton Litton, Jr. (Emeritus), M.L.A. Visual analysis and aesthetics
Richard L. Miller (Emeritus), Ph.D. Third world environments, resources conservation
William Rosenbaum, Ph.D. Landscape architecture, urban design
Francis Violich, B.S. (Emeritus) City planning and design

Associate Professors:
Paul C. Groth, M.L.A. American cultural landscapes, landscape theory and ideology
Michael Southworth, Ph.D., M.C.P., B. Arch. Urban design and planning

Assistant Professors:
Walter J. Hood, M.Arch., M.L.A. Community design, landscape design, site planning
G. Mathes Kondolf, Ph.D. Geography, environmental engineering
Patricia O'Brien, M.L.A. Landscape design, historical design predecessors
John D. Radke, Ph.D. University of British Columbia. Geography, geographical information systems in landscape analysis and environmental planning
Chip Sullivan, M.L.A. Landscape design and art, graphics

Lecturer:
Russell A. Beauty, M.L.A. Urban forestry, horticulture and planting 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 open space and natural amenities; landscape 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 programming; site planning of buildings and building complexes; and the 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 applications, recreation planning, and urban open space and transportation systems. The intent of all the emphases is the creation of joyful landscapes that are ecologically sound and socially informed.

Undergraduate Program
The four-year curriculum leading to the A.B. degree in environmental design with a major in landscape architecture provides a general education in environmental design and prepares the student for subsequent graduate education or entry-level work in the field. The emphasis is on design. The A.B. degree is approved by the State of California licensing board. Students who complete the degree will become eligible to take the state examination after fulfilling a two-year apprenticeship under a licensed landscape architect.

Required core courses represent a minimum basic coverage in theory, design, and technology, but the program provides an opportunity to study more intensely all aspects of landscape architecture, including landscape analysis and planning, urban design, recreation, urban design, construction technology, 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 accredited by the American Society of Landscape Architects. The program offers advanced work in landscape architecture from the scale of detailed form to that of the regional landscape. A common core of courses in the department is required of all students, emphasizing the relationship between the design and the environmental planning aspects of the field. This core group forms the foundation for extended course work in landscape design, urban design, and environmental planning.

Current faculty research and professional involvements include growth impact and land use planning, human factors and design, environmental simulation, landscape visual and scenic assessment, ecosystem, 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 and Environmental Planning. The departments of Landscape Architecture and City and Regional Planning jointly offer a program in urban design or environmental planning, leading to both the Master of Landscape Architecture and Master of City Planning degrees. Applicants must be admitted separately by both the Department of Landscape Architecture and the Department of City and Regional Planning.

The usual procedure is for applicants to apply to either department, and then submit an application to the other department by January 15 of the first academic year in residence. Acceptance into a concurrent program is not automatic and is limited to outstanding applicants. More information may be obtained from the graduate assistant in 206 Wurster Hall.

The Ph.D. Degree in Environmental Planning. The Doctor of Philosophy program in environmental planning is offered for students who want to pursue scholarly and research work beyond the master's level. The program emphasizes the development of theories and methods that underlie the fields of environmental planning or urban design, and the processes of planning and design as they relate to the solution of problems in the natural and urban environment. The Ph.D. degree in environmental planning is appropriate for those seeking careers in research and teaching in environmental planning or urban design, and for assumed roles in government or professional consultation.

The program is centered around a core field of environmental planning and design. Students (in consultation with their program adviser) build upon this basic core through additional course work and research designed to develop an individual area of specialization within the field of environmental planning.

There are no required courses for the Ph.D. degree. Students and their advisers determine each program individually. Ph.D. requirements are as follows: 32 units of upper division and graduate level course work, two years of course work, and a thesis. The degree again requires a thesis. The Ph.D. degree is evaluated annually by the Ph.D. Committee.

Admission is granted to a small number of individuals each year. It is anticipated that 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 Assistant, Department of Landscape Architecture, 206 Wurster Hall.

For more detailed information about the graduate program, consult the Announcement of the College of Environmental Design and the graduate advisors in the Department of Landscape Architecture.

Lower Division Courses:

- **10. Ecology in the Design of the Physical Environment.** Three hours of lecture and one hour of discussion per week. The overall goal of this course is to provide an understanding of the various forces that shape the human environment, with a particular focus on ecological determinants. Topics included in the course will be explorations of environmental issues at local, regional, national and global scales; the interaction between human activities, environmental considerations and built form; and a consideration of future trends and possibilities. Staff

Upper Division Courses:

- ** Upper Division Courses **

101. Fundamentals of Landscape Design. (5) Two hours lecture and six hours of studio per week. Prerequisites: 11A and 11B. Architecture and planning majors admitted by consent of instructor. Formerly 101. This course introduces the student to the principles, methods, and techniques of design. Lectures and seminars will be devoted to the topics of professional design and practice. Staff

102. Case Studies in Landscape Design. (5) Two hours lecture and six hours studio per week. Prerequisites: For majors 101. Architecture and planning majors without 101 admitted by consent of instructor. Formerly 102. This course stresses the shaping and coordination of ideas from initial concept to completion. Emphasis is given to development of form, scale, context, nature of site and other small spaces. Orientation to the design of commercial, institutional, residential, and other total environments. Staff

103. Design of Urban Landscapes. (5) Two hours of lecture and six hours of studio per week. Prerequisites: For majors 102. Architecture and planning majors without 101 admitted by consent of instructor. Formerly 103. This course focuses on larger-scale urban problems, including design for the pedestrian and automobile, a waterfront, town center, streetscape, or reuse of derelict land. Lecture modules on selected professional topics are integrated into the course. (F) O’Brien.

104. Ecological Analysis. (4) Three hours of lecture and 4 hours of field laboratory per week. Analysis of environmental factors, ecosystem functions, and ecosystem dynamics, as related to decision-making for landscape planning and design. (F) McBride.

110. Introduction to Landscape Plants in Design. (3) Two hours lecture per week. Prerequisites: Botany 10 or equivalent. Fundamentals of plant growth, nomenclature and design characteristics, cultural influences of climate and soils; historic and contemporary uses of plants in design; planting design principles. (F) Prayle.

112. Landscape Plants and Horticulture. (3) Two hours of lecture and six hours of laboratory per week. Prerequisites: 111; Integrative Biology 15, 15L. Formerly 111L and 112. Field observation and identification of woody and herbaceous species most suitable for use in Central California; horticultural techniques for landscape plants including plant selection, soils, pruning, planting techniques and pest management. Individual graphic exercises and research reports required. (SP) Staff.

113. Regional Landscape Plants (Special Schedule Course). (2) Six hours of field laboratory per week for seven weeks. Formerly Ld Arch 110. Field observation, identification and discussion of native and introduced plants for landscape design; emphasis on water conservation, ecological adaptation and landscape management. Individual graphic exercises on selected topics. (SP) Beauty

120. Topographic Form and Design. (4) Two hours of lecture and six hours of studio per week. Prerequisites: 120. Theory and materials; design of landscape structures and utilities. Studio problems in design detailing. (F) Staff

121. Design of Landscape Structures. (4) Two hours of lecture and two hours of field work per week. An exploration of wildlands as a landscape resource, stressing visual composition, environmental design and resource management decisions may be given form and relationships through design. Staff

130. Introduction to Landscape Architecture. (3) Three 1-hour lectures per week. Survey of landscape architecture and the way people use space, time and place, including the garden, parks, and public open spaces. Land use planning and environmental protection. Discussion of design process and professional practice. (F) Laurie

131. Design Implications in Forestry and Resource Management. (2) Two hours of lecture and two hours of field work per week. An exploration of wildlands as a landscape resource, stressing visual composition, environmental design and resource management decisions may be given form and relationships through design. Staff

134. Advanced Graphics for Landscape Architecture. (3) Three 2-hour studios per week. Prerequisites: Environmental Design 11A or 11B or Landscape Architecture 230 or consent of instructor. Freely-hand and formal approaches to graphic representation of design concepts. (SP) Hood

140. Social and Psychological Factors in Open Space Design. (3) Three hours lecture and one 1-hour discussion of students' office experience. (SP) Staff

141. Environmental Planning Studio. (3) Three 1-hour lectures per week. Prerequisites: Environmental Design 11A or 11B or Landscape Architecture 230 or consent of instructor. Fieldwork and formal approaches to graphic representation of design concepts. Lecture modules on selected professional topics are integrated into the course. (F) Tissue.

160. Professional Practice Seminar. (1) Two hours of seminar per week for eight weeks. Formerly 260. Professional methods and approaches in the practice of landscape architecture and environmental planning. Lecture, discussion, and critique of the application of professional practice. (F,SP) Staff

170. History and Literature of Landscape Architecture. (3) Two 1-hour lectures per week. Developmental history of landscape design practice and professional associations. Student research reports. (SP) Staff.

170. History and Literature of Landscape Architecture. (3) Two 1-hour lectures per week. Developmental history of landscape design practice and professional associations. Student research reports. (SP) Staff.

179. Fundamentals of Plant Growth, Ecology, and Conservation. (4) Two hours of lecture and six hours of studio per week. Prerequisites: 11A or 11B. Emphasis on the role of plants and ecosystems in the environment. (F) Taylor

190. Supervised Independent Study. (4) Two hours of lecture and six hours of studio per week. Prerequisites: 201 or consent of instructor. Formerly 49A. A site design studio stressing the shaping and control of ideas from complete design of open space in various contexts. Typical projects will be of an intermediate scale and might include a park, plaza, museum sculpture garden, playground, office park or housing project. Staff

200. Advanced Project Design. (4) Two hours of lecture and six hours of studio per week. Prerequisites: 201 or consent of instructor. Formerly 202. This studio seeks alternatives for new development at the urban scale that are both ecologically and aesthetically informed. Projects are at medium to large scale and include new residential areas, work places, and community and shopping centers. Addresses issues of development, 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.

201. Design of Landscape Sites. (4) Two hours of lecture and six hours of studio per week. Prerequisites: 201 or consent of instructor. Formerly 200A & 200B. A site design studio stressing the shaping and control of ideas from complete design of open space in various contexts. Typical projects will be of an intermediate scale and might include a park, plaza, museum sculpture garden, playground, office park or housing project. Staff

202. Redesigning the Urban Edge. (4) Two hours of lecture and six hours of studio per week. Prerequisites: 201 or consent of instructor. Formerly 202. This studio seeks alternatives for new development at the urban scale that are both ecologically and aesthetically informed. Projects are at medium to large scale and include new residential areas, work places, and community and shopping centers. Addresses issues of development, 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.

204. Advanced Project Design. (2) 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, landscape as a public and energy conserving design. For current offerings, see department announcement. (F,SP) Hester.

205. Environmental Planning Studio. (3) Six hours of studio per week. Prerequisites: 201 or consent of instructor. Formerly 203. Application of environmental planning principles to a complex problem involving a variety of environmental criteria and desired land uses in a complex institutional and political setting. Student teams will identify needed data, assess environmental and developmental problems, weigh competing uses, and prepare an environmental management plan. (SP) Twiss.

220. Environmental Geology for Planners. (3) Three hours of lecture and four hours of laboratory per week. Prerequisites: Geography 1 or Geology 50, 50L, 50L-C; consent of instructor. Formerly 220. This course emphasizes understanding of geologic hazards, notably: seismic hazards, landslides and other mass movements, flooding, coastal erosion, and soil erosion. Students will be introduced to hazard mapping, effective use of aerial photography, and hydrologic analysis are emphasized in the laboratories, most of which are held in the field. Critical reading of technical reports and improvement of communication skills. (SP) Staff.

221. Quantitative Methods in Environmental Planning. (3) One 1-hour lecture and one 3-hour laboratory per week. Discussion of the application of quantitative methods to environmental assessment, analysis, and evaluation in environmental planning. Topics to include geographical information.
systems and data bases, remote sensing, and multiangle analysis. This course emphasizes computer applications and data analysis. (F) Staff

222. Hydrology for Planners. (3) Two 1-hour lectures and one 2-hour laboratory per week. Reliation of rainfall to runoff, development of the storm hydrograph; effects of urbanization; determination of flood frequency; effect of man's activity on runoff. (SP) Kondolf

223. Introduction to California Landscapes. (1) One 1-hour lecture/discussion per week plus two field trips (total of four days). Must be taken on a satisfactory/unsatisfactory basis. Introduction to the ecology, visual characteristics, land use, and design history of the major landscape regions in California. (SP) Laurie, McBride

224. Vegetation Analysis and Management. (3) Two 1-hour lectures and one 4-hour 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. McBride, Beauty

225. Urban Forest Planning and Management. (3) Two hours of lecture and four hours of laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Introduction to the role of urban forests, legal and role in contemporary towns and cities. Emphasis on planning and management of the urban forest, restoration of old parks, street trees, and community participation. (F) Beauty, McBride

226. Landscape Design Construction. (3) Six hours of studio per week. Prerequisites: 120 and 120L. Advanced problems in landscape design, investigated in terms of construction detailing, land form alteration, and implementation on specific sites. Staff

230. Communications in Landscape Architecture. (3) Three 3-hour studios per week. Discussion of the theory and practice of communication in landscape architecture and environmental planning. (F) Sullivan

232. The Landscape As a Visual Resource. (3) Two 1-hour lectures per week and two field trips (total of three days). Visual analysis of wildlands landscapes, inventory procedures, problems in landscape evaluation, and design policy development, especially related to public wildlands. (SP) Laurie, McBride

233. Environmental Law and Resource Management. (3) Two 1½-hour seminars per week. Prerequisites: Consent of instructor. Formerly IDS 233A. An introduction to the legal system governing the utilization 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, environmental impact assessment, permit systems for development control, pollution control, natural resource planning law. (SP) Staff

234. Computer Applications in Landscape Architecture. (3) Two 1-hour lectures and one 3-hour laboratory per week. Introduces students to the application of computers in landscape design; covers applications in computer mapping and graphics; landscape construction; planning design, and data base management; class problems using computer hardware and software in central campus and departmental computing facilities. (SP) Staff

235. Environmental Simulation and Public Communication. (2-4) Two hours of lecture and six hours of laboratory per week. Introduction to the theory of experimental simulation and presentation of case studies in the use of models and media in citizen participation and environmental design; instruction in model-making, slide photography, video-taping, use of the environment in film-making, script writing, and presentation design. Exercises and projects. (SP) Bosseilhann

236. Advanced Seminar in Land Use and Environmental Planning. (3) Course may be repeated for credit. Two 1½-hour seminars per week. An advanced investigation of current problems in land use and environmental planning, 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; supra-local land use controls; water resources and law and policy; public lands, coastal zone management; hazardous lands; resource extraction. (SP) Staff

237. The Process of Environmental Planning. (3) Two 1½-hour lecture/discussions per week. Prerequisites: IDS 232. A review of the techniques used in environmental planning, and evaluation of alternative means of integration in environmental protection and political processes. 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 data, legal and political constraints, conflicts among specialists. (F) Twiss

238. Environmental Policy Planning. (3) Two 1½-hour lectures per week. Collective intervention into the living environment. How is action taken? Effects upon quality of life measures. Advanced planning methods, including risk management, criteria of preservation. Discusses approaches to real estate and resource-conserving lifestyles. Employs community ecology design compatible with conservation policies. Staff

239. Public Land and Resource Planning and Administration. (3) Three hours of lecture/discussion per week. Prerequisites: IDS 130 or IDS 233B. An overview of federal/state wildlife area development, natural resource planning, and public lands policy. (F) Sullivan

251. History and Theories of Landscape Architecture and Environmental Planning. (2) One 2-hour seminar per week. Investigation of the major ideas in landscape architecture and environmental planning. Review of history and theory from the classical and contemporary literature. Topics may include: ecological determinism, rationalism, ethics, social and economic values, cultural values, environmental conservation, and the role of the professional. (F) Hester

252. Thesis and Professional Project Research Seminar. (2) Two hours of lecture/discussion per week. Approaches to research methods, including the case study, the survey, the experiment, and the historical 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) Fairfax

254. Doctoral Seminar in Landscape Architecture and Environmental Planning. (3) Course may be repeated for credit. Three hour seminar or alternate research under the direction of a faculty sponsor. Supervised experience relative to specific aspects of practice in landscape architecture and environmental planning, and/or environmental planning. Regular meetings with faculty sponsor required. See departmental sheet for other limitations. (F,SP) Staff

255. 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 to qualified students who have been advanced to candidacy for the Ph.D. degree and are directly engaged upon the doctoral dissertation. (F,SP) Staff

271. Directed Field Study. (2-5) Any combination of IDS 290 and IDS 297 may be taken for a maximum of 20 units toward the M.L.A. degree. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and consent of instructor and sponsor. Supervised experience relative to specific aspects of practice 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

272. Supervised Field Study. (2-5) May be repeated for credit. Hours to be arranged. Supervised experience relative to specific aspects of practice 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

273. Thesis and Professional Project Research Seminar. (2) Two hours of lecture/discussion per week. Approaches to research methods, including the case study, the survey, the experiment, and the historical 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) Fairfax

275. Doctoral Seminar in Environmental Planning. (1) Course may be repeated for credit. Three hour seminar or alternate research under the direction of a faculty sponsor. Supervised experience relative to specific aspects of practice in landscape architecture and environmental planning, and/or environmental planning. Regular meetings with faculty sponsor required. See departmental sheet for other limitations. (F,SP) Staff

276. Supervised Teaching in Landscape Architecture and Environmental Planning. (1-3) 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 or Graduate Research Assistant. (F,SP) Staff

Professional Courses

290. Supervised Teaching in Landscape Architecture and Environmental Planning. (1) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Energy supply at the community scale through development of locally available renewable energy resources (solar, wind, water, and biomass). Architecture, site planning and urban development; review of conservation and supply technologies. For students in design, planning, energy,

IDS 241. The Urban Environment. (3) Two 1-hour seminars and one 3-hour laboratory per week. The comprehensive understanding of the urban environment, environmental problems, attitudes and criteria. Environmental survey, analysis, and interview techniques. Methods of addressing environmental quality. Environmental simulation. Sponsoring departments: City and Regional Planning and Landscape Architecture. (F) Bosselmans, Jacobs (F)

IDS 249. Urban Design in Planning. (3) Three hours of seminar and discussion per week. Prerequisites: Consent of Instructor. This seminar will focus on urban design in the planning process, the role of environmental planning, methods of community involvement, problem identification, goal formulation and alternative generation, environmental media and presentation, design guidelines and review, environmental evaluation and impact assessment. Case studies. Sponsoring departments: City and Regional Planning and Landscape Architecture. (SP) Jacobs

Related Courses in Other Departments

Environmental Design 104. Site Planning. (3)
Environmental Design 169B. History of the U.S. Cultural Environment, 1900-1970. (3)

Latin American Studies

(College of Letters and Science)

Undergraduate Group Major in Latin American Studies

Group Major Office: International and Area Studies, 201 Moses Hall, 642-4646
Adviser: Candace Slater (Department of Spanish and Portuguese/Comparative Literature)

The group major in Latin American studies is designed to present a balanced curriculum of the history, language, literature, culture, and environment 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 (1) students desiring a general education focused on the Latin American cultural regions; (2) students planning to enter business, government, or international agency service; and (3) students preparing to teach social science or language.

Please check with the Group Major Office regarding current eligibility requirements and application procedures. At the time this catalog was published, revisions were under consideration.

Lower Division. Spanish 1, 2, 3, 4 (or equivalent) or Portuguese 1, 2, 3, 4 (or equivalent); History 6A-8B.

Upper Division. A minimum of 30 upper division units, but not more than 36, distributed as follows: Portuguese 101A (or the equivalent); Spanish 104A-104B or Portuguese 104 and 128; two approved upper division courses in the department of History; and five upper division courses, at least two of which must be in a single field other than history, Portuguese or Spanish, as appearing on the list of approved courses (given below) and selected in consultation with a group major adviser.

List of approved courses: Anthropology 175, 176, 177, 178; Geography 131, 154, 155, 156, 157, 158; History 103E, 140, 141A, 141B, 142, 143, 144; Music 137; Political Science 148A, 148B; Portuguese 102, 104, 114, and 128 (if not included in core courses), 134 (when topic is appropriate), 150; Spanish 100, 102A-102B, 104A-104B (if not included in core courses), 113, 114, 125, 130, 131, 135 (when topic is appropriate), 138, 144, 185 (when topic is appropriate).

Note: Beyond the basic list given above, any special topic class or special course other than 199 may be approved by the adviser as an elective if the subject matter is appropriate.

Honors Program. With consent of major adviser. Students must complete an overall grade-point average of 3.0 or higher and a grade-point average of 3.3 or higher in courses completed in the major. Students accepted into the honors program will enroll in Latin American Studies H195 for the preparation of a senior thesis.

Graduate Programs

Graduate Group Office: International and Area Studies, 201 Moses Hall, 642-4646
Advisers: Lydia Chavez (Journalism), Silvia Guendelman (Public Health), Gwen Kirkpatrick (Spanish/Portuguese), Michel Laguerre (Afro-American Studies), Bela Saragossa (Chicana Studies).

Please check with the Group Major Office regarding current eligibility requirements and application procedures. At the time this catalog was published, revisions were under consideration.

Master's Degree. The M.A. program in Latin American Studies provides an opportunity for interdisciplinary work on Latin America at the immediate post-baccalaureate level. Candidates must have a bachelor's degree, a reading knowledge of either Spanish or Portuguese, and adequate grade standing. Applicants from the United States must take the Graduate Record Examination (GRE) aptitude test, and foreign students must achieve a minimum score of 550 on the Test of English as a Foreign Language (TOEFL). A high score on the TOEFL is desirable. Samples of written work must also be submitted; Admission is limited by the number of places allotted to the program.

The formal requirements for the M.A. degree are 20 units of course credit and a thesis, following the University's Plan I for a master's degree, or 24 units of course work following Plan II. Students must complete at least two or three departments, although courses in a broader range of departments may be taken if appropriate to a student's intellectual concerns. Students' programs must include at least two courses or 8 units (three courses or 12 units under Plan II) at the graduate level in each of two departments, and an additional graduate credit earned for writing the master's thesis. The remaining courses for the required units are chosen in consultation with an adviser. While the program will consist primarily of courses focused explicitly on Latin America, at least one course with a comparative, theoretical, or methodological contribution to study of Latin America must also be included. The language requirement for the degree is a high level of proficiency in Spanish or Portuguese and a basic knowledge and speaking knowledge of the other language. Work on the master's thesis will be carried out in consultation with a three-member thesis committee. No final examination is required.

Doctoral Degree. The Ph.D. program in Latin American Studies is intended for more advanced study for students with a complete basic area of study and a high degree of intellectual maturity and independence. Students in this program will have well-defined interdisciplinary interests that do not fit well within the confines of departments, and most students do not plan to pursue traditional academic careers. Due to the limited number of places allotted to the program, only very few students can be admitted in any given year. Candidates must have a master's degree or have completed equivalent graduate study. This previous work need not be in Latin American studies but should be clearly related to the proposed program of study. GRE scores, TOEFL scores when appropriate, and samples of written work must be submitted by candidates for the Ph.D. degree.

Students in the Ph.D. program concentrate their work primarily in three or four departments. Courses in these departments should be selected in consultation with a faculty adviser within each department. The language requirement for the degree is a high level proficiency in reading, speaking, and writing Spanish or Portuguese, a strong reading and speaking knowledge of the other language, and a reading knowledge of a third language chosen in consultation with an adviser. Upon successfully completing the examination, students will be advanced to candidacy and will prepare a doctoral dissertation under the guidance of a three-member faculty committee.

Upper Division Courses

H195. Honors in Latin American Studies. (3) Individual conferences. Prerequisites: Senior standing with a minimum GPA of 3.0 in the major, and for all work completed in the University. Consent of group major adviser. Honors Thesis. (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. Mandatory for Latin American Studies graduate students. Students by faculty and advanced graduate students on their current research on Latin America. (F)

209. Field Methods for Research in Latin America. (4) Three hours seminar and one hour individual consultation per week. Prerequisites: Consent of instructor. Field methods and techniques, emphasizing Latin America as area of research. Proposal writing, research design, ethical considerations, interviewing, participant observation, quantitative methods, analysis and write-up of field data. Supervised field exercises. (F,SP)

Law

(School of Law)

Office: 225 Boalt Hall, 642-1741
Professors:
Thomas G. Barnes, D.Phil. English legal history. Shari Barnett, LL.B. California Supreme Court, media law.
Beate B. Barton, LL.B. (Adrian A. Kragen Professor) Taxation.
Belinda M. Canady, J.D. (Robert L. Bridges Professor) Law and education, contracts.
John E. Coons, J.D. (Robert L. Bridges Professor) Law and education, contracts.
Robert Cooler, Ph.D. Law and economics, financial law.
James E. Crawford, J.D. Bankruptcy, contracts.
Maurice Cohen, LL.B. (Robert L. Bridges Professor) Law and jurisprudence.
Robert F. Dyer, Ph.D., J.D., Ph.D. Environmental law, administration law.
Malcolm M. Feeley; Ph.D. Court reform, criminal justice.
James H. Hall, J.D. (Robert L. Bridges Professor) Environmental law, taxation, administration law.
Edward C. Halbach, Jr., LL.M., LL.D. (Walter Perry Johnson Professor) Estates and gift taxation, trusts and estates.
Lawrence Haefeli, J.D. (Robert L. Bridges Professor) Environmental law, taxation, administration law.
Ira M. Heyman, J.D., LL.B. (Chancellor Emeritus) Environmental law, taxation, administration law.
Philip E. Johnson, J.D. Criminal law and procedure.

*Not offered 1991-92
†Recalled to active service
‡Recipient of Distinguished Teaching Award
Graduate Courses

First Year

The first semester program is composed of four prescribed courses. Three of the classes are in large sections with approximately 110 students in each. The fourth is a small section of 25 to 30 students. In the second semester, four courses are prescribed. There are large sections and small sections in each of the first-year courses except Law 205, which is all small sections.

Civil Procedure. (3,3) Credit and grade to be awarded upon completion of the sequence. The principles of pleading under the code system and the federal rules; modern trial practice, including venue, process, the jury, sufficiency of evidence, instructions, verdicts, new trials, judgments, and appeals. (F,SP)

Constitutional Law. (3) An introduction to the subject covering judicial review and justiciability, federalism, separation of powers and substantive due process. (F,SP)

Contracts. (3,3) The law of contracts, dealing with the problem of formation, operation, and termination. (F,SP)

Criminal Law. (4) An introduction to criminal law and procedure with primary emphasis on the general principles of criminal liability. (F)

Property. (4) An introduction to the law of real property, including the topic of adverse possession, possessory estates in land, future interests, marital property, landlord-tenant law, concurrent estates, easements and covenants, and land use planning. (SP)

Torts. (5) The law of civil injuries, including both intentional and unintentional interference with personal and property interests as well as liability without fault. (SP)

An Introduction to the Legal System and Legal Analysis. (2) Credit and grade to be awarded upon completion of the sequence. Instruction in legal research and writing for the fall semester, and a moot court program in the spring. (F)

An Introduction to the Legal System and Legal Analysis. (1) Must be taken on a satisfactory/unsatisfactory basis. Instruction in legal research and writing in the fall semester, and a moot court program in the spring. (SP)

Second and Third Year

Administrative Law. (3) A study of administrative procedure and of agency rules, orders, and discretion (federal and state). Emphasis on the problems that lawyers encounter in practice and their relationship to modern antitrust and regulation. (F,SP)

Constitutional Law. (3) An introduction to the subject covering judicial review and justiciability, federalism, separation of powers and substantive due process. Among topics to be considered are judicial review of legislative and executive actions. (F)

Advanced Topics in Jurisprudence. (3) Nietzsche on law and morality. Nonet

Prerequisites

Alternative Dispute Resolution. (2) This course will first consider various views of the strengths and limitations of litigation as a means of resolving disputes. It will then proceed to an examination, from both theoretical and practical perspectives, of some alternative methods of dispute resolution, including negotiation, mediation and arbitration. The course will give special consideration to the roles that lawyers play in dispute resolution and to the widespread interest in non-litigation alternatives. (SP)

Bundy

American Federalism Seminar. (3) Historical and jurisprudential perspectives on American federalism, with attention to "the original understanding" of 1787, 19th-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 "functionalist critiques of contemporary federalism. Scheiber

American Legal History. (3) Development of the American legal system from the colonial era to the present. Emphasis on topics to be considered are constitutionalism and the common-law tradition, social control through law, federalism in theory and practice, slavery and civil rights, the promotion and control of the economic growth through uses of the law in light of the modern, criminal-justice system, and law in the modern regulatory and welfare state. Scheiber

Ancient Law. (2) Discussion will focus on the ancient Orient (including the Bible) and Greece. It will deal with both what we find and how we find it: by the use of mythology, myths, and narratives as well as legal materials. Sources and form criticism, the nature of comparatism, and other methodological problems will receive attention. May fulfill the writing requirement. Dabbe

Antitrust Law. (3) This course is a one semester introduction to basic antitrust law and economics. Emphasis will be placed upon the economic constraints including monopoly, cartels, oligopolistic interdependence, miscellaneous cooperative activities among competitors, and horizontal mergers. (SP)

Antitrust Seminar. (2) This seminar is open to students who have had or are currently taking a course in antitrust law. The seminar will deal with selected problems in the following areas of antitrust counseling: marketing strategies for the dominant firm; technology access, patent and know-how licensing; trade association activities; pricing, promotion and advertising distribution arrangements; and the development of compliance programs. Sullivan

Scheiber

Appellate Advocacy. (3) Open to second-year students only. The objective of the course is to combine teaching by faculty, experienced practitioners, and judges in the art of written and oral appellate practice, with practical experience in preparing and arguing an argument under the supervision of members of the Moot Court Board and the faculty. Completion of the course is a prerequisite for candidacy for membership on the Moot Court Board. Feller and members of the Moot Court Board.

Bankruptcy. (3) This course centers on the uses and abuses of the bankruptcy process and the social, economic, and political implications of this constitutionally
tracts, the major focus of this course is on commercial law. Students will examine the legal consequences of behavior, analytical structures, and draw inferences from all of the above. Obviously, the course proposes to develop research skills, particularly for advanced graduate students with an outlier interest in insurance.

We will attempt to develop a joint research project, which will enable students to practice their newly found skills. Luker, Skolnick

Bible and Talmud, Law of the. (2) Historical survey and some selected branches. No Hebrew or Aramaic required. Option of exam or paper. May fulfill the writing requirement. Daube

Bilingualism and the Law. (2) This seminar examines the historical treatment of linguistic minorities in the United States as well as some materials on the philosophy of language. The course will then go on to examine the legal implications of such a linguistic environment, and the role it plays in cultural assimilation.

Business, Law and Ethics. (3) A modestly theoretical course, reflecting the view that conventional analytical and institutional frameworks do not provide a substantive basis for professional responsibility for one's conduct in a professional role. Its purpose is to increase sensitivity to the presence of ethical questions, to subject the range of tools available for their resolution, and to encourage an increased use of disciplined ethical thinking in making choices. This course is open also to students in the Graduate School of Business. (SP) Cole

California Marital Property. (2) The study of California law governing the property rights of married couples. The course includes an analysis of the general principles governing the classification of community property and separate property, the management and control of community property, liability of marital property for the debts of the spouses, division of community property on dissolution or death, and the property rights of putative spouses and person living in non-marital cohabitation. (F) Kay

Children and the Law. (2) This course includes, but is not limited to, a discussion of the juvenile court system: delinquent, incorrigible, neglected, or abused children. We also consider rights and responsibilities which flow from the parent-child relationship. Topics include establishing or terminating parent-child relationships, property rights, support obligations, medical consent, divorce custody disputes, and adoption. There is a heavy emphasis on constitutional issues posed by the allocation of power between child, parent, and state. Coore

Chinese Legal System. (2) The seminar will consider both the traditional concepts that underlie the legal system of China and the modern form of legal system in the People's Republic of China. Sessions will be small, with concepts being embodied in Common thought, the Legalist tradition, and the various Dynastic Codes. (F) Berring

Church and State Seminar. (2) Leading U.S. Supreme Court decisions concerning religion. The historical background of the Religion Clauses, the sociology of the basic American religious and tradition, and the leading legal commentary of the issues. Smith

Commercial Transactions. (4) This course in commercial law deals with subjects dealt with in the Uniform Commercial Code in an integrated fashion. On the assumption that all second- and third-year students have a basic introduction to the sales article in Contracts, the major focus of this course is on commercial financing mechanisms and transactions using personal property as security. Also considered are documentary sales involving the use of warehouse receipts, dock warrants and bills of lading, bulk sales, letters of credit, and standby letters of credit. Crawford

Communications Law. (2) Consideration of selected problems of law and policy involving the mass media, particularly but not exclusively the news media. Media control, the relationship between government and the press, and the functioning of today's communications media in the light of the purposes of the First Amendment. (SP) Riesenfeld

Comparative Law. (2 or 3) An introduction to modern civil law based on the codes and case law of France and Germany. The course contrasts the intellectual outlook and techniques of civil and common lawyers by examining a range of problems familiar to both, such as accidents, contract law, consumer protection, inheritance, victims, policing the fairness of contracts, and determining the obligations of contracting parties. Gordon, Riesenfeld

Comparative Law. (2) This course is designed to acquaint students with the basic institutions and policies in other legal systems adhering to continental European traditions, so-called civil law countries. Emphasis is placed on the scope of judicial power, review of legislation as to its constitutionality, protection against abuse of rights and responsibilities of courts, jurisdiction, the right to a fair trial, and the executive branch of the state. Coons

Conflict of Laws. (3) Jurisdiction, choice of law, and recognition of judgments in cases involving inter-state and state-federal conflicts, particularly in the law of procedure, torts, worker's compensation, contracts, property, domestic relations, estates, and business associations.

Constitutional Law II. (4) Constitutional provisions dealing with individual rights including freedoms of expression, association and religion, equal protection, right of privacy and other fundamental rights; constitutional power to enforce individual rights. (F) Post

Constitutional Law IIA. (3) Constitutional provisions dealing with individual rights in regard to equality protection, right of privacy, and other fundamental rights; constitutional power to enforce individual rights. (F, SP) Chopler, Cole, Mishkin

Constitutional Law III. (2) Constitutional provisions dealing with individual rights, including freedoms of expression, association and religion. (SP) Cole

Construction Law Seminar. (2) The seminar will treat legal aspects of the design and construction process. (F) Sweet

Contemporary Legal Theory. (3) The role of philosophical and religious assumptions in debates about law and morality. Specific topics include the role of public education and the relationship between the state and the family. Johnson

Contemporary Problems in International Law. (2) This seminar focuses on a number of current problems in international law and world order, including minorities and terrorism, internal conflict, and economic development. The seminar will discuss the decisions of the International Court of Justice in Nicaragua v. United States and its significance for international adjudication and the use of force. Literature ad-

Criminal Justice System, The. (3) This course has three objectives. It is a study of the attempt to reform legal institutions. It is a sustained analysis of the criminal justice system. And it is an attempt to make students familiar with quantitative approaches to policy analysis. Major topics include the measurement and definition of crime, police power, crime in the criminal justice system. It will explore the basic social science and jurisprudential issues and seek to apply insights to the practical problems confronting California in the 1980s. Zimmerman

Criminal Justice Procedure, (3) A survey of criminal trial and pretrial procedures. Topics include arrest, search and seizure, electronic eavesdropping, interrogation, identification, entrapment, pretrial motions and hearings, plea bargaining, jury trial and double jeopardy. (F)

Criminal Trial Practice. (3) This course is designed for students who are interested in trying criminal cases. The emphasis is on courtroom-type practice, rather than on legal research, although some written work will be required. Some of the areas covered will be voir dire, summation, settlement, interviews, initial conferences, objections to evidence, preliminary hearing, pretrial conference, pretrial motions and trial, including argument and examination of witnesses. Each student will complete, as a part of the examination, at least one witness examination exercise, a preliminary hearing, and a pretrial motion hearing. In addition, each student will conduct a mock trial of a criminal case under the supervision of a professor who will provide written feedback and/or for the mock trials.

Disability Rights. (2) This course will teach disability rights, an emerging area of civil rights law. Both state and federal laws have been enacted in the last decade to ensure equal opportunity for disabled adults and children. These landmark laws subject courts to increasing court activity. The course will explore the substantive areas of employment, housing, education, and access rights, as well as teaching practical skills for lit-
igonating these civil rights cases. The course can also be taken without the clinic. Students who enroll in the clinic will gain practical experience with disability rights litigation.

Domestic Violence Law Seminar. (2) This course will examine the legal system's response to domestic violence. Using an interdisciplinary approach, we will cover historical and psychological materials as well as topics in criminal, family, tort, immigration, welfare, and constitutional law. This course will be taught by the professor and will include material on the allocation of resources in our economy. (F) Rubinfeld

Economics and Public Policy Analysis. (3) This course will provide a broad basic introduction to the fundamental tools of economic analysis. The focal point of discussion will be the principles of microeconomic analysis and the role of the economic institution in society. The emphasis will be on how the various fields will prove useful but is not a prerequisite. Rubin

Economics of Legal Rules and Institutions. (2) This seminar will emphasize the use of economics in the study of law and legal institutions. Initial emphasis will be placed on the economics of the common law, but other topics including the theory of institutions, regulation, and federalism will also be covered. A number of outside speakers will participate on a monthly basis. Students will be required to write a paper in order to satisfy the seminar requirements. The seminar may be taken either or both semesters. Cooter, Rubinfeld

Education Policy and Law. (2) This course analyzes educational policy questions and their legal implications through informal role-playing exercises. Education finance, school funding, school integration, student classification (special education, bilingual education), and school governance (decentralization, vouchers) are some of the topics covered. Sugarmann

EEC Competition Law. (2) A basic introduction to the competition law of the European Community. Some stress will be placed on the aspects which differentiate the Community law from American antitrust law, such as community law emphasis on vertical restraints (aimed at inhibiting barriers between national markets) and Community law emphasis on countervailing behavior by states of firms producing within their borders. Antitrust law is not a prerequisite though familiarity with American antitrust policy will be an advantage. (F) Sullivan

Employment Discrimination Law. (3) Survey of employment discrimination law including substance and procedure of the courts and legislatures prohibiting discrimination on the bases of race, national origin, ancestry, sex, religion, age, physical handicap, and marital status. Includes discussion of disparate impact and disparate treatment theories and application of statistical techniques. Includes constitutional issues and evolving tort and contract series permitting recovery for wrongful discharge. (SP) Vetter

English Legal History, Topics in. (2) A topical introduction to English legal developments, both common law and equity, 1200-1700. Major emphasis is on the growth of legal institutions, the profession, and substantive and adjective law centering on litigation patterns, particularly in real property law. Satisfies the writing requirement. Barnes

Entrepreneurship Law. (3) This course will explore some of the major legal issues in the entertainment industry. It will be organized around the basic transactions in which entertainment lawyers are involved: rights acquisition, financing, production (employment), and distribution. In addition to discussing the transactions themselves, the course will consider the insights that these transactions provide into related areas of legal doctrine, such as contract law, tort law, labor law, antitrust, and intellectual property. This course will be taught by the professor and will include material in all of these fields. Students will be required to write a paper in order to satisfy the seminar requirements. (F) Rubinfeld

Environment and Culture: Protection of Our Heritage. (2) This course will deal with legal means for preserving our biological, cultural, and historic patrimony, focusing on such matters as the Endangered Species Act. Antitrust law, intellectual property law, scenic rivers, parks, wildlife refuges, historic preservation, and other means for protecting cultural artifacts and traditional communities. We will also spend some time reading materials on the theories and philosophy of environmental protection. Sax

Environmental Law. (3) Using economic and administrative law principles developed early in the course, we will study a variety of legal responses to environmental problems. Rather than survey the entire range of environmental law, the course will focus on two particular fields (air and water pollution), examining both traditional regulatory controls and increasingly creative alternatives, such as subsidies, compensation schemes, and transferable property rights in pollution. Dwyer

Estate and Gift Taxation. (1) A basic study of the federal estate and gift taxes through text and code. The course is geared to an uncertain interest in probate practice and estate planning but who recognize the importance of some exposure to the subject. (SP) Halbach

Estate Taxation and Planning. (3) A basic study of the federal estate and gift tax laws, and how they operate on, and effect planning for, gratuities inter vivos and testamentary transfers. (F)

Estates and Trusts. (3) The law of intestate succession and wills; the nature, creation, and termination of trusts; problems of construction; administration of trusts and decedents' estates. (F,SP)

Evidence. (3) Concentration on the fundamental issues of American evidence law with the object of providing students with a general understanding of the following: judicial notice, presumptions, authentication, opinion evidence, and expert testimony. Very limited discussion of cross-examination and impeachment. Harris, Rodriguez, Storz

Family Law. (3) This course examines common law, statutory law, and federal constitutional principles relating to the formation and dissolution of families. Major focus will be on the evolving constitutional law of the family—a remarkable, recent, and pervasive body of doctrine defining state power to regulate intimate relationships. Major topics include regulation of sexual and reproductive behavior, adoption, marriage and marital choice, divorce and its consequences, the doctrine of family privacy, illegitimacy, and child neglect. The course does not cover marital property law. (SP) Harris

Family Law Seminar. (2) The course examines selected problems of divorce and child custody. Emphasis is placed on the emotional problems of divorce and separation, and on the role of the lawyer as a counselor. Enrollment is limited. A paper is required. (SP)

Federal Courts. (4) The jurisdiction and function of federal courts, the distribution of power between the federal and state systems, and the roles of substantive and procedural law in the two systems. (F) Mishkin

Finance and Accounting for Lawyers. (2) This course is designed for students with little or no business background. Topics include assessing tax shelters; accounting and income taxation; investment decisions and analysis; choosing among forms of business organization; financial statement analysis; financial planning; valuation of real property, and common stocks; short-term and long-term financing decisions; dividend policy; leverage; lease financing; capital markets; futures, options, and convertible stock; financial accounting policies in mergers; causes of business failure; international business finance; and legal liability of accountants. (F,SP)

Financial Services Seminar. (3-4) Financial services is one of the most important areas of law firm practice, government regulatory efforts, and consumer concern. This is a year-long reading and research seminar dedicated to these subjects. The seminar will be taught by the professor and will include material in all of these fields. Students will be required to write a paper in order to satisfy the seminar requirements. (F,SP) Emshoff

Future Interests. (1) The course will cover the jurisdiction and function of federal courts, the distribution of power between the federal and state systems, and the roles of substantive and procedural law in the two systems. (SP) Halbach

Health Care Law and Market Policy. (3) The health care industry is now one of the most important areas of our gross national product and is still growing. This course examines the various fields of law that combine (and conflict) to form the overall legal framework for health care decision making. The focus is on the incentives created by the framework and on the various strategies used to structure health care decision making, including professional self-regulation, government regulation, and market discipline (via consumer choice and corporate intermediation as hospitals or insurance companies). The fundamental question the course poses is whether any mix of these strategies can provide a legal framework for the type of decision making that would combine both the knowledge and incentives necessary to make case-by-case micro-decisions concerning when the social costs of health care exceed its social value. Elhauge

Housing Law. (2) This seminar will examine laws, policies, and programs, on a national, state, and local level, that affect housing for the urban poor. Since the majority of the urban poor are renters, we will spend some time on landlord-tenant issues, including the creation of tenancies; affordability, habitability, and security issues in existing tenancies; and issues surrounding the termination of tenancies, including evictions, displacement, and gentrification. The remainder of the class will be devoted to issues concerning the development and availability of affordable housing; access to housing for minorities and other special needs groups; and homelessness. Particular attention will be given to litigation and legislative approaches to housing problems.

Immigration Law. (2) This course considers the combination of special administrative procedure and constitutional law that is called immigration law. (F) Blum

Income Taxation I. (4) A study of statutory, judicial, and administrative material constituting the federal income tax as applicable to the individual. (F)

Income Taxation II. (3) Continuation of the study of federal income tax, with emphasis on the taxation of business enterprises, including partnerships and corporations, and other financial intermediaries. (SP) Barton

Insurance Law. (2) Attention will be focused upon materials which expose the arcane and almost unintelligible language of the insurance policy. Also, it will be important to explore the function of insurance, the carrier and policyholder's responsibilities under the terms of the standardized policies. The approach will be from the perspective of the practitioner asked to review policies, present claims or defend claims. (SP) Sweet

Intellectual Property, Antitrust, and Innovation. (2) This seminar will explore the critical role that technological innovation plays in our economy and the impact of patent law and antitrust law upon innovation, the patent system and patent law, and the relationship of patents and antitrust law. The course will also evaluate current proposals for altering patent law and antitrust. Jorde

International Business Transactions. (2) The seminar will run on an office structure, with weekly or biweekly memora andon narrowly defined specific topics expected of the participants. The focus will be on the attorney for a United States business enterprise with interests abroad, but occasionally with the interest of a host government to foreign investment (particularly in a developing nation) as the client position. Statman

International Development Policy and Law. (2) The seminar will explore the role of development assistance in developing societies, using examples from several countries. To that end the first several sessions of the seminar will examine current economic, political, and social policies, and development concepts, and their present and potential effects of government programs and law. Subsequent sessions, based on student presentations of research undertaken in preparation of course
papers, will explore selected problem areas such as population growth, unemployment and under-employment, rural development and agriculture, urbanization and the environment. Ph.D. Thesis.

International Environmental Law. (2) This seminar addresses the general phenomena of transboundary pollution and the emerging solutions to such problems. Initially, the seminar considers the general international law applicable to such pollution. The seminar then concentrates on a framework for negotiating solutions to transnational pollution problems. This examination will encompass international (state-to-state), transnational, and private solutions. Although not a prerequisite, prior or concurrent exposure to international law is desirable. Caron.

International Law. (3) The basic rules governing the international community, including the rules of customary law as well as the Law of Treaties. Special attention is given to modern developments such as the law of the sea, protection of the environment, and abstention from the use of force. The emerging role of the UN as a principal actor in the lawmaking process.

(F, SP)

Caron.

International Human Rights: Problems of Law and Policy. (2) The problems studied will be based on those set out in the Lilleth-Newman course book, published in 1979. Account will be taken of significant developments since 1979 that include (1) markedly increased human rights violations on a national and international scale; and federal courts, (2) markedly more militant concerns in the United Nations and other transnational forums regarding human rights violations, and (3) the rapid development of policy that characterizes the two decades of the Reagan Administration and in 1990 seen to be endorsed by the Bush Administration. Newman.

International Tax. (2) This introductory course on international taxation will differ from the spring international tax seminar (which uses a program approach and predominantly short student "office" memos of the variety needed in law practice, and in which no exam is given). The fall course may be more conceptual, doctrinal, and theoretical than the spring seminar; as a general matter, students should not take both the class and the seminar. McNulty.

International Tax Seminar. (2) Potentially satisfies the writing requirement. A study of the law of international taxation, the taxation of foreign-source income and foreign persons with domestic-source income. McNulty.

Japanese Legal System. (3) This is an introductory course on the Japanese legal system. It is concerned with the fundamental structure of Japanese law and covers mainly the constitutional law based on legal documents, including translated court cases, historical documents, and prescriptive law, which the participants understand how government-citizen relations are dealt with in various fields. The course will seek to promote understanding of another legal system which stemmed from the continental law and was partially influenced by American law after World War II. Jurисprudence.

(A critique of the main trends of Anglo-American jurisprudence. The use of analogs and models for understanding law. The place of person in an account of law. The relationship of law to the fundamental structure of Japanese law and to sue legal materials for systematic social theory. The scope of medicine's monopoly and the profession's relations with allied health care professions; ownership of and profit from human tissues, organs, and treatment procedures; definition of death and rights to dying; allocations of authority between doctors and patients; problems of policy and authority regarding reproduction; mandatory testing and confidentiality, as well as obligations to treat in a context like AIDS, etc. The course loves to be interested issues of this type, as well as to put a special emphasis on the basis of student interests. The course will require a paper. May potentially satisfy the writing requirement. Shultz.

Legislation. (3) A course in the theory and process of legislative development will include the interaction between formal legislative processes, statutory implementation, representation, and deliberative processes such as the committee and caucus systems, legislative procedures and protocol, electoral structures, and proportional representation and gerrymandering, the appropriations process, lobbying and other interest group activities, statutory implementation, and alternatives to traditional legislative structures. The course will be principally oriented toward those who want a detailed introduction to legislation and the legislative process in the modern administrative state as well as toward those who want to explore, often from an interdisciplinary perspective, important themes in modern public law theory. Rodriguez.

Libel. (3) The course will study the contemporary tort of libel from both a sociological and legal point of view. Subjects include the social function served by the law tort will be analyzed, and the constitutional justifications for the First Amendment restrictions on the tort will be reviewed. Papers. Particularly, especially papers dealing with legal implications of libel associated with the tort, will be encouraged. Post, Skolnick.

Native American Law. (3) Topics for this course will include foundations and sources of federal Indian policy; the federal-tribal relationship; the BIA and entitlements today; tribal sovereignty; criminal jurisdiction in Indian country; rights for mining; Indian lands and tribal lands; allotments and leases; water rights; the Indian Child Welfare Act; and fishery and hunting, Fauvast.

Negotiation. (2) Primarily through small group exercises, the course covers alternative approaches to negotiation and the requisite skills. Participants negotiate against each other based on a prepared set of facts principally in the litigation context. Performance will be reviewed by group discussion, use of videotape and demonstration. Topics addressed include preparation, including case evaluation and client counseling; tactics and countermeasures; communication skills, including nonverbal; concession patterns; competitive vs. cooperative styles; the problem-solving approach; and ethical issues. The course will conclude with a comparison of traditional adversarial negotiation with mediation. Hecht

Partnership Tax. (1) This course is analogous to Income Tax II, but with focus here on businesses operated in partnership rather than corporate form. The subject is of even greater potential significance in practice, to both the tax specialist and the generalist, than the taxation of corporations and their shareholders, yet the former understanding continues to be lacking. Partnership Tax II. Parallel issues receive attention in both courses, providing an opportunity for comparative consideration in this course. Problem-solving occupies most of the class discussion. Barton.

Payments Law. (3) This course combines the basic Uniform Commercial Code and the Negotiable Instruments (Commercial Law II) with a new course on financial institutions. Its goal is to introduce the real issues that arise in modern, large-scale commercial practice and to explore the ramifications of those issues. Particular attention will be devoted to the rapid changes presently occurring in this area, including the deregulation of commercial banking, the development of new financial instruments (e.g., money market accounts, credit cards, automatic teller systems, and transfer orders), and the pending revision of the banking and commercial paper sections of the U.C.C. Commercial Law I is not a prerequisite. Rubin.

Poverty Law Practice. (2) A skills seminar with emphasis on preparing students interested in representing indigent clients in a legal aid, administrative law, or public interest practice. A public benefit caseload will be used to train participants in factual investigation, client communication, brief writing, witness preparation, examination, negotiation, and oral argument. The course will also include readings and discussion on such topics as the history of legal services and ethical considerations. Rosenbaum, Seigman.

Pretrial Litigation Practice: Civil. (2) This course is intended to acquaint students with pretrial litigation practice in typical civil commercial cases. We will cover pleadings; written discovery (including interrogatories, depositions, requests for admissions); preparing for, taking, and defending depositions; making and opposing motions (including preliminary injunctions, demurrers, compelling discovery, and summary judgment); and oral argument. We will also discuss strategies, settlement considerations, client relations, and other topics arising in typical litigation practice. Borton, Marzillii.

Practical Aspects of the Law. (2) Limited enrollment. This seminar is an introduction to the practice of law
Problems of Life and Death Seminar. (2) This seminar is an introduction to practical moral reasoning, focusing on a number of issues relating to life and death that have become highly controversial in legal and public policy debates. The content of the seminar may be gauged from the headings of last year’s syllabus: Moral Reasoning—Limits and Possibilities; Life and the Criminal Law; Some Important Concepts in Moral Reasoning About Life and Death (killing vs. letting die; double effect); Abortion—Assess the Fetuses of the Fetus; Abortion—Conflict of Moral Conscience; Choosing Lives: Killing Some to Save More; Choosing Lives: Should the Numbers Count?; Allocating Life-Sustaining Resources; Suicide and Euthanasia. Kadas.

Professional Responsibility. (2) A study of the legal profession and of the ethical decision-making problems that the lawyer faces. Most class meetings will be conducted by guest lecturers from the banking, title insurance, escrow, and real estate industries, as well as by prominent members of the bar and judiciary.

Public Domain. (2) The law governing management of the federal lands. Among the issues to be considered are the regimes for developing, and the limitations upon exploitation of, resources such as forests, coal, oil and gas, grazing, and miningable minerals. There will also be consideration of the law of land planning for the national forests and the BLM lands and of such issues as fair economic return to the public.

Public Sector Labor and Employment Relations. (2) This course will cover the constitutional and statutory rights of public employees to participate in unions and to engage in collective bargaining with public employers. Among the subjects reviewed are due process procedures, organizing activities, collective bargaining, public employee strikes, union security clauses, and the duty of fair representation.

Quantitative Methods in Law. (4) The primary objective of this course is to train students in the use of multivariate statistical techniques in legal research. A secondary goal is to evaluate, normatively and positively, the manner in which current statistical methods are used in the legal process, and in litigation in particular. Students are expected to have taken a previous course or courses on probability and statistics. Methodological subjects to be covered include experimental design, correlation, simple regression, multiple regression, and an introduction to the legal issues connected with the use of statistical methods in law. It will focus on employment discrimination and antitrust. Practical uses of statistical methods and computer applications will be emphasized. Rubinfeld.

Race and American Law. (2) This course will examine the stereotyping prevalent mostly, not exclusively, Afro-American—before the federal and state legislatures, and courts from the colonial era to the present. Questions of slavery, Jim Crow, peonage, and the modern civil rights movement will be treated in the context of the origins of the first institution to present-day affirmative action efforts. Historical context will be emphasized. Aptheker.

Real Estate Transactions I. (2) This course involves the legal, practical, and commercial aspects of land transfer. It carries the introductory real property course to its logical conclusion in the context of real estate practice. It considers in the land transfer context, matters such as agency, land contracts, options, commercial leases, escrows, execution and delivery, deeds and title, and other obligations and rights, and an introduction to secured real estate financing. Hettle.

Real Estate Transactions II (Secured Transactions). (3) This is a course on security transactions in land. It covers real property security devices (installment land contracts, mortgages, deeds of trust, and personal property security interests) and the problems connected with real estate security, including redemption, subrogation, priority, subordination, judicial and nonjudicial foreclosure, antideficiency provisions, security interests in mixed collateral loans, the transfer of debtors or creditors’ interests, state and federal regulation, and allocation of ultimate loss. Hettle.

Real Property; Real and Personal Property Security; Financial Litigation. (2) This seminar considers—usually in a litigation context—current complex legal issues concerning real property, real and personal property security, finance, and professional responsibility. Most class meetings will be conducted by guest lecturers from the banking, title insurance, escrow, and real estate industries, as well as by prominent members of the bar and judiciary.

Refugee Law. (2) Using an interdisciplinary perspective, this course will examine the causes of refugee flight. We will also examine the existing international norms that address human rights abuses and civil strife. We will look at the responsibility of nations to accept refugees from both an international and domestic law perspective. We will conduct an in-depth study of refugee law as an example of United States, with a particular focus on the assessment of individual claims for asylum or refugee status. The course will also address issues of detention and due process rights of refugees. We will discuss several of the major pending class action cases in this area of law. Blum.

Remedies. (3) The function of awarding remedies, the varying types of remedies that can be awarded and their usefulness, and the extent to which legal rules established by legislatures are increasingly regulatory in nature. The types of remedies will be discussed include money damage awards, including expectation and restitution, and the important equitable remedies such as injunctions and specific performances. (SP)

Roman Law. (2) Introductory course on Roman law. Survey of history and authority, persons, property, obligations, action and cases. Potentially satisfies the writing requirement. Daube.

Securities Regulation. (2) This course concentrates on the regulation of the distribution of securities under the Securities Act of 1933 and under state Blue Sky laws, including the registration under the 1933 Act, practice before the Securities and Exchange Commission, and the underwriting process of certain distributions of securities. (F) Sosinski.

Securities Regulation. (2) This course concentrates on the regulation of trading of securities on stock exchanges and in the over-the-counter market; disclosure obligations in securities transactions; broker-dealer regulation; insider trading under state and federal laws; civil liabilities under state, and federal securities acts, including responsibilities of brokers, dealers, accountants, and other professionals. (SP) Sosinski.

Sex-Based Discrimination. (3) This course deals with the legal issues raised by legal and social discrimination between men and women and explores a range of potential remedies including those drawn from state law, Title VII, the Equal Pay Act, habeas corpus, and common law developments. Subject matter areas include sex-based discrimination in family law, employment law (including Title VII, the Equal Pay Act, and Executive orders), educational opportunity, and criminal law. (SP) Kay.

Sexual Harassment. (2) This course is made up of three components. (1) Students will spend 1½ days per week in a clinical setting, working on sexual harassment cases under the supervision of a private attorney. (2) There will be one-two hour class each week devoted partly to the substantive and procedural law applicable to sexual harassment cases and partly to collective review of legal issues and questions of advocacy and professional ethics raised by students’ clinical work. (3) Students will spend two hours each week providing supervising counseling at a local sexual harassment clinic. Bryant.

Social Welfare Legislation. (3) Social, welfare, and unemployment programs. Current and potential cash transfer programs are examined. Policy analysis, problems of statutory construction, and constitutional law issues are covered. Topics covered include poverty, inequality, and "a right to welfare?, social insurance vs. means-tested programs, program design (eligibility conditions and benefit structures), income transfers and the family (sex stereotyping and the treatment of illegitimate children), work requirements and incentives, comprehensive social insurance, program administration, and reform proposals. Sugarman.

Soviet Law: Comparative Aspects. (2) One focus of the course is the rights and obligations of citizens vis-à-vis the state. Examples of other topics are the status of the U.S.S.R. under international law, the role of law in the economic and political economy, and conflicts of law. Emphasis is placed on the actual operation of the law and on problems it raises for Western lawyers. In an attempt to understand how Soviet law differs from "bourgeois" law, comparisons are also made with the law of other communist-ruled countries. Loeb.

State and Local Government. (3) Power allocation among governmental units: between state and local units, and among local units. Objectives and methods of governmental restructuring are discussed. Limitations to make government responsive to the people. Operational problems: personnel, financing, contract, torts, and resource allocation. Stob.

Technology, Resources, and Law. (3) This course probes the role of science and technology in shaping the legal order and the influence of law in channeling and regulating scientific developments. The course takes an historical approach, beginning with 19th-century policies and doctrines for promoting development, and examining the causes and consequences of laws that cover the land reforms policies of the Populist Era, the regulatory reforms of the Progressive Era, and the rise of the administrative state during the New Deal. Common themes explored through these materials are the interplay between promotion and regulation, the role of scientific expertise in policymaking, and the role the concept of the "public interest" played in developing legal doctrines. The second half of the course explores modern policies evoking a distrust of expertise, the involvement of courts in regulating scientifically based policy decisions, and the role of scientists in making science policy. In exploring these ideas we will look at a number of specific topics, including the impact of pesticides, the development of ocean resources law (both U.S. and international law), and the institutionalization of scientific expertise in policymaking (e.g., the Office of Technology Assessment and the President’s Science Advisor). Dwyer, Scheiber.

Trial Practice. (3) This is a basic course in civil trial practice. It will focus on trial advocacy skills, including factual and legal preparation for trial, trial objections, introduction of demonstrative and real evidence, direct examination, cross examination, examination of expert witnesses, opening statements, closing argument, jury selection, law and motion practice, pretrial conferences, and courtroom communication skills. The heart of the course is student performance on trial problems, which will be videotaped and critiqued. Musante, White.

Unfair Competition. (3) This course deals with a wide range of legal materials that influence competitive behavior. Subject to time constraints, the subjects cov-
War and Other Armed Conflicts: The International and National Legal Controls. (2) Examination of efforts to limit armed conflicts via law and policies. The law of war in treaties, constitutions, statutes, precedents. The roles of supranational bodies (e.g., United Nations, World Court, NATO), of branches of national governments (e.g., Congress, White House, Pentagon) of public and non-governmental organizations are discussed. Newman

Water Law. (3) The course emphasizes Western water law (and will give special attention to California). Some time is devoted to riparian water regimes and the special problems of recreational use of water. In addition to the standard doctrines, the course deals to some length with public projects, public rights in water, area of origin issues, federal and Indian reserved rights, and federal state issues. The central question is why water is different, and what we have to learn from the regime of water law for dealing more generally with public/private conflicts. Sax

Student-Initiated Courses or Projects. Subject to credit limitations in the Academic Rules and the appropriate approvals, second and third-year students may earn credit for student-initiated educational projects as follows:

Editorial Work on Law Journals. (2) For second-year students. Oster

Editorial Work on Law Journals. (4) For third-year students. Oster

Advocacy Programs. (Maximum 6) Includes Moot Court Board, McAiine, Jessup, and other competitions for which credit is given. Oster

Tutorial and Writing Associates. (Maximum 6) Academic Support Program tutors, student instructors in first-year writing program. Oster

Asylum Appeals Clinic. (4) Students will work on political asylum cases dealing with a broad range of critical issues in the area, including the scope of administrative discretion in asylum, the content of the standard of proof in asylum claims, due process and equal protection in the conduct of asylum adjudications in the U.S., to name a few. Students will be responsible for writing opening and reply briefs or amicus briefs at the Board of Immigration Appeals and/or the United States Courts of Appeals. Botelho

Disability Rights Clinic. (2-4) Students who enroll in this course will be expected to commit 8-16 hours per week of clinical time working at Disability Rights Education and Defense Fund (DREDF), the nation's leading public interest law firm defending the civil rights of disabled persons. The students will be exposed to all areas of disability civil rights practice, including litigation, administrative hearings, public policy, and networking activities. Litigation involves access rights, as well as discrimination in education, employment, and housing. Mayerson

Immigration Law Clinic. (3-10) This course consists of two components—field placement in an immigration legal setting and a weekly case supervision session. Each student works a minimum of 12 hours per week in a field placement and at least 8 hours per week of clinical time working at Disability Rights Education and Defense Fund (DREDF), a non-profit organization that is the nation's leading public interest law firm defending the civil rights of disabled persons. Students work in teams and will be expected to commit 8-16 hours per week of clinical time working at Disability Rights Education and Defense Fund (DREDF), the nation's leading public interest law firm defending the civil rights of disabled persons. Students will be expected to commit 8-16 hours per week of clinical time working at Disability Rights Education and Defense Fund (DREDF), the nation's leading public interest law firm defending the civil rights of disabled persons.

Emphasis will be given to the ethical and moral tensions that lawyers face. The clinical placements provide an opportunity for students to practice, observe, and comment on the role of the lawyer. Heath

Sexual Harassment Clinic. (4) In combination with Sexual Harassment, this course is made up of three components: (1) Students will spend two days per week in a clinical setting, working on sexual harassment cases under the supervision of a practicing attorney. (2) There will be one two-hour class each week devoted partly to the substantive and procedural law applicable to sexual harassment cases and partly to collective review of legal issues and questions of advocacy and professional ethics raised by students' clinical work. (3) Students will spend several evenings through the semester providing supervising counseling at a local sexual harassment clinic. Bryant

Street Law. (3) The Street Law Project operates in conjunction with approximately 40 Bay Area high schools and their respective school districts. Law students, working under faculty supervision, serve as student instructors and teach a course entitled Street Law, which annually reaches 3,000 high school seniors. The program seeks to promote legal literacy among young people to ensure that they possess that minimum amount of practical, legal knowledge needed to understand the system as a whole and how it can work in their behalf. Law student instructors make presentations in housing, consumer, family, criminal, and constitutional law at the high school sites. They also participate in weekly seminars and research and develop additional materials to be used in the classes. Nazario

Practitioner-Supervised Clinical. (2-4) Students work 8-16 hours per week in 15 weeks in law offices under the supervision of an experienced attorney. Schiff

Berkeley Community Law Center. (4) The Berkeley Community Law Center offers students an opportunity to work in a clinical setting providing free legal services to residents of Oakland and Berkeley. Schiff

Practitioner-Supervised Clinical. (5-10) Students work 20-40 hours per week for 15 weeks in law offices under the supervision of an experienced attorney. Schiff

Judicial Externships. (2-10) Students work 20-40 hours per week for 15 weeks for a state or federal court judge. Schiff

Legal Dissertation. (8-13) Open to third-year students who have completed a qualifying seminar in the second year. Research and writing looking toward a major piece of legal scholarship under the direction of an individual faculty member pursuant to faculty consent. (F,SP) Oster

Group Research Project. (1-2) Open to students who have completed the first-year curriculum. A program to enable groups of students to study or research special legal topics of common interests, primarily in subject matter not covered by the regular curriculum. Requires the consent of a member of the faculty to serve as supervisor and the approval of the assistant dean of students. (F,SP) Oster

Independent Research Projects. (1-12) Open to students who have completed the first-year curriculum. A program to enable individual study and research in depth of special topics of the law. Supervision of a member of the faculty with a goal of producing an original paper or report. Requires the consent of a member of the faculty to serve as supervisor and the approval of the assistant dean of students. (F,SP) Oster

Individual Study, JSP Masters. (1-12) Must be taken on a satisfactory/unsatisfactory basis. (F,SP)

Individual Study, JSP Doctorate. (1-12) Must be taken on a satisfactory/unsatisfactory basis. (F,SP)

Professional Courses

Professional Training: Supervised Teaching. (4) Must be taken on a satisfactory/unsatisfactory basis. (F,SP)
main issues may be either legal studies courses or courses from an approved list of law-related courses offered outside the program.

The rationale for the structure of the legal studies curriculum becomes apparent if a few words are said about the content of the courses I have discussed above. The Group A requirement insures that all students are exposed to conceptual analysis and broad intellectual perspectives. Group B courses are meant to familiarize students with 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 insures 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 advisor, a student majoring in legal studies with an overall GPA of 3.3 and a GPA of 3.5 in legal studies courses, may enroll in 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 group major in legal studies may be obtained from the program office.

Only some of the following listed courses are offered in a typical year. The Schedule of Classes should be consulted for up-to-date information on course offerings.

Upper Division Courses

100A-100B. Foundations of Law: The Quest for Justice. (4,3) Three hours of lecture and 1 hour of discussion per week. Prerequisites: 100A is a prerequisite to 100B. Introduction to law for the liberal arts student. The purpose is to familiarize students with major legal ideas, legal reasoning, and legal processes; to provide a comparative and historical perspective on law; and to highlight basic philosophical problems in the quest for justice. (F,SP)

101. Legal Theory. (4) Three hours of lecture and one hour of discussion per week. This course examines the issues and assumptions underlying the legal framework of society and includes the theory and practice of judging, the nature of law and morality. (F,SP)

103. Theories of Law and Society. (4) Three hours of lecture and one hour of discussion per week. An historical examination of major interpretations 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. (F,SP)

107. Theories of Justice. (3) Three hours of lecture and 1 hour of discussion per week. Major perspectives in social and economic thought, e.g., natural law, natural right, laissez faire, "possessive individualism," contractualism, pluralism, and social equality as they affect contemporary discussion of "higher law," fairness, civic competence, and distributive justice. (F,SP)

108. Topics in Philosophy and Law. (3) Two hours of lecture and one hour of discussion per week. The course is designed to deal with current legal issues on which philosophical techniques and arguments bear. (F,SP)

109. Aims and Limitations of the Criminal Law. (3) Three hours of lecture and 1 hour of discussion per week. Analysis of the capacity of criminal law to fulfill its aims. What are the aims of criminal law? How are they assigned relative priority? What principles can be identified for evaluating the effort to control disapproved activities through criminal law?

110. Legal and Political Obligation. (4) Three hours of lecture and one hour of discussion per week. The course will focus on the perennial question of political obligation: why should I obey the law? We will examine what claims the law makes on us as citizens, and the morality of various ways of responding to those claims. We will discuss ideas about civil disobedience and civil obedience and we will examine theories of political obligation based on consent, fairness, democracy and justice. (F,SP)

111. The Making of Modern Constitutionalism. (4) Three hours of lecture and one hour of discussion per week. Historical examination of the emergence of "constitutionalism" as a concept and supporting doctrines for the daily setting of legal mechanisms in modern society. (F,SP)

112. Historical Introduction to the Philosophy of Law. (4) Three hours of lecture and one hour of discussion per week. The purpose of this course is twofold: first, to survey some of the most important theories of law developed since antiquity through the 20th century; second, to discuss the importance of a philosophical and conceptual framework for the daily setting of legal mechanisms. (F,SP)

120. Property and Liberty. (3) Two hours of lecture and one hour of discussion per week. Topics include ways in which "property" may be defined; manner in which law regulates and protects property interests; arrangements for the allocation of wealth and the distribution of public property. Readings include legal cases and essays by philosophers, economists, etc. (F,SP)

121. Law and Bureaucratic Organizations. (3) Two hours of lecture and one hour of discussion per week. Legal theory usually only individual actors and does not recognize organizational giants like, 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 behavior, ethical questions. (F,SP)

145. Law and Economics I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Together Law & Econ I and II provide comprehensive introduction to economic analysis of law. Course need not be taken in numerical order; nor is one a prerequisite to the other. The course will apply microeconomic theory analysis to legal rules and procedures. Emphasis will be given to the economic consequences of various sorts of liability rules, remedies for breach of contract and the allocation of property rights. The jurisprudential significance of the analysis will be discussed. (F,SP)

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 number of moral and political mechanisms which has prompted substantial reforms in recent years, e.g., deregulation in transportation. The course examines this critique. (F,SP)

148. The Politics of the American Legal System. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Upper division standing. A study of the American legal system, from both behavioral and normative perspectives. Topics covered include: the nature of judicial decision making, the nature of judicial review, the systems of the federal and state courts, with other political institutions, law as symbol. (F,SP)

149. Lawmaking. (3) Two hours of lecture and one hour of discussion. This course traces the law-making process from the generation of ideas for new laws and the entry of individuals and groups into politics to push such measures through legislative bodies and in the courts. Armed with normative perspectives, the course will then examine closely a number of legal/social conflicts, including sterilization, abortion and contraception. (F,SP)

150. Legal and Moral Responsibility. (3) Two hours of lecture and one hour of discussion per week. Analysis of the conditions of moral and legal responsibility. Discussion of the concepts of cause, blame, guilt, punishment, fault, liability. Topics to be examined: role of excuses in a theory of responsibility; justification for holding one person responsible for the actions of others. (F,SP)

153. Seminar on Social Science in Law. (4) One 3 hour seminar and 1 conference hour per week. Prerequisites: Consent of Instructor. Enrollment is limited. In this seminar we shall examine actual and potential uses of "social science" research in the legal process. Topics will include: origins of social science in law; the application of social science methods to such legal and policy issues as race and sex discrimination in education and employment; obscenity; parole and sentencing prediction; eyewitness testimony; insanity and diminished capacity; lie-detection; the exclusionary rule; criminal sanctions; and court reform. (F,SP)

155. Government of the Family. (3) Three hours of lecture and one hour of discussion per week. This course examines state 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 and the consequences of divorce and child custody decisions. (F,SP)

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 changes, colonial period to the present. (2) Speculation about 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. This course examines concepts that form the basis of the Chinese legal system, traditional theories and institutions of pre-1911 society, and the expression and rejection of the traditional concepts in the laws of the Nationalist period and the People's Republic. (F,SP)

162. Courts and Social Policy. (4) Three hours of lecture and one hour of discussion per week. The course examines major Supreme Court cases; it examines state regulation of conventional family formation and dissolution and focuses on selected topics in child welfare law. Topics include: the state's role in reproductive decisions, entry into marriage, divorce and the consequences of divorce and child custody decisions. (F,SP)

163. Juvenile Delinquency and Juvenile Justice. (4) Three hours of lecture and one hour of discussion per week. This course examines the premises, doctrine, and operational behavior of juvenile courts, particularly in relation to the commission of seriously anti-social acts by minority adolescents. Topics include: the history of theories of delinquency; the jurisprudence of delinquency; the incidence and severity of delinquency; police response to juvenile offenders; the processes of juvenile courts and youth corrections; and reforms or alternatives to the juvenile courts. (F,SP)

165. Liberal and Privacy. (4) Three hours of lecture and one hour of discussion per week. This course examines the relationship between the liberal and the criminal law. The course examines the major Supreme Court cases on privacy and the criminal law. (F,SP)

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 sex and reproductive and contraceptive practices. It 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 normative perspectives, the course will then examine closely a number of legal/social conflicts, including sterilization, abortion and contraception. (F,SP)
170. Crime and Criminal Justice. (4) Three hours of lecture and 1 hour of discussion per week. Introduction to the etiology of crime and criminal justice administration. What is crime? What are the main features, causes, 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)

174. From Bracton to Brandeis. (3) Two hours of lecture and one hour of discussion per week. This course will examine Anglo-American legal history in terms of the lives and judicial opinions of ten leading English and American judges—Bracton, Bacon, Coke, Mansfield, Blackstone, Marshall, Story, Holmes, Cardozo, and Brandeis. (F,SP)

177. American Legal and Constitutional History. (4) Formerly 178. Three hours of lecture and one hour of discussion per week. History of American law and the constitutional system. Topics include: colonial heritage, foundations of American federalism, role of the law in the imposition of social control, and regulation of economic interests, styles of judicial reasoning and the common-law tradition. (F,SP)

178. Seminar On American Legal and Constitutional History. (3) One 2-hour meeting 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 to students who have taken 177. (F,SP)

179. Comparative Constitutional Law. (3) Three hours of lecture per week. An examination of constitutional decision-making in a number of countries based on selected high court opinions. (F,SP)

181. Mental Health Issues and the Law. (3) One 2-hour lecture and 1-hour discussion per week. Major issues in the interface of law and mental health. Application of the behavioral sciences to criminal and civil law. Legal regulation of mental health practice. (F,SP)

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 and current major functional areas 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 consider alternative perspectives on social control and social change. (F,SP)

183. Law and the Evolution of the State. (4) Three hours of lecture and 1 hour of discussion. The course is an historical examination of the genesis of the State as a legal institution. It will focus on the formation of legal institutions in general, with particular emphasis on the medieval and its subsequent rationalization as a system of government in modern society. It will also examine how and why the birth of Jurisprudence in Western culture has contributed to the radical transformation of a traditional political system into an abstract and therefore quasi-absolute form of power. (F,SP)

184. Health Care Law and Market Policy. (4) Three hours of lecture and one hour of discussion. Prerequisites: Microeconomics, and open to upper division only. This course examines the legal framework of health care and the strategies used to structure health care decision making, including professional self-regulation, government regulation, market discipline. Topics include the economics of the health care market, quality assurance, the social costs versus the social values of health care. (F,SP)

185. Church, State, and the Law. (3) Two hours of lecture and one hour of discussion per week. An examination of Church-State relationships. One-third of the course will be historical, based on texts taken from critical cases of Church-State interaction. Two-thirds will be devoted to problems current in the United States from 1946 to the present. (F,SP)

190. Seminar on Topics in Law and Society. (4) Consent of instructor. Advanced study in law and society with specific topics to be announced. (F,SP)

Library and Information Studies
(School of Library and Information Studies)

H195A-H195B. Honors in Legal Studies. (4) To be arranged. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Senior standing, acceptance into Honors Program in Legal Studies. Study of an advanced topic under the supervision of a faculty member leading to the preparation of a senior honors thesis. One or two semesters at the instructor's option. (F,SP)

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a pass/no pass basis. Prerequisites: Upper division standing. Consent of instructor and approval of Program Chairman. Enrollment is restricted. Consultant the Legal Studies office for more information. (F,SP)

Upper Division Courses

128. Survey of Children's Literature. (3) Two 1½-hours of lecture per week. Formerly Bibliog 128. Children's literature as a genre of literature. Its role in the lives of children. Historical perspective milestones and the current scene in publications. A syllabus of books read by children will be included. (F)

141. Information Access and Retrieval: Problems and Prospectives. (3) Two 1½-hours of lecture per week. Formerly Bibliog 141. Key problems of information retrieval. Intended as introduction for students having engineering, science, or professional school backgrounds. Includes: design principles for document and data retrieval; binary, weighted, and statistical indexing techniques; retrieval evaluation; relevance, abstractness; utility; indexing, vocabulary control. (SP) Staff

Graduate Courses

200. Introduction to Information Service. (3) Three 1-hour or two 1½-hour lecture/discussions per week. Prerequisites: 210 must be taken concurrently and consent of instructor required. 200 and 210 required of all beginning M.L.I.S. students in their first semester. Search strategy for finding information; selection and evaluation of information sources; trade, national, subject bibliography; general and specialized reference works; use of online information sources. (F) Staff

205. Principles of Information Retrieval. (3) Three hours of lecture per week. Consent of instructor. Topics include: automatic indexing; clustering techniques; measurement of retrieval effectiveness; retrieval experimentation methodology; introduction to question-answering systems. (SP) Staff

206. Advanced Topics in Information Retrieval. (3) Three hours of lecture per week. Prerequisites: 205 or consent of instructor. Topics include: retrieval systems with emphasis on techniques that can be implemented on a computer. Types of retrieval systems; automatic indexing; clustering techniques; measurement of retrieval effectiveness; retrieval experimentation methodology; introduction to question-answering systems. (F)

207. Expert Information Systems. (2) Two hours of lecture per week. Prerequisites: 205 or consent of instructor. Focus on creation of "expert" systems which supply information responses to user queries. Aspects of logic, linguistics and cognitive science which bear on the design of knowledge-based literature search. (F)

210. Introduction to Organization of Materials. (3) Three hours of lecture per week. Prerequisites: 200 must be taken concurrently and consent of instructor required. 200 and 210 required of all beginning M.L.I.S. students in their first semester. SU option not allowed. Formerly Linstot 211. Access to information through bibliographic organization, description, and subject analysis; includes use of descriptive codes, standard subject heading and classification schemes, and MARC formats for monographs and serials. (F) Staff

211. Catalogs and Cataloging. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 210. Formerly Linstot 210. Methods and principles of organization, access, and retrieval of monographic, serial, and nonbook records; use of AACR2 and other standards; evaluation and practice. (SP) Staff

211P. Practicum in Organization of Materials. (1) Sixty hours of supervised on-site activity plus bi-weekly meetings to be arranged. Prerequisites: 211 and consent of instructor; M.L.I.S. students only. (F)

217. Analytical and Descriptive Bibliography. (2) Two 1-hour lectures per week. Prerequisites: 280 or consent of instructor. An advanced, analytical bibliography as a method of investigation of the book as a physical object. The method of descriptive bibliography based upon Bowens. A critical survey of the state of analytical and descriptive bibliography. (SP) Harlan

*On leave, spring
Recalled to active service
Recipient of Distinguished Teaching Award
220. Systems Analysis in Information Services. (3) Formerly 230. Two 1/2-hour lectures per week. The systems approach to decision making and policy analysis in libraries and information centers. The role of the systems analyst in library and information center management. (SP) Braunstein

225. Catalog Design. (3) Three hours of lecture per week. Prerequisites: 200, 210, or consent of instructor. Focus on subject access options for bibliographic re-trieval systems and thesaurus construction, design of special-purpose re-trieval systems through stage of specification writing. (SP) Larson

226. Introduction to Archival Administration. (3) Three hours of lecture per week. Principles and practice of archives management. Major components including relevant aspects of current records manage ment. Focus on archival methods for preservation, organization, and use of historical and administrative records in textual, visual, audible, or machine-readable form. (F)

227. Information and Records Management Practice. (2) Two hours of lecture per week. The various components of professionally managed records and information systems, including records inventory and disposition techniques, vital records control, forms management, and inter-agency systems, micrographics and storage, reports management, personal privacy protection, and rights of public access to information. (SP)

228. Office Information Systems. (3) Two 1/2-hour lectures per week. Prerequisites: 271, Business Administration 248 or equivalent or consent of instructor. Information systems frameworks. Technological and organizational issues related to office automation, document-based information systems and end-user computing. Implementation strategies. (SP) Ober

229. Computer Manipulation of Bibliographic Data. (3) Two 1/2-hour lectures per week. Prerequisites: 235, 220 recommended but not required. Development of computer programs for manipulation of bibliographic records using the MARC monograph and serials formats. Computer control techniques for bibliographic data. (SP) M. Cooper

232. Design and Implementation of Information Systems. (4) Six hours of lectures per week. Prerequisites: 235, 239. Class jointly develops functional specifications and design for an automated library subsystem, one of cataloging. Class then writes and tests computer programs to implement system they design. (F) M. Cooper

236. Use of Data Base Management Systems. (3) Formerly 278. Two 1/2-hour lectures per week. Prerequisites: 230, 235, or equivalent, or consent of instructor. Analysis of computer programs (DBMS) for the organization, maintenance, and access to information. Discussion of relational, hierarchical, and network data models. Design and implementation of a database on a commercial DBMS. Selection and evaluation of DBMS. (FSR, FSP) Larson, Ober

239. Implementation of Database Management System Applications. (3) Three hours of lecture per week. Prerequisites: Introductory computer programming course such as 235 or equivalent; 238. Advanced group design and implementation of a bibliographic or administrative application using a database management system. (F)

244. Information in Society. (3) Two 1/2 hour class meetings per week. Information in its social context. The place of library and information centers in infor mation age society. Social and individual needs and demands. Application of behavioral and social sciences to study and evaluation of information services. (F) Braunstein

250. Bibliography and Information Service. (3) Two 1/2-hour lectures and one hour of discussion per week. Prerequisites: 220. Exploration of bibliographical or information service activities. Development and use of online sources of bibliographic and nonbibliographic data. Information analysis, evaluation, and synthesis. Studies of literature use, information service problems and policies. (SP) Duggan

250P. Practicum in Information Services. (1) One hour meeting every other week, plus 20 hours of on-site activity. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor; 220; 250 must be taken concurrently. Sixty hours per semester of applied, on-site activity in an agency providing reference service, plus bi-weekly meetings to be arranged. Intended for students without significant experience in reference work. (SP) Cooke

251. Bibliography and Information Service: Health Sciences. (2) Formerly 251D. Four hours of lecture seven days per week or two hours of lecture per week for fifteen weeks. Prerequisites: 200. Search strategies, selection, and evaluation of information sources in health sciences.

252. Bibliography and Information Service: Law. (2) Formerly 251F. Four hours of lecture for seven and one half weeks or two hours of lecture per week for fifteen weeks. Prerequisites: 200. Search strategies, selection, and evaluation of information sources in law. (SP)

260. Management of Libraries and Information Services. (3) Three hours of lecture per week. Prerequisites: 200, 210 or consent of instructor. Introduction to management issues in libraries of all types and other information organizations. Must be taken for letter grade if taken to meet the requirements for the M.L.I.S. degree. (F) Weedman

261. Information Services in Organizations. (3) Three hour of lectures per week. General introduction to the provision of specialized library services and other information management activities in both private and public sectors: governmental agencies, non-profit organizations, and private corporations. Mission, problems, opportunities. Management functions as applicable: planning, organizing, staffing, budgeting, controlling. Must be taken for letter grade to meet the requirements of the M.L.I.S. degree. (SP) Weedman

262. Public Libraries. (3) Three hours of lecture per week. General introduction to public libraries: functions, services and their relationship to the community. Management skills and public library administration, organizing, staffing, budgeting, controlling. Must be taken for letter grade if taken to meet the requirements for the M.L.I.S. degree. (SP)

263. College and University Libraries. (3) Three hours of lecture per week. General introduction to the organization and administration of college and university libraries and their place in the institutions they serve. Problems and practices with respect to governance, functions, collections, and building. Management functions as applicable: planning, organizing, staffing, budgeting, controlling. Must be taken for letter grade if taken to meet the requirements for the M.L.I.S. degree. (SP)

264. Work with Children and Young Adults in School and Public Libraries. (3) Three hours of lec ture per week. Development of the professional skills of implementation, management, and evaluation of multi-media library programs in school and public libraries: Reading interests, types of materials, levels of reading ability, library skills, instructional design. Must be taken for letter grade if taken to meet the requirements for the M.L.I.S. degree. (SP) Weedman

264P. School Library Media Center Practicum. (2,4) Six or twelve hours of practicum and consultation per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 200, 210, 264, 265, of which 264 may be taken concurrently; consent of instructor; open only to those holding or eligible for a standard teaching credential or its equivalent. Students work required for the California Library Media Teaching Credential. Placement required in both elementary and secondary schools. May be done in two semesters at 2 units each semester or in one semester at 4 units. (F,SP) Weedman

265. Children's Literature. (3) Formerly 265A. Two 1/2-hour lectures per week. Historical backgrounds and development; twentieth-century trends; criticism and evaluation; trends in use of illustration. (F) Weedman

266. Oral Interpretation of Imaginative Literature. (1) Formerly 265B. One-hour lecture per week. Prerequisites: 265 or consent of instructor. Historical development and critical analysis of folklore, legends, myths, and modern imaginative literature: Their role in library programs. (SP)

267. Non-Print Media in Libraries. (3) Three hours of lecture per week. Problems relating to the handling and use of non-print media. The role of the librarian in a modern media center, evaluation of materials, the use of media in education, information and entertainment, and some aspects of media technology. (F)

271. Management of Information Technology. (2) One 2-hour lecture per week. Prerequisites: 230 or 235 (may be taken concurrently) or consent of instructor. Implementation and management of computerized systems in libraries and information centers: planning, selection, procurement, staffing, supervision, costing, evaluation. Concepts of hardware, operating systems, programming languages, database management systems, telecommunications, communications, and networks. Technological trends. (F) Ober

272. Measurement and Evaluation of Library and Information Services. (3) Three hours of lecture per week. Prerequisites: Any of 220, 261, 262, 263, 264, or consent of instructor. An introduction to the measurement and evaluation of libraries and other services and systems. Topics include introduction to evaluation research; measurement of organizational performance; evaluation performance of libraries, library subsystems (e.g., reference, cataloging) and other information systems; and cost, cost-effectiveness, and cost benefit analysis. (SP)

274. Economics of Information. (3) Three hours of lecture per week. Prerequisites: Course in economics or consent of instructor. The measurement and analysis of the role information plays in the economy of the resources devoted to the production and distribution of information. Topics include the functioning of information markets and the reasons for market failures. (F) Weedman

276. Collection Development. (2) One 2-hour lec ture per week. Prerequisites: 200. General principles and procedures relative to selection of materials: assessment of user needs, resource allocation, selection methodology, budgetary controls, acquisitions policy, review bibliography, ethical issues, special applications to different kinds of libraries. (F) Braunstein

280. Development of the Book. (3) Three 1-hour lec tures and one 1-hour laboratory per week. A survey of the development of the book from the beginning of writing to today's computerized production methods. Emphasis placed on all aspect of the printed book. (F)

282A. History of Printing and Publishing: Origins to 1700. (3) Two 1/2-hour lectures per week. Prerequisites: 280. Historical, social, and technological study of the invention and spread of printing in the West. Emphasis is placed on the influence of the book trade during the seventeenth century. (SP) Duggan

282B. History of Printing and Publishing: 1700 to Present. (3) Two 1/2-hour lectures per week. Prerequisites: 280. The history of printing, publishing, and the book trade during the transitional and modern pe riods of printing. (SP)

283. Contemporary Publishing. (2) Two 1-hour lec ture per week. Survey of the publishing industry and the processes of publication; contemporary trends and problems. (F)

285. Special Topics in Library and Information Studies. (1-5) May be repeated for credit with change in topic. May be taken concurrently with one to three hours of lecture per week for 15 weeks. Prerequisites: Consent of Instructor. Specific topics,
hours, and credit may vary from section to section, year to year. (F,SP) Staff

*295. Quantitative Social Science Research Methods in Library and Information. (3) One 3-hour lecture per week. The application of quantitative social science research methods to library and information studies. Includes: research design; conceptualization, operationalization, and measurement; sampling; experimental design; data collection, including survey research and data analysis. Intended primarily for doctoral students.

296A-296B. Seminar. (2-4) May be repeated for credit, with change in content. Two to four hours of seminar per week. Topics in bibliography, information sciences, administration of libraries and information systems, education and training, comparative librarianship, library education, and related fields. Specific topics vary from year to year. (F,SP) Staff

297. Field Study in Library and Information Studies. (2-4) Regular consultation with faculty supervisor. Prerequisites: Consent of instructor. Individual or group study of specific problems in library and information studies in the field. Individual and group meetings with instructor reported. Requires (F,SP) Notan

298. Directed Group Study. (1-3) Course may be repeated for credit. One to three hours of meeting per week. Group study of specific problems in library and information studies under faculty direction. Group meetings with instructor reported. Requires (F,SP) Staff

299. Individual Study. (1-12) May be repeated for credit. Varies. Individual study of topics in library and information studies under faculty supervision. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-5) May not be used for unit or residence requirements for the doctoral degree. May be repeated for credit. 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. and D.L.I.S. degrees. (F,SP) Staff

Professional Courses

310. Teaching Assistance Practicum. (1-6) Course may be repeated with change in content. Four hours of work per week per unit including class time. Must be taken on a satisfactory/unsatisfactory basis. Discussion, reading, preparation, and practical experience under faculty supervision, in the problems and opportunities of teaching specific topics in library and information studies. 310 will give credit on the student's transcript for learning experience under faculty supervision. This would not count toward a degree. (F,SP) Staff

410. Research Skills Practicum. (1-6) Course may be repeated for credit. Four hours of work per week per unit including class time. Must be taken on a satisfactory/unsatisfactory basis. Individual research work under supervision of a faculty member. 410 will give credit on the student's transcript for learning experience even though this would not count toward a degree. (F,SP) Staff

Related Courses in the Program in Public and Nonprofit Management

IDS 206. Advanced Seminar in Public and Nonprofit Management. (3)

IDS 207. Managers and Management. (3)

IDS 208. Techniques of Management Control. (3)

IDS 209. Applied Microeconomics. (3)

IDS 210. Organizational Understanding for Managers. (3)

IDS 211. Public Sector Accounting. (3)

IDS 212. Financial Management. (3)

IDS 214. Strategic Management in the Public Sector. (3)

Because the major varies greatly from student to student, each student is encouraged to plan a program of study with an undergraduate adviser and to advise the student on a regular basis (at least once a semester).

Linguistics majors who have completed the core courses are encouraged to enroll in linguistics graduate courses whose prerequisites they satisfy.

Honors Program. With the approval of the major adviser, a student with a grade-point average of 3.3 or higher, both overall and in the major, may apply for admission to the honors program. This consists of two or more units of Linguistics H195 units per semester for at least two semesters. Under the direction of a faculty member, students carry out an approved program of independent study in which they attain a reasonable mastery of an appropriate linguistic topic. As evidence of each semester's work, they must submit an acceptable term paper summarizing critically the material they have covered.

Graduate Programs

Preparation for Graduate Study in Linguistics. Graduate students in linguistics should have had and hold the equivalent of an undergraduate major in the field: anthropology, mathematics, computer science, philosophy, rhetoric, English literature, or some equivalent acceptable to the department. They should be prepared to pass the required foreign language reading examinations early in their graduate career.

Master's Degree in Linguistics. Students may follow either Plan I or Plan II for the master's degree. Plan I requires 25 units plus a thesis. (No course units are granted for the thesis itself.)

Plan II requires 30 units. Both plans include their culmination, normally at the end of the second year, a three-hour comprehensive examination. Required courses for the linguistics M.A. are 110, 115, 120A, 120B, 121, 125, one course from the set [105, 123, 181], one course from the set [121, 125], one course from the set [210, 211, 215], and one course from the set [205, 220]. Students are encouraged to supplement the core courses with a coherent battery of courses in a particular language or language family, in general linguistics, or in some allied field such as cognitive science, archeology, or literature. These supplemental courses are to be chosen in consultation with the student's adviser.

Doctoral Degree in Linguistics. The program follows Plan B, as described in the doctoral degree section (see Index) with some augmentations. Information regarding further requirements is obtainable from the department office.

Summer Linguistic Institute. The principal scholarly organization representing the field of linguistics in this country, the Linguistic Society of America (1325 18th Street N.W., Suite 211, Washington, D.C. 20006-6501, telephone (202) 835-1714), sponsors a six- or eight-week biannual summer program in linguistics, in collaboration with some co-sponsoring university. Students in linguistics, at both the graduate and undergraduate level, are strongly encouraged to take part in such linguistic institutes. These programs offer a wide range of courses, seminars, conferences, workshops, and lecture series, covering developments in the field and areas of interest which no single university can offer.

Lower Division Courses

1A-1B. Elementary Swahili. (4) Four 1-hour recitation sessions and one 1-hour laboratory per week. (F,SP)

2A-2B. Elementary Language Tutorial. (3) Course may be repeated for credit. To be arranged. Prerequisites: Requires special permission. Apply to Linguistics office. Specially designed tutorial for individuals or small groups needing instruction in an African
100. Introduction to Linguistic Science. (4) Three 1-hour lectures and one 1-hour discussion per week. An introduction to the scientific study of language. (F,SP)

5W. Linguistics Writing Workshop. (2) Two 1-hour workshops per week. A 2-unit writing workshop which must be taken with Linguistics 5. Satisfies the second half of the Reading and Composition requirement. Two additional 1-hour meetings with a composition tutor. 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. Intermediate Swahili. (3) Three 1-hour classes and 1-hour laboratory per week. Prerequisites: 1B or equivalent. This course includes review and development of grammatical concepts taught in first year Swahili as well as further practice in speaking and writing. (F)

10B. Intermediate Swahili. (3) Three 1-hour classes and 1-hour laboratory per week. Prerequisites: 10A or equivalent. Continuation of 10A. Emphasis on listening comprehension, pronunciation accuracy and speaking fluency by means of oral expression practice. (SP)

11. Writing Systems. (3) Two 1½-hour meetings per week. Examines different writing systems in terms of their historical origin and their cognitive properties. Enrollment limited to 15 students. (SP)

16. The English Vocabulary. (3) Three 1-hour lectures per week. The sources and the resources of the English lexicon. The structures, meanings, etymological principles, and pronunciation of complex words in English. Native and non-native word-formational processes. The development of technical terminologies. Etymology and semantic change. (F,SP)

51. The Politics of Language. (3) Three 1-hour lectures per week. The political uses of language. Diacritics, prestige forms, bureaucratic, male and female language, politeness and correctness, language planning, bilingualism, language attitudes. Enrollment limited to fifteen students. (SP)

55. The American Languages. (3) Three 1-hour lectures and one 1-hour laboratory per week. A linguistic view of the history, society and culture of the United States. The presence and influence of the Indian languages and the influences of the Indian languages on English. (F,SP)

71. Development of the Chinese Language. (3) Three 1-hour lectures per week. This course will cover the Chinese language from a historical viewpoint, with reference to its early development and present diversity. Special attention will be devoted to some of its more remarkable features, such as the tones and the writing system. Knowledge of Chinese useful but not required. (F)

75. American Indian Languages. (3) Two 1½-hour lectures per week. Introduction to the native languages of the Americas. (F,SP)

90A-90B. Lower Division Seminar. (2,2) May be repeated for credit. One 2-hour or two 1-hour meetings per week. A seminar-style class for freshmen and sophomores. (F)

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

100. Introduction to Linguistic Science. (4) Three 1-hour lectures and one 1-hour discussion per week. Prerequisites: 5 or concurrent enrollment. A basic technical introduction to linguistic science. Practice in phonetics, production, and transcription; practice in phonological and morphological analysis; basic steps in grammatical parsing and textual analysis. (F,SP)

105. The Mind and Language. (4) Two 1½-hour classes and one 1½-hour discussion per week. Prerequisites: Upper division standing or instructor's consent. The empirical study of conceptual systems and language from the perspective of cognitive science. Topics include: generative grammar; cognitive semantics, including frame semantics and metaphor; the Whorfian Hypothesis; and formal versus cognitive approaches to language; and implications for philosophy. (SP)

110. Introduction to Phonetics and Phonology. (4) Three 1-hour lectures and one 1-hour section per week. Prerequisites: 100 or concurrent enrollment. Description, transcription, and analysis of human speech sounds in their physiological and acoustic aspects, especially as these aids our understanding of sound change and the psychological mechanisms serving speech. (F)

111. Phonological Theory. (3) Three 1-hour lectures per week. Prerequisites: 110. Introduction to the principles of classical generative phonology and non-linear phonology, with extensive data analysis involving a wide range of phonological phenomena. (F,SP)

112. Phonological Theories. (3) Three 1-hour lectures per week. Prerequisites: 110. A survey of the most significant theories and issues in phonology in the twentieth century. (F)

115. Morphology. (3) Three 1-hour lectures and one 1-hour section per week. Prerequisites: 110. Analysis of word structure, including inflection, derivation, and compounding, in various languages. (SP)

120. Introduction to Syntax and Semantics. (4) Three 1-hour lectures and one 1-hour section meeting per week. Prerequisites: 100. An introduction to the study of the structural properties of sentences and the connections between sentence structure and sentence meaning. (SP)

121. Logical Semantics. (3) Three 1-hour lectures per week. Prerequisites: 120A. Basic logic for linguists. Basic speech act theory and pragmatics. Issues in compositional semantics. (SP)

122. Language Typology and Linguistic Universals. (3) Three 1-hour lectures per week. Prerequisites: 120. Issues in language typology and linguistic universals. An examination of various linguistic sub-systems in different languages. Topics will include: classificatory systems, relative clause formation, case systems, etc. (SP)

123. Pragmatics. (3) Three 1-hour lectures per week. Prerequisites: 120. The relation between language use and human actions. Some topics to be emphasized: conversational logic, speech act theory, politeness, social role, psychological perception of oneself and language, variation in language use. (F)

124. Discourse. (3) Three 1½-hour meetings per week. Prerequisites: 5 or 100. Language beyond the sentence. Global and local properties of connected speech. Narrative structures, new and old information, subjects and topics, foregrounding and backgrounding, etc. (F,SP)

125. Formal Theories of Syntax. (3) Three hours of lecture per week. Prerequisites: 100. The course will provide a survey of contemporary syntactic theories. There will include such formal theories of syntax as lexical functional grammar (LFG), generalized phrase structure grammar (GPSG), government and binding (GB), relational grammar (RG), etc. Emphasis will be on the development of these theories that are most significant for their basic claims and internal organization. The theories will be contrasted in terms of their architectural designs and in their treatment of selected linguistic phenomena. (SP)

130. Comparative and Historical Linguistics. (4) Three 1-hour lectures and one 1-hour discussion per week. Prerequisites: 110. Methods of reconstruction. Types and explanations of language change. Dialectology. The establishment of language relationships and subgroupings. (SP)

131. Indo-European Comparative Linguistics. (3) Three 1-hour lectures per week. Prerequisites: 130. The affinities of the Indo-European languages and the reconstruction of their common ancestor. (F)

140. Introduction to Field Methods. (3) Three 1-hour lectures per week. Prerequisites: 110 and 115. Training in the disciplines and transcription of the sounds of a particular language. Methods and practice in collecting and processing data from a particular language. (F)

150. Sociolinguistics. (2) Two 1½-hour lectures per week. Prerequisites: 100. The principles and methods of sociolinguistics. Topics to be covered include linguistic pragmatics, variation theory, social and regional dialectology, and oral styles. (SP)

155A-155B. Language and Interaction. (3,3) Two 1½ hour lecture per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: 5. The relation between the form of communication and its pragmatic and sociolinguistic effects. Topics include: conversation; misunderstanding; politeness; speech acts; dialect and bilingualism; attitudes toward linguistic variation; political and advertising language; language in the classroom, and psychotherapy. (F,SP)

158. The Use of Computers in Linguistics. (3) Three 1-hour lectures and one 1-hour lab per week. Prerequisites: 100. Topics include: the following: computer-aided instruction of foreign languages, simulating language change by programmed rules, estimating linguistic relationship using methods of genetic phylogeny, dealing with large amounts of language data, digitizing and manipulating speech signals; depending on resources available, emphasis will be on "hands-on" experience. (F)

160. Biological Foundations of Language. (3) Three 1-hour lectures and one 1-hour section per week. The dependence of language on biological attributes, considered by comparison of human and non-human communication. The physiological control of speech production and reception. Heredity and environmental factors in language development. Language in the context of overall behavior. (SP)

170. The Structure of English. (3) Three 1-hour lectures per week. Prerequisites: 120. Examination of selected patterns of contemporary English syntax, semantics, and pragmatics, from a functional perspective. (F)

175. American Indian Languages. (3) Three 1-hour lectures per week. Introduction to the native languages of the Americas. (F)

181. Lexical Semantics. (3) Three 1-hour lectures per week. Prerequisites: 120. Formerly IDS 170. Lectures and exercises in the description of word meanings, the organization of lexical systems, the lexicalization of particular semantic domains (kinship, color, etc.), and contrastive lexicalization: lexicalization pattern differences across languages. (F)

190. Upper Division Seminar. (2,3) May be repeated for credit. To be arranged. Prerequisites: Core courses (100, 110, 115, 120, 130). Seminar style class for junior and senior students. (F)

198. Directed Group Study and Research. (1-4) Course may be repeated for credit. 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. To be arranged. Must be taken on a passed/not passed basis. (F,SP)

Graduate Courses

200. Graduate Proseminar in Linguistics. (1) One 2-hour 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)

205. Advanced Cognitive Linguistics. (3) Two 1½ hours lectures per week. Prerequisites: 180 or 105 or
201. Methods in Phonological Analysis. (3) Two 1½-hour meetings per week. Prerequisites: 110. Field laboratory, and "pencil and paper" methods of analyzing phonological data from many languages. (SP)

211. Advanced Phonological Theory. (3) Three hours lecture per week. Prerequisites: 111. Extensions and readings on current issues in phonological theory. (F)

212. Advanced Phonetics and Phonology. (3) Three hours lecture per week. Prerequisites: 210. The neurophysiological and acoustic basis of speech production and perception. (F)

214. Language and Music. (3) Course may be repeated for credit. Two 1½-hour meetings per week. A seminar of selected problems in the realm of language and music. (SP)

215. Advanced Morphology. (3) Course may be repeated for credit. Two 1½-hour meetings per week. Prerequisites: 115 and 120. An examination of selected problems in derivation and compounding and their relevance to grammatical theory. (SP)

220. Syntax and Semantics. (3) Three hours of lecture per week. Prerequisites: 120. The constructional and functional or a grammatical and meaning introduced in 120 and 122 are pursued in greater depth. Various unificational approaches to syntax and semantics are compared and contrasted. (SP)

230. Historical Linguistics. (3) Two 1½-hour lectures per week. Prerequisites: 130 or consent of instructor. Historical linguistic methodology. Methods of reconstruction. (SP)

231. Historical Semantics. (3) Two 1½-hour lectures per week. Synchronic variation and diachronic change in the realm of meaning. (SP)

235. History of Linguistics. (3) Course may be repeated for credit. Two 1½-hour meetings per week. This course covers, roughly, the 5,000 year period between 1775 and 1775 AD, through concentration on a limited number of distinguished personalities whose writings are, at least in part, of continued relevance today. Bopp, Reask, Humboldt, Schleicher, Whitney, Benveniste, Andersen. (SP)

236. Major Schools of Structural Linguistics. (3) Two 1½-hour meetings per week. The linguistic theories of Saussure, the Prague School, Generative Semantics, and American Structuralism.

238. The Generativist Tradition. (3) Three hours of seminar per week. Prerequisites: 200, 111, 120. Formerly 201. An examination of the ideas, claims, methods, and philosophy-of-science stances associated with the American "Generative Linguistics" tradition that began with Noam Chomsky's 1957 Syntactic Structures. Readings will include classic works from the early generativist period, several historiographic writings from current journals. (SP)

240. Field Methods I. (3) Two 2-hour sessions per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: 210, 221 and 110. Training in elicitation and analysis of linguistic data in a simulated field setting. The same language is used throughout the year. Continuation of 240. (SP)

241. Field Methods II. (3) Two 2-hour sessions per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: 240. Training in elicitation and analysis of linguistic data in a simulated field setting. The same language is used throughout the year. Continuation of 240. (SP)

244. Micro-Computational Text Analysis. (3) Two 1 and ½-hour lectures plus individual laboratory work. Prerequisites: 100 or equivalent. To teach the skills and theory required for analysis of linguistic textural materials using a micro-computer. To train in the use of specialized programs to handle linguistic fonts, multi-lingual interlinear text processing, and concordance and index generation for text analysis. (SP)

270. Structure of a Particular Language. (3) Course may be repeated for credit. Two 1½-hour meetings per week. Prerequisites: 210 and 221. An analysis of the language structure of a particular language. The language investigated changes from year to year. (F,SP)

271. Linguistics of Southeast Asia. (3) Course may be repeated for credit. Two 1½-hour meetings per week. Prerequisites: Introduction to the major language families of mainland Southeast Asia (Mon-Khmer, Tai, Hmong, Mien, Tibeto-Burman) with special emphasis on areal typological features. (F)

272. Tibeto-Burman Linguistics. (3) Two 1½-hour lectures per week. Prerequisites: 230. An examination of the phonological, grammatical, and semantic characteristics of the various sub-groups of Tibeto-Burman: Lolo, Burmese, Karen, Kachin, Kalupapan, and Himaalayash. Reconstruction of Tibeto-Burman. (SP)

273. Theoretical Topics in Chinese Linguistics. (3) Course may be repeated for credit. Two 1½-hour meetings per week. Prerequisites: Consent of instructor. The emphasis in this course will be theoretical topics in Chinese linguistics as elucidated by material from Chinese. (SP)

275. Survey of American Indian Languages. (3) Course may be repeated for credit. Two 1½-hour lectures per week. Prerequisites: 210 and 230. Reading and discussion of classic works on American Indian languages, and detailed examination of one North American Indian language.

290. Topics in Linguistic Theory. (3) Course may be repeated for credit. Seminars or special lecture courses.

290A. Syntax. (3) Prerequisites: Consent of instructor. (SP)

290B. Semantics. (3) Prerequisites: Consent of instructor. (SP)

290C. Morphology. (3) Prerequisites: Consent of instructor. (SP)

290D. Pragmatics. (3) Prerequisites: Consent of instructor. (SP)

290E. Phonology. (3) Prerequisites: Consent of instructor. (SP)

290F. Diachronic Linguistics. (3) Prerequisites: Consent of instructor. (SP)

290G. Language Variation. (3) Prerequisites: Consent of instructor. (SP)

290H. Linguistic Reconstruction. (3) Prerequisites: Consent of instructor. (SP)

290I. Typology and Language Universals. (3) Prerequisites: Consent of instructor. (SP)

290J. Etymology. (3) Prerequisites: Consent of instructor. (SP)

290L. Additional Seminar. (3) Prerequisites: Consent of instructor. (SP)

298. Special Group Study. (2-8) Course may be repeated for credit. To be arranged. Prerequisites: Consent of instructor. Seminar or special lecture courses on linguistic topics. Students must be in good standing with the instructor. (F,SP)

299. Individual Study. (2-8) Course may be repeated for credit. To be arranged. Must be taken on a satisfactory/unsatisfactory basis. (F,SP)

602. Individual Study for Doctoral Students. (1-6) Course may be repeated for credit. May not be used for unit or residence requirements for the doctoral degree. To be arranged. Must be taken on a satisfactory/unsatisfactory basis. (F,SP)

Professional Courses

301. Teaching Practice and Instruction. (2,4) To be arranged. Must be taken on a satisfactory/unsatisfactory basis. Course may be repeated for credit, but credit for the instructional training portion is to be given only once for each individual course taught by a T.A. For graduate students currently serving as T.A.s in the Department's undergraduate courses. Two units of credit are given for the teaching experience each time a student serving as a T.A. enrolls in this course; two more units are given for teaching instruction, this takes the form of weekly conferences between instructors and their T.A.s. (F,SP)

302. Training for Linguistics Teaching Assistants. (2) 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 GSIs. 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 student work, grading, and feedback. (F,SP)

Interdepartmental Studies Courses

Graduate Courses

IDS 236. Cognitive Science Research Discussion. (1) Course may be repeated for credit. One 1½-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Student must be enrolled in the Cognitive Science Program or associated with the Cognitive Science Program. The students will interchange on the Cognitive Science-related research that they are carrying on as R.A.'s with the aim of broadening both their experience and the scope of the research. The group, in addition, will discuss relevant selected readings. This course is required of all Cognitive Science R.A.'s. Sponsoring departments: Linguistics, Philosophy, and Psychology.

IDS 237A-237B. Cognitive Science Seminar. (1,1) One 1½-hour lecture and one 1½-hour discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Weekly presentations by local and visiting researchers on a range of topics in Cognitive Science, with ensuing discussion. Sponsoring departments: Electrical Engineering and Computer Sciences, Linguistics, Philosophy and Psychology.

Logic and the Methodology of Science

Group Office: 731 Evans Hall, 642-2065
Chair: Ernest W. Adams, Ph.D.

Professors:
Ernest W. Adams, Ph.D. (Philosophy), Philosophy of Science
John W. Addison, Jr., Ph.D. (Mathematics), Logic, theory of definability

*On leave, spring
†Recipient of Distinguished Teaching Award
The Group in Logic and Methodology of Science offers an interdisciplinary program of study and research leading to the Ph.D. degree. Although the Department of Philosophy offers a major degree in logic and the methodology of science, the Department of Philosophy itself does not confer a Ph.D. degree in this field. Its purpose is to provide a major discipline in logic and methodology of science to those who would like to specialize in this area.

Graduate Adviser: Mr. Silver.

The Group in Logic and Methodology of Science is designed for students who wish to specialize in logic and the methodology of science. It is intended for students who have a broad interest in logic and the methodology of science who wish to explore the subject in both its mathematical and philosophical aspects.

Courses:
- Logic Colloquium (no credit), reportson current research and scholarly work by members of the staff, visitors, and graduate students.
- Woodin, Neale (F,SP).

Other Departments with Related Programs
- Mathematics and Philosophy.

Manufacturing Engineering
(College of Engineering)

Offices: 4135 Etcheverry Hall (IED) or 4186 Etcheverry Hall (ME)

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 program demands competence in both basic engineering and computer techniques, and the ability to solve problems and communicate effectively.

Course topics include computer-aided manufacturing, robotics, production systems, analysis, properties of materials, design techniques, and manufacturing processes. These fundamentals are applied to a variety of manufacturing industries, including integrated circuit, automobile, steel, and electronics.

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 a 4-unit course in English composition, one must be from a list of selected courses in History and Culture or that 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 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.

- Lower Division. Mathematics 1A-1B, 50A-50B; Chemistry 1A; Physics 7A-7B; Engineering 7, 25, 36, 45; Electrical Engineering and Computer Science 100. Electives must include 4 units of lower division physical science, engineering, mathematics, or statistics courses approved by the adviser.

Upper Division. Engineering 102, 120; Civil Engineering 130; Mechanical Engineering 101, 102A, 104, 105; Industrial Engineering and Operations Research 110, 130, 150, 153, 165, 180; 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 1: ME 110, 122, 128, 130, 133, 134, 135; Group 2: Industrial Engineering 115, 131, 140, 162, 164, 170. If 162 is elected, Industrial Engineering 160 should be substituted for Engineering 102.
Materials Science and Mineral Engineering

(College of Engineering)

Department Office: 210 Hearst Mining Building, 642-3801
Chair: Ronald Gronsky, Ph.D.

Professors:
- Alex Becker, Ph.D. McGill University. Exploration geophysics.
- George H. Brinckl, Jr., Ph.D. University of California at Berkeley. Economic geology.
- Neville G. Cook, Ph.D. (Donald H. Laugrinovich) Professor of Mineral Engineering University of Wisconsin. Mining sciences.
- George A. Cooper, Ph.D. University of Cambridge. Petroleum engineering.
- Didier de Fontaine, Ph.D. Northwestern University. Thermodynamics, phase transformation theory.
- Lutgard DeJonghe, Ph.D. University of California at Berkeley. Ceramic properties and processing.
- Thomas M. Dayne, Ph.D. Massachusetts Institute of Technology. Corrosion, solid-state science, and materials science.
- Michael Hood, Ph.D. University of Witwatersrand, Mining Engineering.

Assistant Professors:
- Tadeusz Ratzek, Ph.D. Silesian Technological University.
- Assistant Professors: Tadeusz Ratzek, Ph.D. (Emeritus)
- Paul A. Witherspoon, Ph.D. (Emeritus)
- Marshal F. Merrin, Ph.D. Carnegie Institute of Technology. Theoretical metallurgy, thermodynamics.

H195. Honors Colloquium. (3) Oni 3-hour seminar per week. Prerequisites: Consent of instructor required. Analysis of contemporary media in terms of access, social organization, and impact. Seminar topics: audience, objectivity, ownership and control; content analysis; alternative media; ethics and law; professionalization; advertising. Field placements: national and local news, television and radio stations, newspapers. (F,SP) Staff

197B. Social Issues in Publishing. (4) One 3-hour seminar and ten to twelve hours of field laboratory per week. Prerequisites: Consent of instructor required. Discussion of communications and language; tastes and values and standards; local culture; the economics of production and consumption; development and socialization of culture. Seminar topics include: literacy; the acquisition of manuscripts; whence the western publishing industry; publishing profession versus the book industry; first amendment publishers' rights and responsibilities. Field placements include: literary agencies; bookstores; critical reviews; publishers.

198. Directed Group Study for Advanced Undergraduates. (4) Course may be repeated for credit. Must be taken on a pass/no pass basis. Prerequisites: Regulations set by College for Letters and Science. Seminars for the group 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. Must be taken on a pass/no pass basis. Prerequisites: Regulations set by College for Letters and Science. Supervised independent study. (1-4) Credit. (F,SP) Staff

Lower Division Courses

101. The Structure of Mass Communications. (4) Two 1/2-hour lectures plus two 1-hour sections 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) Staff

102. The Effects of the Mass Media. (4) Two 1 1/2-hour lectures plus two 1-hour sections per week. Prerequisites: 10 or permission of the instructor. Introduction to the study of communication affects, television and motion pictures, radio, the effects of television, and the effects of mass media exposure on attitude change. (SP) Staff

103. The Communications Media in Public Policy. (4) Two 1-hour lectures plus two 1-hour sections per week. Prerequisites: 10 or permission of the instructor. The context for policy affecting the communications media, including legal constraints, governmental institutions, media interests, and public interest groups. Effects of the media (e.g., the violence issue and pornography) on the media, and the effects of mass media exposure on attitude change. (SP) Staff

197A. Media and Society. (4) One 3-hour seminar plus ten to twelve hours of field laboratory per week. Prerequisites: Consent of instructor required. Analysis of contemporary media in terms of access, social organization, and impact. Seminar topics: audience, objectivity, ownership and control; content analysis; alternative media; ethics and law; professionalization; advertising. Field placements: national and local news, television and radio stations, newspapers. (F,SP) Staff

Materials Science and Mineral Engineering

(College of Engineering)

Department Office: 210 Hearst Mining Building, 642-3801
Chair: Ronald Gronsky, Ph.D.
Mineral Engineering. The materials from which all fuels and manufactured goods are produced originate either from living organisms or from the crust of the earth. Mineral engineering is concerned with the latter and provides a basic source of raw materials upon which the whole fabric of modern civilization depends. This most fundamental of all branches of engineering is concerned with the exploration for geological zones of mineral enrichment, the evaluation and economic mining of those minerals, and the processing required to convert them into saleable commodities. The four-year undergraduate program leading to the B.S. degree provides a foundation of knowledge and intellectual development that will prepare the student either for professional involvement in industry or for graduate study. The first two years include the basic sciences and engineering subjects. The junior year gives a broad foundation in the topics common to all mineral engineering courses, and the senior year provides a variety of techniques to allow further inquiry into the various branches of the profession. Seniors will be offered a choice of studies in mineral exploration, mining engineering, or mineral processing/extractive metallurgy.

Materials Science and Engineering

Students in all programs in materials science and engineering must complete a total of 120 units, including units in humanities and social studies.

**Lower Division.** Required: Mathematics 1A-1B, 50A-50B; Chemistry 1A-1B; Physics 7A-7B; Geology 7, 36, 45; 16 units of electives. *Note: Physics 7C and Mathematics 50B may be taken in the junior year without any delay in the progress toward the degree; provided a total of 60 units has been completed in the first two years.*

**Upper Division.** Required: Materials Science and Engineering 100, 101, 102, 103, 104, 111, 112, 113, 130; elective from the 120 series, *Math elective,* and 27 units of electives.¹

Mineral Engineering Program

Students in the Mineral Engineering Program must complete a total of 120 units, including units in humanities and social studies.

**Lower Division.** Required: Mathematics 1A-1B, 50A-50B; Chemistry 1A-1B; Physics 7A-7B; Engineering 20, 29, 49, 58, Geology 50, 55L. *Note: Mathematics 50B may be taken in the junior year without any delay in progress toward the degree; provided a total of 61 units has been completed in the first two years.*

**Upper Division.** Required: Mineral Engineering 100, 108, 109, 110, 160, 162, 190, Geology 101, 106, Electrical Engineering 100, Engineering 172, 190, Mechanical Engineering 104, 105, Civil Engineering 100, 187 and 43 units of electives.²

Graduate Study in 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 who have successfully undertaken graduate study in materials science and engineering are eligible for graduate study. The graduate program emphasizes research. Techniques such as transmission electron microscopy, optical spectroscopy, electron paramagnetic resonance, electrical transport, x-ray emission spectroscopy, differential thermal analysis, precision calorimetry and oxygenic and high temperature mechanical testing are used for fundamental characterization of materials. Research topics include study of the mechanical, chemical, surface, thermodynamic, electrical, and magnetic properties of ceramics, metals and semiconductors and study of the kinetics, thermodynamics, and simulation of the processes by which materials are produced.

**Graduate Study in Extractive Metallurgy/Mineral Processing**

Holders of bachelor's degrees in metallurgy, mineral engineering, materials science, chemical engineering or chemistry would find this program of interest. A number of introductory and advanced level courses on the processes involved in processing of mineral deposits and in processing of mineral fuels are taught. Research concerns the thermodynamic and kinetic phenomena which are fundamental to these processes as well as the computer simulation of their operations. A combination of course work and research normally leads to the M.S., M.Eng., Ph.D. or D.Eng. degrees, qualifying the graduate for positions in industry, government organizations or universities that entail research or engineering in the production of metals, other materials or mineral fuels.

**Graduate Study in Mining Engineering**

The graduate courses in Mining Engineering encompass advanced studies of mining methods for both coal and non-coal mines. Specialist courses are offered in a number of areas. Mineral economic deals with the minerals position of the U.S. within world trade as well as the financial control of a mining enterprise. Courses in rock mechanics utilize continuum mechanics to study the design and stability of mining excavations. Laws of comminution are applied to milling, machine mining and blasting in course on rock fragmentation. Mining environment engineering includes the mechanics and thermodynamics of mine ventilation systems in addition to problems of mine gases, dust, heat, mine disasters and surface environmental impact. Fluid flow through porous media and geothermal systems are studied through analytical and numerical methods in the courses in geology.

Graduate Study in Engineering Geoscience

This program is directed toward graduate education and research in applied geophysics. The Ph.D. Program aims to provide students with undergraduate degrees in geophysics, engineering geology, physics, or mathematics. An M.S. program is available for persons currently employed in industry or government who wish to undertake graduate work in the geosciences. The program currently stresses study in mineral and oil exploration, engineering seismology, and applications of geophysical techniques in geological engineering and mapping, ocean engineering, and ground water hydrology.

Through the cooperation of the Department of Geology and Geophysics, students are encouraged to take courses in that department to complete requirements for the major in Engineering Geoscience.

**Upper Division Courses**

100. Field Trips. (1) One 4-hour field trip per week. Prerequisites: Junior standing in materials science or mineral engineering. Visits to factories and industrial laboratories concerned with metallurgical, ceramic, or electronic products, with emphasis on the materials aspects. Lectures by engineers and managers from materials industries. Written trip reports. (SP) Staff


102. Bonding, Crystallography, and Crystal Defects. (3) Two 1½-hour lectures per week. Prerequisites: Engineering 45. Bonding in solids; classification of metals, semiconductors, and insulators; crystal systems, lattices, and planes; examples of crystallographic and defect analysis in engineering materials; relationship to physical and mechanical properties. (F) Fontaine

103. Phase Transformations and Kinetics. (3) Three 1-hour lectures per week. Prerequisites: 101 and 102. The nature, origins, and kinetics of phase transformations and microstructural changes in the solid state. Atom diffusion in solids. Phase transformations through the nucleation and growth of new matrix or precipitate phases. Martensitic transformations and the application of mechanical and physical properties to control the microstructure. (SP) De Fontaine

104. Materials Characterization. (4) Two 1½-hour lectures and one 3-hour laboratory per week. Prerequisites: 102. Physical and chemical characterization of materials: Diffraction, imaging, and spectroscopy using optical, electrical, and x-ray methods for bulk and surface analysis. Mechanical, mechanical and physical properties and processes. Project laboratory focusing on mechanical, electrical, and magnetic properties of materials, and materials characterization. Field trips. (SP) Gransky

111. Electrical and Magnetic Properties of Materials. (3) Two 1½-hour lectures per week. Prerequisites: Physics 7A-7B or Physics 7A-7B and consent of instructor. Understanding of electrical and magnetic properties of materials, semiconductors, and insulators on the basis of physical principles. Control of the properties by processing. Materials for lasers and optical fibers, superconductivity. Examples of electronic, magnetic and optical device applications. (SP) Haller


113. Mechanical Behavior of Materials. (3) Three 1-hour lectures per week. Prerequisites: Engineering 45. Study of microscopic aspects of deformation including ideal strength, elementary dislocation theory, dislocation glide and high temperature deformation. Macroscopic and microscopic aspects of fracture, fatigue, and environmentally-influenced failure using fracture mechanics. Analysis of engineering failures. (F) Ritchie

120. Materials Production. (3) Two 1½-hour lectures per week. Significance of materials. Occurrence of raw materials. Scientific and engineering principles relevant to materials production and processing. Methods for production of major materials. (F) Evans

¹The program includes 43 units of elective courses, including the College humanities and social studies requirement and the departmental requirement of 26 units of upper division technical electives. Courses selected to satisfy the technical elective requirement are those that best individual educational objectives. At least three courses, selected in agreement with the undergraduate advisor, should constitute an integrated program in another field, physical, chemical, or mathematical. The College of Engineering requires six courses at least 3 units each in humanities and social studies selected from an approved list of courses for single major students and five such courses for double major students. Of these, at least one must be in English composition, or history, or government. In addition, one must be from a list of selected courses in History and Culture, one must be from a list of selected courses in History and Literature, and two must be upper division courses in the major required for the degree. Course elective and the course in History and Culture or that in Literature must be a composition course and either the course in History and Culture or that in Literature must be taken at the upper division level. Also, at least one of which is in the upper division, must be taken in the same major department. Additional math and 120 series courses may be taken to fulfill the 32-unit technical elective requirement.

²In addition to the required units of the 120 series courses, 36 of which must be taken in specific technical courses (see preceding). Electives should be selected to satisfy the electives requirement and to meet individual educational objectives.
121. Metals Processing. (3) Three 1-hour lectures per week. The principles of metals processing with emphasis on the use of processing to establish microstructures, desirable engineering properties. The techniques discussed include solidification, thermal and mechanical processing, powder processing, welding and joining, and surface treatments. (F) Staff

122. Ceramic Processing. (3) Three 1-hour lectures 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. Relationship of processing steps to microstructure development. (F) Glasser

123. Semiconductor Processing. (3) Two 1-hour lectures and one 2-hour discussion per week. Prerequisites: 101 and Engineering 45. Introduction to solid state physics, formation of microstructures, band structures, type of semiconductor and properties. Modern processing techniques, such as diffusion, ion implantation, and alloy regrowth; contact formation, mechanical and chemical processing; semiconductor analysis. (SP) Weber


125. Materials Engineering. (4) Three 1-hour lectures and one 3-hour laboratory per week. Prerequisites: 111, 112, 113 and Engineering 45. Case studies and projects concerned with the process of materials selection, including properties of ceramics, glasses, metals, and alloys. (SP) Seiferth

198. Directed Group Studies for Advanced Undergraduates. (1-4) Must be taken on a pass/no pass basis. Prerequisites: Upper division standing in Engineering. Group studies of selected topics. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for a maximum of four units per semester. Individual conferences. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor and major advisor. Supervised independent study. Please see pages 91-92 of the General Catalog for description and prerequisites. (F,SP) Staff

Graduate Courses

201A-201B. Thermodynamics and Phase Transformations in Solids. (4) Four 1-hour lectures per week. Prerequisites: 101, 102, 103 or equivalent. 201A is a prerequisite to 201B. The laws of thermodynamics, fundamental equation for multicomponent elastic solids and liquid, thermodynamics of interfaces, equilibrium criteria. Application to solution thermodynamics, point defects in solids, phase diagrams. Phase transitions, Landau rule, symmetry rules. Interfaces, nucleation theory, elastic effects, plastic deformation, heat and mass diffusivities, critical cooling rates. (F,SP) Morris

202. Crystal Structure and Bonding. (3) Three hours of lecture per week. Regular, irregular arrays of points, spheres, lattices, direct, reciprocal; crystallographic point and space groups; atomic structure; bonding, molecules, solids; bonding in inorganic and organic solids; bonding in ionic and covalent compounds, metals, minerals, polymers. (SP) de Fontaine


204. Theory of Electron Microscopy and X-Ray Diffraction. (3) Two 1-hour lectures per week. Prerequisites: 101 or equivalent. Modern electron microscopy and diffraction techniques used in the characterization of engineering materials by electron microscopy, diffraction, and spectroscopy; emphasis on detailed analysis of defects relevant to materials property. Modern techniques for optical and particle beam techniques for characterization of bulk single crystals and their crystalline and amorphous layers. Examples Hall effect, Deep Level Transient Spectroscopy, IR-Spectroscopy. (SP) Thomas

205. Defects in Solids. (3) Three 1-hour lectures per week. Prerequisites: Physics 7C or consent of instructor. Many properties of solid state materials are determined by lattice defects. This course treats in detail the structure of metal defects, defect formation and annihilation phenomena, and the influence of lattice defects on the physical and optical properties of crystalline materials. (F) Weber

*210. Materials Chemistry. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: MSE 112 or equivalent. Chemical aspects of bonding in inorganic solids and alloys; effects of surfaces, interfaces, oxide films, and temperature gradients on properties and reactions. (SP) De Jonghe

*212. Deformation, Fracture and Fatigue. (4) Four hours of lecture per week. Prerequisites: MSE 113 or equivalent. Mechanics of elastic and inelastic (including rate-dependent) constitutive behavior. Macro- and microscopic aspects of deformation; structure sensitivity of mechanical properties and fracture. (SP) Hitchings

221. Metals Processing. (3) Three hours of lecture per week. Prerequisites: MSE 202, MSE 211. Treatment of common techniques in the processing of metals from the perspective that these involve the manipulation of phase transformations and defect interactions. Modern methods of microstructure characterization, thin-film growth techniques. (F) Maillet

*222. Powder Processing and Sintering. (3) Three hours of lecture per week. Prerequisites: MSE 101 or 102 or consent of instructor. Advanced treatment of instrumentation, theory and techniques for electronic microscopy of materials, including high voltage transmission electron microscopy, scanning electron microscopy, x-ray microanalysis, energy loss spectroscopy; specimen preparation, interpretation of data; individual projects in materials science. (SP) Thomas

242. Electronic, Optical, and Ion Beam Techniques. (2) Two 1-hour lectures per week. Prerequisites: Consent of instructor. Recent developments in electronic, optical and ion beam techniques for in situ analysis. Modern electron microscopy, light microscopy, and electron diffraction techniques. Doping, radiation damage, and optical characterization techniques including Hall effect, capacitance-voltage methods, electron paramagnetic resonance, conductivity and photoluminescence, and optical absorption are used to characterize crystalline and amorphous solids. Emphasis on semiconductors and magnetic materials. (SP) Weber

*290A. High Temperature Oxidation and Corrosion. (2) Two 1-hour lectures per week. Prerequisites: Consent of instructor. Interactions of engineering materials with single and mixed oxidizing environments. Study of oxidation resistant alloys; accelerated attack and hot corrosion in energy applications. Staff

290M. Special Problems in Materials Science. (3) Three hours of lecture per week. Prerequisites: 201A or consent of instructor. Selected topics in the thermodynamic, kinetic or phase transformation behavior of solid materials. Selection of special topics is generally select 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

290X. Optical Properties of Materials. (3) Two 1½-hour lectures per week. Prerequisites: Physics 7C or consent of instructor. Interaction of electromagnetic radiation in solid materials with special emphasis on thin-film materials. Methods of measurement of optical properties. Thin-film growth techniques for optical materials. Applications to optical components and photonic devices. (SP) Staff

296. Group Studies, Seminars, or Group Research. (1-8) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Advanced study in various subjects through special seminars on topics to be selected each year. Informal group studies of special problems, group participation in comprehensive design projects or group research on common problems for analysis and experimentation. (F,SP) Staff

299. Individual Study or Research. (1-12) May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in engineering. Individual investigation of advanced materials science problems; (F,SP) Staff

601. Individual Study for Master's Students. (1-8) Units may not be used to meet either unit or residence requirements for a master's degree. May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in engineering. Individual investigation of advanced materials science problems; (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) May not be used for unit or residence requirements for the Ph.D. degree. May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in engineering. Individual study in consultation with the major field adviser, to prepare themselves for the various examinations required of candidates for the Ph.D. (and other doctoral degrees). (F,SP) Staff

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall
*Recipient of Distinguished Teaching Award

Mineral Engineering

Lower Division Courses

40. Introduction to Petroleum Engineering. (1) One hour of lecture per week. Prerequisites: Petroleum Engineering student or consent of instructor. Provides...
a global review of the Petroleum Industry, in order to acquaint new students with the structure, operations and career opportunities that exist in the industry. (F) Cooper

Upper Division Courses

100. Introduction to Mining Methods. (3) Three 1-hour lectures per week. Prerequisites: Consent of instructor. Formerly 101. This course is intended to provide broad exposure to all forms of mining in the earth sciences and as a review of modern mining methods suitable for a wider audience. The course deals with the ways in which minerals are found, evaluated and extracted from the crust of the earth. The basic techniques of mineral exploration are described, followed by discussions of project feasibility studies and extraction methods for both surface and underground mining. (F) McPherson


116. Introduction to Fluid Flow in Rocks. (2) Two 1-hour lectures per week. Prerequisites: Mathematics 50B and Physics 5C. Principles governing the movement of fluids and rocks. Techniques of measuring fluid flow parameters. Applications to typical problems in hydrogeology and engineering. (F) Narasimhan


148. Petroleum Engineering. (3) Three hours of lecture per week. Prerequisites: Senior standing in engineering. Formerly Mechanical Engineering 148. Techniques for accessing and evaluating oil and gas-bearing reservoirs. Well completion, well logging and evaluation. Completion, stimulation and well testing methods. (F) Cooper

149. Petroleum Engineering II. (3) Two 1-hour lectures per week. Prerequisites: Senior standing in engineering. Formerly Mechanical Engineering 149. Production of oil and gas and gas properties producing to maximize recovery; multiphase fluid flow, recovery mechanisms, enhanced recovery, economics. (SP) Cooper

150. Engineering Properties of Rocks. (3) One 2-hours of lecture and 3-hours of laboratory per week. Prerequisites: Geology 101 or consent of instructor. Study of the behavior and properties of rocks, ores and fluids, and their relation to geotechnical processes, geophysical exploration, mining and mineral processing. Laboratory measurements of mechanical, hydrodynamic, electrical, thermal and chemical properties of rocks. (SP) Staff

160. Mineral Processing. (3) Three 1-hour lectures per week. Prerequisites: Upper division standing. Introduction to operations and processes employed to utilize ores, minerals, and solid fuels and to extract metals from low-grade ores. Methods for separating minerals in ores and processing mineral substances are discussed from the point of operation and unit process point of view. (F) Staff


164. Mineral and Particulate Processing. (3) Two 1-hour lectures per week. Prerequisites: 160 and 162. Principles of fluidization and agglomeration. Recovery of other particulate systems. Particle characterization; particle-particle and particle-fluid interactions. Unit operations of mineral and particulate processing analyzing of size reduction, mineral separation by gravity magnetic and flotation methods, thickening and filtration, agglomeration. (F) Sastry

190. Field Trips. (1) Course may be repeated for credit. Prerequisites: Registered student in Mineral Engineering or consent of instructor. A number of mines and mineral processing plants will be visited on trips. The focus will alternate between mining operations and extractive metallurgy operations. (SP) Staff

191. Petroleum Field Trips. (1) One 4-hour field trip per week. Must be taken on a passed/not passed basis. Prerequisites: Registered student in Petroleum Engineering, or consent of instructor. Visits will be organized to various petroleum operations, petroleum and research facilities, normally within the State of California. (F) Cooper

198. Directed Group Studies for Advanced Undergraduates. (1-4) Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and major advisor. Supervised independent study. Enrollment restrictions apply; see department. (SP,SP) Staff

Graduate Courses

200. Mining of Bedded Deposits. (2) Two 1-hour lectures per week. Prerequisites: 102 or consent of instructor. Methods used for mining bedded deposits, including oil, coal, oil sands, salt. Underground technologies including longwall and room and pillar layouts. Surface mining practices including open pit mining. Principles of mine design and mine ventilation systems. Environmental impacts. (SP) Staff

203. Numerical Methods for Analyzing Fluid Flow in Rock and Soil Systems. (3) Two 1-hour lectures per week. Prerequisites: Mathematics 50B or equivalent. Theoretical and computerized examples of porous media systems. Subsurface modeling and parameter estimation. (SP) Staff

204. Analytical Methods for Fluid Flow in Soil and Rock Systems. (3) Two 1-hour lectures per week. Prerequisites: Computational fluid dynamics. Analytical methods of solving convection, diffusion and transport in soil and rock systems. (SP) Staff

205. Advanced Rock Mechanics. (3) Three 1-hour lectures per week. Prerequisites: Consent of instructor. Advanced Rock Mechanics is applied to the design of underground and open pit mines. Design methods and support requirements for shafts, tunnels, and stopes are developed, including the use of fills. Special attention is paid to the questions of stability and safety. (SP) Cook

210. Advanced Rock Mechanics. (3) Three 1-hour lectures per week. Prerequisites: 110 or Civil Engineering 119 or Civil Engineering 119. Rock mechanics are related to the design of underground and open pit mines. Design methods and support requirements for shafts, tunnels, and stopes are developed, including the use of fills. Special attention is paid to the questions of stability and safety. (SP) Cook

220. Mine Environmental Engineering. (3) Two 1-hour lectures per week. Prerequisites: 120. Sources of heat and humidity in mines. Heat conduction in rocks. Psychrometry. Computer simulation of underground climate. Mine cooling systems. Gas flow through strata. Gas drainage, Methane drainage systems. Sources of dust. Dust suppression and environmental effect of fugitive dust and fracture of rocks is studied empirically and theoretically; the application of these phenomena in practice is examined. (SP) Cook

222. Mine Environmental Engineering. (3) Two 1-hour lectures per week. Prerequisites: 110. Sources of heat and humidity in mines. Heat conduction in rocks. Psychrometry. Computer simulation of underground climate. Mine cooling systems. Gas flow through strata. Gas drainage, Methane drainage systems. Sources of dust. Dust suppression and environmental effect of fugitive dust and fracture of rocks is studied empirically and theoretically; the application of these phenomena in practice is examined. (SP) Cook

230. Potential Field Methods in Applied Geophysics. (3) Two 1-hour lectures and one hour discussion per week. Prerequisites: Grades, standing. The physical basis of gravity and magnetic surveys. Reduction of gravity and magnetic data. Theoretical anomalies of common models; estimation of parameters of disturbing bodies; spectral analysis; design of filters for derivatives, combination, and fields reduced to the pole. (SP) Staff

232. Electromagnetic Methods in Applied Geophysics. (3) Two 1-hour lectures and one hour discussion per week. Prerequisites: Grades, standing. Electromagnetic propagation in the earth with emphasis on the design and interpretation of electromagnetic surveys in mineral and geologic mapping. Plane wave and finite source fields above and within layered earth models; fields scattered from inhomogeneities in dissipative half spaces. (SP) Staff

233. Geophysical Applications of Electronic Induction. (2) One 2-hour lecture per week. Prerequisites: Consent of instructor. Broad coverage of the geologic and geotechnical applications of ground and airborne electromagnetic induction methods of geophysical exploration. Theoretical and laboratory models of exploration targets. Instrumentation, Exploration methods and procedures. Data interpretation. Illustrative examples drawn from surveys related to problems is applied to the design of underground and geologic exploration. (SP) Staff

234. Electrical Methods in Applied Geophysics. (3) Two 1-hour lectures and one hour discussion per week. Prerequisites: Grades, standing. Theory of electromagnetic exploration, laboratory and field programs. Application to exploration and environmental studies of geophysical exploration. (SP) Staff

236. Seismic imaging of subsurface structures. A number of mines and mineral processing plants will be visited on trips. The focus will alternate between mining operations and extractive metallurgy operations. (SP) Staff

246. Rock Mechanics and Reservoir Engineering. (3) One 3-hour lecture and 1-hour laboratory per week. Prerequisites: Consent of instructor. This course studies the basic principles of rock mechanics and their application to reservoir engineering. The course covers topics such as the stability of rock masses, rock stress states, deformation and failure processes in rocks, and the design of underground and open pit mines. (SP) Staff

250. Advanced Rock Mechanics. (3) Three 1-hour lectures per week. Prerequisites: Consent of instructor. Advanced Rock Mechanics is applied to the design of underground and open pit mines. Design methods and support requirements for shafts, tunnels, and stopes are developed, including the use of fills. Special attention is paid to the questions of stability and safety. (SP) Cook
236. Electronic Instrumentation, (2) One 2-hour lecture and one 3-hour laboratory per week. Prerequisites: Consent of instructor. Analog and digital methods for recording and processing signals from physical transducers. Laboratory experiments involving the use of operational amplifiers and digital conversion and elementary digital logic. (SP) Staff


242. Numerical Methods in Materials Science and Mineral Engineering, (2) Two 1-hour lectures and one hour discussion per week. Prerequisites: Consent of instructor. The application of numerical techniques to problems of interest in materials science and mineral engineering. Use and interpretation of computer algorithms and numerical procedures. Use of these procedures is then illustrated by applying them to current research problems in physical and extrinsic metallurgy, ceramics, mineral processing, and engineering geoscience. (F) Staff

244. Inverse Theory, (2) Two 1-hour lectures and one hour discussion per week. Prerequisites: Consent of instructor. Direct and inverse methods of geophysical data analysis. Gelfland-Levitan, Marchenko, and Weidelt theories for the inversion of seismic data. Fourier analysis via Gabor's theory for the direct inversion of geophysical exploration data. The Backus and Gilbert resolving power theory will be discussed with emphasis on the trade-off between resolution and certainty. (F) Staff

250. Petroleum Well Drilling and Completion, (3) Two 1½-hour lectures per week. Prerequisites: Graduating senior or junior in petroleum engineering. Principles of field drilling and completion, efficiency in selecting the proper equipment and evaluating hydrocarbon wells. Examination of the physics and mechanics underlying the various processes which are involved in drilling, completion, and testing. (SP) Cooper

256. Applied Colloidal Phenomena, (2) One 2-hour lecture per week. The characterization of colloidal materials and the physical chemistry of colloid systems. Primary emphasis on the interaction of colloidal particles, particularly in aqueous environments; flocculation, coagulation, and flocculation phenomena; selective flocculation. (SP) Fuerstenau

262. Surface Chemistry of Flotation, (2) One 2-hour lecture per week. Application of surface and crystal chemistry to the separation of minerals by flotation; selective absorption of surfactants; natural flotation; flotation of rare metals, precipitates, precipitatii, oil droplets. Fuerstenau

265. Modelling of Particulate Rate Processes, (3) Two 1½-hour lectures per week. Prerequisites: Graduates: Graduate standing in engineering. Fundamental principles of process modelling; introduction to particulate system operation; chemical industries; quantitative description of particulate systems; transport through reactors, development of population balance models and analysis of rate processes involving particle size changes, solid-liquid and solid-solid separations, and fluid-solid reactions. (SP) Sasya

266. Mineral Process Simulation, (2) One 2-hour lecture per week. Prerequisites: 265. Principles of process simulation, model validation and parameter estimation in mineral and metallurgical processes; process analysis by computer simulation; detailed description of size reduction, size enlargement, size separation and hydrometallurgical processes. (SP) Sasya

267. Mineral Process Dynamics and Control, (2) One 2-hour lecture per week. Prerequisites: 265. Principles of dynamics and control of mineral and metallurgical processes; analysis by computer simulation; detailed description of fluid-solid and solid-solid separations and pyrometallurgical processes. (SP) Sasya


275. Metallurgical Transport and Rate Phenomena, (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering. Heat, mass, and momentum transport and reaction kinetics in systems relevant to mineral processing, mineral processing, and materials processing. (F) Evans

276. Advanced Extractive Metallurgy, (2) One 2-hour lecture per week. Analysis of the major unit operations of extractive metallurgy. Emphasis on the description of the manner in which each unit operation is governed by fundamental rate phenomena. Evans

290A. Advanced topics in Subsurface Fluid Flow, (1-8) May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisite: Graduate standing in engineering. Advanced study in various subjects through special seminars on topics to be selected each year, informal group studies of special problems, group participation in comprehensive examinations, or group research on complete problems for analysis and experimentation. (1-8) Staff

299. Individual Study or Research, (1-12) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual investigation of advanced mineral engineering problems. (F,SP) Staff

601. Individual Study for Master's Students, (1-8) Units may be used to meet either unit or residence requirements for a master's degree. 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 adviser. (F,SP) Staff

602. Individual Study for Doctoral Students, (1-8) May not be used for unit or residence requirements for the doctor of philosophy degree. May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in engineering. Individual study in consultation with the major field adviser, in order to provide an opportunity to assist graduate students to prepare themselves for the various examinations required of candidates for the Ph.D. (and other doctoral degrees). (F,SP) Staff

Mathematics (College of Letters and Science)

Department Office: 970 Evans Hall, 642-6550

Professors: John W. Addison, Jr., Ph.D. University of Wisconsin. Logic, descriptive set theory.
Robert M. Anderson, Ph.D. Yale University. Mathematical logic, computational logic, proof theory.
William B. Arveson, Ph.D. University of California at Los Angeles. Functional analysis, operator algebra.
William G. Bade, Ph.D. University of California at Los Angeles. Functional analysis.
George M. Bergman, Ph.D. Harvard University. Rings, universal algebra, counterexamples.
E. R. Berlekamp, Ph.D. University of California at Berkeley. Real and complex analysis.
Paul R. Chernoff, Ph.D. Harvard University. Functional analysis.
Robert F. Coleman, Ph.D. Princeton University. Algebraic geometry.
Heinz O. Cordes, Ph.D. University of Göttingen. Classical analysis.
Reinard V. De Vogelaere, Docteur es Sciences, Catholic University of Louvain. Finite Euclidean geometry.
L. Craig Evans, Ph.D. University of California at Los Angeles. Partial differential equations.
Joseph Felsen, Ph.D. University of Chicago. Ergodic theory, operator algebras.
Andrew Fodor, Ph.D. Ruhr University, Bochum, West Germany. Symbolic dynamics, non-linear analysis.
David Gale, Ph.D. Princeton University. Mathematical economics, game theory.
David G. Goldschmidt, Ph.D. University of Chicago. Algebra, finite groups.
F. Alberto Grünbaum, Ph.D. Rockefeller University. Applied mathematics, medical imaging.
Leo A. Harrington, Ph.D. Massachusetts Institute of Technology. Recursion theory, model theory.
Robert C. Hartshorne, Ph.D. Princeton University. Algebraic geometry.
Henry Helson, Ph.D. Harvard University. Harmonic analysis, function theory.
Morris W. Hirsch, Ph.D. University of Chicago. Dynamical systems, topology.
Wo-Yi Hsiang, Ph.D. Princeton University. Transformation groups, differential geometry.
William M. Kahan, Ph.D. University of Toronto. Error analysis, numerical computations.
Robin C. Kirby, Ph.D. University of Chicago. Topology of manifolds.
Michael J. Klass, Ph.D. University of California at Los Angeles. Probability theory, concentration inequalities.
Shinobu Kobayashi, Ph.D. University of Washington. Differential and complex manifolds.
Tsit-Yuen Lam, Ph.D. Columbia University. Algebra.
Lucien M. Le Cam, Ph.D. University of California at Berkeley. Theoretical statistics, cancer research.
R. Sherman Lehman, Ph.D. Stanford University. Number theory, numerical analysis.
Henrik W. Lenstra, Jr., Ph.D. University of Amsterdam. Number theory.
Jerold E. Marsden, Ph.D. Princeton University. Mathematical physics and engineering.
Ralph N. McKenzie, Ph.D. University of Colorado. Algebra, logic, lattice theory.
Curran R. McMillen, Ph.D. Harvard University. Complex analysis, topology, dynamics.
Koichi Miller, Ph.D. Rice University. Partial differential equations.
Calvin C. Moore, Ph.D. Harvard University. Representations of topological groups.
J. C. Neubauer, Ph.D. California Institute of Technology. Applied mathematics.

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall

Returned to active service

Recipient of Distinguished Teaching Award
The Major Programs

The department offers undergraduate students a choice of two programs leading to the A.B. degree: the major in mathematics and the major in applied mathematics. Each major program in mathematics gives students the opportunity to obtain a strong, well-rounded mathematical background suitable for postgraduate study as well as for professional careers in science, industry, or education. The courses required for the major emphasize theoretical material. Students with an interest in the applications of mathematics may find the major program in applied mathematics particularly responsive to their needs. The requirements for both majors are summarized below. More detailed information is given in the Undergraduate Announcement, available from the undergraduate program coordinator in 968 Evans Hall.

General Major Requirements. Both major programs require a divisional mechanics course, Mathematics 1A-1B and 50A-50B. Courses 16A-16B are not an acceptable alternative. Math 1A-1B must be completed with average grades of C or better; Math 50A and 50B must be completed with minimum grade point average of 2.0. Transfer students should contact the undergraduate program coordinator in 968 Evans Hall prior to registering for courses.

In addition to completing the requirements for admission to the major, the minimum upper division major requirements are as follows:

Major in Mathematics. (a) Courses 104, 110, 113, and 165; (b) One course from each of the following three subject areas: I: Computing (100, 128A); II: Geometry (140, 141, 142); III: Logic and foundations (125A, 135); (c) At least eight upper division courses in all.

With the approval of the major adviser, students may count one or more of the following introductory graduate courses: 202A-202B, 214, 225A-225B, 228A-228B, 250A-250B.

Prerequisites. Mathematics 1A-1B and 50A-50B (or their equivalents). These courses must be taken for a letter grade and must be passed with average grades of C or better. The department strongly recommends that students attempt the minor only if Mathematics 50A and 50B have each been passed with a minimum grade of C.

Minor Requirements. Mathematics 104, 110, 113, and 165, plus one additional upper division mathematics course. These five courses must each be taken for a letter grade, and a minimum grade point average of 2.0 is required for upper division courses applied to the minor program. At least two of these five courses must be completed at Berkeley.

Upon completion of the required courses, students shall complete a Confirmation of Minor Program petition (available from 970 Evans Hall) and present the petition, together with a transcript (official or unofficial) to the undergraduate program coordinator, 968 Evans Hall, who will approve completion of the minor program.

Students may petition for the minor program at any time after the requirements have been completed until they graduate.

For more information about this program, please consult the undergraduate program coordinator in 968 Evans Hall.

Preparation for Graduate Study

Students preparing for graduate work in mathematics are strongly advised to acquire a reading knowledge of at least two foreign languages, from among French, German, and Russian. Course H117, designed to challenge students’ abilities to do creative thinking, is useful for students preparing for graduate work. 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 both in mathematics and applied mathematics. Detailed information concerning admission, graduate student instructorships and fellowships, and degree requirements is given in the Graduate Announcement of the Department of Mathematics, 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 semester offerings, instructors, textbooks, and seminar content, teaching and grading methods, and schedules are posted outside 910 Evans Hall before the beginning of each semester.

Lower Division Courses

Math P is intended for students who need to satisfy the quantitative reasoning requirement or who wish to take Math 1A or 16A but who have not met the prerequisites.

Math 1A-1B is the calculus sequence intended for students planning majors in mathematics, engineering, or the physical sciences. This 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.

P. Precalculus. (2) No credit will be given to students who take Math P after completing any other course in the department. Two hours lecture and two hours dis-
cussion per week. Prerequisites: Two years of high school math. A review of algebra, graphs, functions, exponential and logarithmic functions, trigonometry, inverse functions, complex numbers, binomial theorem and conics. Designed for students who wish to prepare for calculus. Two units recorded credit, but recognized as four units of work in computing study lists. (F,SP)

PS. Self-Paced Study in Precalculus. (1-2) No credit will be given to students who take Math PS after completing any other course in the department. Open consulting. Prerequisites: Two years of high school math. One or two units recorded credit, but recognized as two or four units of work in computing study lists. A self-paced version of Mathematics P. Students are strongly urged to enroll in only one unit; units of credit can be adjusted upward at the end of the semester depending on the amount of work completed. (F,SP)

1A-1B. Calculus. (4:4) Students will receive no credit for 1A or credit for 1A after taking 2A or 2:3 for 1A for 16A, no credit for 1A after 16B, and 2 units for 1B after 16B. Two hours lecture and two hours discussion; optional third hour of lecture or workshop. Prerequisites: Concurrent enrollment in Math 1A. Optional microcomputer supplement to accompany Mathematics 1A-1B. Reduced credit for students who have taken part(s) of 1A-1B or 1A-16B. Simultaneous enrollment in both sections is possible. Unit credit and grades assigned at the end of each semester, depending on the number of study units completed. Units of credit can be adjusted upward. (F,SP)

1AL-1BL. Calculus Computer Laboratory. (1:1) Two hours microcomputer laboratory per week. Must be taken on a passed/not passed basis. Prerequisites: Concurrent enrollment in Math 1A. Optional microcomputer supplement to accompany Mathematics 1A-1B. Graphing and analysis of functions and curves, including trigonometric functions. Polynomial, exponential and logarithmic functions. Maximum and minimum problems, root finding, and the graphing of derivatives. (F,SP)

*1AS-1BS. Self-Paced Study in Calculus. (1:4) Open consulting. Prerequisites: Same as 1A-1B. A self-paced version of Mathematics 1A-1B. Reduced credit for students who have taken part(s) of 1A-1B or 1A-16B. Simultaneous enrollment in both sections is possible. Unit credit and grades assigned at the end of each semester, depending on the number of study units completed. Units of credit can be adjusted upward. (F,SP)

H1A-H1B. Honors Calculus. (5:5) Three hours of lecture and two hours of discussion per week. Prerequisites: Same as 1A-1B, plus As or Bs in high school math. Honors course corresponding to 1A-1B for able students with strong mathematical inclination and motivation. Emphasis on theory, rigor, and hard problems. Recommended as preparation for the major, particularly for honors candidates. (F,SP)

3. Accelerated Freshman Calculus. (5) Students will receive no credit for 3 after taking 1B or 2A. Three hours lecture and two hours discussion per week. Prerequisites: One year of high school calculus, or consent of instructor. Covers the material of Math 1A-1B in one semester. The material of Math 1A is reviewed. Most of the time is spent on 1B material. (F,SP)

15. Concepts of Mathematics for Elementary School Teachers. (3) Three hours of lecture per week. Prerequisites: Upper division standing and consent of instructor. Development and structure of the real number system and its subsystems. Syntactic and semantic description of a higher level language. Exploration and application to more than one branch of mathematics from among group theory, number theory, systems or ordinary differential equations, basic linear algebra, and vector calculus. Prerequisites and specific topics will vary. (SP)

100. Mathematical Computations. (4) Three hours lecture per week. Prerequisites: 50A-50B. Formerly Mathematics 100. Selected topics illustrating the application of mathematical and computational theory. This course is intended for upper division students in Mathematics, Statistics, the Physical Sciences, and Engineering, and for economics majors with adequate mathematical preparation. No economics background required. Also listed as Economics 103 and IDS 103. (F,SP)

104. Introduction to Analysis. (3) Three hours lecture per week. Prerequisites: 50B. Formerly Mathematics 104. Selected topics illustrating the application of mathematical and computational theory. This course is intended for upper division students in Mathematics, Statistics, the Physical Sciences, and Engineering, and for economics majors with adequate mathematical preparation. No economics background required. Also listed as Economics 103 and IDS 103. (F,SP)

H104. Introduction to Analysis. (3) Three hours lecture per week. Prerequisites: 50B. Honors section corresponds to 104. Recommended for students who enjoy mathematics and are good at it. Greater emphasis on theory and challenging problems. (F,SP)

105. Second Course in Analysis. (3) Three hours lecture per week. Prerequisites: 104. Differential calculus 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. Rubin's theorem, change of variable. (SP)

110. Linear Algebra. (4) No credit allowed after completion of Math 112 or 113B. Three hours lecture per week. Prerequisites: 51 or 50B. Matrices, vector spaces, linear transformations, inner products, determinants. Eigenvectors. CFT factorization. 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 lecture per week. Prerequisites: 51 or 50B. Honors section corresponds to course 110 for exceptional students with strong mathematical inclination and motivation. Emphasis is on rigor, depth, and hard problems. (SP)


*On leave, spring

On leave, fall

On leave, spring, fall

On leave, fall

*Recalled to active service

Recipient of Distinguished Teaching Award
H113. Introduction to Abstract Algebra. (4) Three hours lecture per week. Prerequisites: Same as Math 113. This course is intended for students majoring 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 splitting fields and Galois theory; construction and classification of finite fields. (SP)

114. Second Course in Abstract Algebra. (4) Three hours lecture per week. Prerequisites: 113. Further topics on Galois theory. This course is intended for students who have completed 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 splitting fields and Galois theory; construction and classification of finite fields. (SP)

115. Introduction to Number Theory. (4) Three hours lecture per week. Prerequisites: 50B or 51. Divisibility, congruences, numerical functions, theory of primes. Topics selected: Diophantine analysis, continued fractions, partitions, quadratic fields, asymptotic distributions, additive problems. (SP)

*H117. Honors Mathematical Problem Solving. (4) May be repeated for credit. Three hours lecture per week. Prerequisites: Consent of instructor. Recommended for students with strong mathematical background and interest. Problems for original thought and various mathematical approaches. May include advanced topics developed through problems and open research problems.

118. Introduction to Applied Mathematics. (4) Three hours lecture per week. Prerequisites: 50AB. 110. A sample of ideas and methods from the physical sciences. Topics: duality in constrained optimization, structure of equilibrium equations (both discrete and continuous), initial value problems, 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 lecture per week. Prerequisites: 50AB. Functions of a complex variable. Fourier series, finite-dimensional linear systems. Infinite-dimensional linear systems, orthogonal 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 lecture per week. Prerequisites: 110. Existence and uniqueness of solutions, singular points, other topics selected from analytic systems, autonomous systems, Sturm-Liouville Theory, etc. (F)

125A-125B. Mathematical Logic. (4,4) Three hours lecture per week. Prerequisites: 110 or consent of instructor. Set theoretical 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 lecture per week. Prerequisites: 104. Classification of second order equations, boundary value problems for elliptic and parabolic equations, initial value problems for hyperbolic equations, existence and uniqueness theorems in simplest cases, maximum principles, a priori bounds, the Fourier transform. (SP)

128A. Numerical Analysis. (5) Three hours lecture, one hour discussion and three hours computer laboratory per week. Prerequisites: 50B. Programming for numerical computing. Vector and matrix operations, approximation and interpolation, numerical quadrature, solution of ordinary differential equations. Practice on the computer. (F,SP)

128B. Numerical Analysis. (5) Three hours lecture, one hour discussion and three hours computer laboratory per week. Prerequisites: 101 and 128A. Iterative solution of systems of nonlinear equations, evaluation of eigenvalues and eigenvectors of matrices, applications to simple partial differential equations. Practice on the computer. (F,SP)

*130. The Classical Geometries. (4) Three hours lecture per week. Prerequisites: 113 and 110. Topics from the following list: axioms for affine and projective planes, planes over a division ring, dualities, the coordinatization theorem, n-dimensional projective geometry over a field, collineations and correlations, classification of hyperbolicities, the projective group and its subgroups, non-Euclidean geometry, invariance.

132. Topics in Geometry. (4) Three hours lecture per week. Prerequisites: 113 and 104 or consent of instructor. Topics selected from such areas as classical projective geometry, inverse geometry, symplectic geometry, geometric algebra, integral geometry, convexity, and elementary topology. (F,SP)

135. Introduction to the Theory of Sets. (4) Three hours 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 lecture per week. Prerequisites: 104 or 121F. Frenet formulas, isoperimetric inequalities, local theory of surfaces 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 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. (F)

142. Elementary Algebraic Topology. (4) Three hours lecture per week. Prerequisites: 104 and 113. The topology of one and two dimensional spaces, manifolds and triangulation, classification of surfaces, Euler characteristic, fundamental groups, plus further topics at the discretion of the instructor. (F)

145. Boolean Algebra. (3) Three hours lecture per week. Prerequisites: 125A. Postulates; treatment as rings or lattices; relation to sentential calculus and calculus of classes; infinite operations; atoms; subalgebras, ideals, direct products; representation theorem. (SP)

160. History of Mathematics. (4) Three hours lecture per week. Prerequisites: 50B and 113. History of algebra, geometry, analytic geometry, and calculus from ancient times through the eighteenth century and selected topics from more recent mathematical history. (SP)

170. Linear Programming, Games, Models of Exchange. (4) Three hours lecture per week. Prerequisites: 50A-50B. Topics include linear programming, matrix games, models of production and exchange. Treats properties of the models and methods for calculating their behavior. (SP)

185. Introduction to Complex Analysis. (4) Three hours 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 definite integrals. Some additional topics such as conformal mapping. (F,SP)

H185. Introduction to Complex Analysis. (4) Three hours lecture per week. Prerequisites: 104. Honors section corresponding to Math 185 for exceptional students interested in more advanced topics in complex analysis. Emphasis is on rigor, depth, and hard problems. (SP)

*187. Senior Level Analysis. (4) Three hours lecture per week. Prerequisites: 110, 113, and 185. Course gives a comprehensive view of analysis. Emphasis is on the Lebesgue integral, the Fourier integral, differential equations, harmonic analysis and group representation, elementary functional analysis and special functions. (F,SP)

188. Mathematical Models in Physics and Engineering. (4) Three hours lecture per week. Prerequisites: 110, 121B or 185. Designed primarily for mathematics majors with little or no background in physical sciences. Study of the relationship between mathematical concepts such as discrete and continuous spectra, resolvents of linear operators, group invariance, quantum mechanics, vector analysis, and wave equation. (SP)

189. Mathematical Methods in Classical and Quantum Mechanics. (4) Course may be repeated for credit. Three hours lecture per week. Prerequisites: 104, 110, 2 semesters lower division Physics. Topics in mathematical physics with presentation from a fundamental point of view; e.g., hamiltonian mechanics and symplectic geometry, differential equations for fluids, spectral theory in quantum mechanics, probability theory and statistical mechanics. Departmental bulletin for specific topics each semester course is offered. (SP)

*191. Experimental Courses in Mathematics. (1-4) May be repeated for credit. Flexible. Prerequisites: Consent of instructor. The 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 departmental bulletins.

*195. Special Topics in Mathematics. (4) May be repeated for credit. Three hours 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.

196. Honors Thesis. (4) May be repeated for credit. Undergraduates. Prerequisites: Consent of instructor. Honors Thesis Program; an overall GPA of 3.0 and a GPA of 3.30 in the major. Independent study of a advanced topic leading to an honors thesis. (F,SP)

199. Supervised Independent Study and Research. (1-4) Flexible. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor. The standard college regulations for all 199 courses. (F,SP)


lected by the instructor may include: harmonic functions, elliptic and algebraic functions, boundary behavior of analytic functions and HP spaces, the Riemann zeta function, number-theoretic applications. (F)


*209. Operator Algebras. (4) Three hours lecture per week. Prerequisites: 206. Elementary C*-algebra theory. Connections with group representations. Basic von Neumann algebra theory. Density theorems, normal states, traces. Further topics may include: basic K-theory of C*-algebras, applications to physics such as the Stone-Von Neumann theorem, automorphism groups, C*-dynamical systems. (F)

*210. Nonlinear Functional Analysis. (4) Three hours lecture per week. Development of the fundamental equations describing the behavior of fluid continuum followed by the treatment of special topics selected to exhibit different physical situations, analytical techniques, and approximate methods of solutions. (F)

212. Several Complex Variables. (4) Three hours lecture per week. Prerequisites: 208 and 209 or their equivalents. Powerseries developments, domains of holomorphy, Hartogs’ phenomenon, pseudoconvexity and pseudoconvexity. The problem treated may either sheaf cohomology and Stein manifolds, or the theory of analytic subvarieties and spaces. (F)

*213A-213B. Mathematical Economics. (3,3) Two hours lecture per week. 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 topics as possible, including theories of preferences, utility, demand, probabilistic, game 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 IDS 213A-213B. (SP)

214. Differentiable Manifolds. (4) Three hours lecture per week. Prerequisites: 202A. Smooth manifolds and maps, tangent and normal bundles. Sard’s theorem and transversality. Whitney embedding theorem. Morse functions, differential forms, Stokes’ theorem, Frobenius theorem. Basic notions of de Rham cohomology. Lie derivative, Lie groups and algebras. Additional topics selected by instructor. (F,SP)

215A-215B. Algebraic Topology. (4,4) Three hours lecture per week. Prerequisites: 119 and point-set topology (e.g. 202A). Fundamental group and covering spaces. Singular and homology theory with applications, cohomology theory, duality theorem. Homotopy theory, fibrations, relations between homotopy and homology, obstruction theory, and topics from spectral sequences, cohomology operations, and characteristic classes. Sequence begins Fall. (F)

219. Ordinary Differential Equations and Flows. (4) Three hours lecture per week. Prerequisites: 214. Ordinary differential equations and semiflows and flows on manifolds. Stable manifolds, generic properties, structural stability. Special topics selected by the instructor. (F)

221. Advanced Matrix Computations. (4) Three hours lecture per week. Prerequisites: 126A-126B, or equivalent. Direct and iterative methods for solution of linear systems, including large sparse systems; error bounds, iteration methods, least square approximation, eigenvalues and eigenvectors of matrices, norm estimates, and minimization of functions. (F)

222A-222B. Partial Differential Equations. (4,4) Three hours lecture per week. Prerequisites: 105 or 202B; 165. 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. (F)

224A-224B. Mathematical Methods for the Physical Sciences. (4,4) Three hours lecture per week. Prerequisites: 110, 104 and 185, or 121A-121B. Introduction to course. Fourier and Laplace transforms. Partial differential equations. Green’s function. Operator theory, with applications to one-parameter unitary groups, eigenfunction expansions, perturbation theory. Sequence begins Fall. (F)

225A-225B. Metamathematics. (4,4) Three hours lecture per week. Prerequisites: 222B and 135. The metamathematics of predicate logic. Completeness and compactness theorems. Interpolation theorem, definability, theory of models. Metamathematics of number theory, applications to truth and provability. Undecidable theories. Sequence begins Fall. (F)

226A. Abstract Machines and Languages. (4) Three hours lecture per week. Prerequisites: 226A or consent of instructor. Topics 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. (F)

250A. Groups, Rings, and Fields. (4) Three hours lecture per week. Prerequisites: 114 or consent of instructor. Group theory, including the Jordan-Holder theorem and the Sylow theorems. Basic theory of rings and their ideals. Unique factorization domains and principal ideal domains. Modules. Chain conditions. Fields, including fundamental theorem of Galois theory, the theory of finite fields, and transcendence degree. (F)

250B. Multilinear Algebra and Further Topics. (4) Three hours lecture per week. Prerequisites: 250A. Tensor algebra and exterior algebra, with application to linear transformations. Commutative ideal theory, localization. Elements of Galois theory and valuation theory. Related topics in algebra. (SP)

251. Ring Theory. (4) Three hours lecture per week. Prerequisites: 250A. Topics such as: Noetherian rings, rings with descending chain condition, theory of the radical, homological methods. (F)

252. Representation Theory. (4) Three hours 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 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. (F)

254A-254B. Number Theory. (4,4) Three hours lecture per week. Prerequisites: 250A. Valuations, units, and ideals in number fields, ramification theory, quadratic and cyclotomic fields, topics from class field theory. Local fields. L-Functions and zeta functions. Zeta functions of varieties richer than first-order. (F)

255A-255B. Foundations of Geometry. (4,4) Three hours lecture per week. Prerequisites: 250B and 251B. Historical introduction of finitistic and axioms of

*Not offered 1991-92
*On leave, spring, fall
*On leave, leave

256A-256B. Algebraic Geometry. (4,4) Three hours lecture per week. Prerequisites: 250A. Affine and projective algebraic varieties. Theory of schemes and morphisms of schemes. Smoothness and differentiability in algebraic geometry. Coherent sheaves and their cohomology. Riemann-Roch theorem and selected applications. Sequence begins Fall. (F) (SP)

*257. Group Theory. (4) Three hours lecture per week. Prerequisites: 250A. Topics such as: generators and relations, free groups, infinite discrete groups, Lie type, permutation groups, character theory, solvable groups, simple groups, transfer and cohomological methods.

258. Classical Harmonic Analysis. (4) Three hours lecture per week. Prerequisites: 256 or a basic knowledge of real, complex, and linear analysis. Basic properties of Fourier series, convergence and summability, conjugate functions, Hardy spaces, boundary behavior of analytic and harmonic functions. Additional topics at the discretion of the instructor. (F, SP)

259. Transformation Groups. (4) Three hours lecture per week. Prerequisites: 215A and 214. Topological groups, Haar measure, general theory of topological transformation groups, the existence of slices and applications, the Smith theory of periodic transformations. (F, SP)

260. Abstract Harmonic Analysis. (4) Three hours 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, the discrete group representation of noncommutative locally compact groups. (SP)

261A-261B. Lie Groups. (4,4) Three hours lecture per week. Prerequisites: 214. Lie groups and Lie algebras; fundamental theorems of Lie, general structure theory; compact, nilpotent, linearizable, 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, if time permits. In view of its simplicity and its wide range of applications, it is preferable to study compact Lie groups and their representations in 261A; Sequence begins Fall. (F) (SP)

265. Differential Topology. (4) Three hours lecture per week. Prerequisites: 214 plus 215A or some familiarity with algebraic topology. Approximations, degrees of maps, vector bundles, tubular neighborhoods; introduction to Morse theory, handlebodies, cobordism, surgery. Additional topics selected by instructor from: characteristic classes, classification of manifolds, immersions, embeddings, singularities of maps. (SP)

271. Topics in Foundations. (4) May be repeated for credit. Three hours lecture per week. Prerequisites: Consent of instructor. Topics of current interest in mathematical analysis and its applications.

*273. Advanced Numerical Analysis. May be repeated for credit. Three hours 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. (SP)

*273A. Ordinary Differential Equations. (4) Three hours lecture per week.

*273B. Initial Value Problems. (4) Three hours lecture per week.

273C. Boundary Value Problems. (4) Three hours lecture per week. (F)

273D. Finite Element Methods. (4) Three hours lecture per week. (F)

273E. Topics in Numerical Linear Algebra. (4) Three hours lecture per week. (F)

273F. Topics in Computational Physics. (4) Three hours lecture per week.

273G. Nonlinear Equations and the Minimization of Functions. (4) Three hours lecture per week.

273H. Monte Carlo Methods. (4) Three hours lecture per week.

273I. Approximation Theory. (4) Three hours lecture per week.

273J. Ill-Posed Problems. (4) Three hours lecture per week.

273K. Inverse Problems. (4) Three hours lecture per week.

274. Topics in Algebra. (4) May be repeated for credit. Three hours 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. (F, SP)

275. Topics in Applied Mathematics. (4) May be repeated for credit. Three hours 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. (SP)

276. Topics in Topology. (4) May be repeated for credit. Three hours 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. (F, SP)

277. Topics in Differential Geometry. (4) May be repeated for credit. Three hours 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. (F, SP)

278. Topics in Analysis. (4) May be repeated for credit. Three hours 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. (SP)

279. Topics in Partial Differential Equations. (4) May be repeated for credit. Three hours 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. (SP)

280A-280B. Mathematical Theory of Relativity. (4,4) Three hours lecture per week. Prerequisites: 140 or consent of instructor. Special theory of relativity, reformulation of classical physical theories in relativistic form, principle of equivalence, Einstein's theory of gravitation, astrophysical and cosmological problems. Additional topics chosen by the instructor.

290. Seminars. (1-5) May be repeated for credit. Varies. Topics in foundations of mathematics, theory of numbers, numerical calculations, analysis, geometry, topology, algebra, and their applications, by arrangement. Examination of lectures and informal conferences; work based largely on original memos. (F, SP)

295. Individual Research. (1-12) Course may be repeated for credit. By appointment. Sections 1-30: letter grading; sections 31-60: S/U grading. Intended for candidates for the Ph.D. degree. (F, SP)

299. Reading Course for Graduate Students. (1-6) May be repeated for credit. By arrangement. Sections 1-30: letter grading; sections 31-60: S/U grading. Investigation of special problems under the direction of members of the department. (F, SP)

600. Individual Study for Master's Students. (1-6) Units may not be used to meet either unit or residence requirements for a master's degree. May be repeated for credit. By appointment. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for master's degree. Individual study for the comprehensive or language requirements in consultation with the field adviser. (F, SP)

Professional Courses

300. Teaching Workshop. (3) Two hours lecture per week, plus class visits. Must be taken on a satisfactory/unsatisfactory basis. Mandatory for all graduate student instructors teaching for the first time in the department. The course consists of practice teaching, attendance at standard classroom methods, guided group and self-analysis of videotapes, reciprocal classroom visits, and an individual project. (F, SP)

301. Undergraduate Mathematics Instruction. (1-2) May be repeated once for credit. Two to three hours of seminar and four hours (for two units) of tutoring per week. Must be taken on a passed/not passed basis. Prerequisites: Permission of SLC instructor, as well as sophomore standing and at least a B average in two semesters of calculus. Apply at Student Learning Center during ACE. May be taken for one unit by special permission of instructor. Tutoring at the Student Learning Center or for the Professional Development Program. (F, SP)

Other Departments and Groups with Related Programs

Biostatistics

Electrical Engineering and Computer Sciences

Industrial Engineering and Operations Research

Logic and the Methodology of Science

Science and Mathematics Education

Statistics

Mechanical Engineering

(College of Engineering)

Department Office: 6185 Etcheverry Hall, 642-1338
Chair: Clayton D. Mote, Jr., Ph.D.
Professors:

David M. Austrian, S.C.D. Massachusetts Institute of Technology. Dynamic systems, automatic controls

Stanley A. Berger, Ph.D. Brown University. Fluid mechanics

David B. Boggs, Ph.D. Brown University. Elasticty, plasticity

Van P. Carey, Ph.D. State University of New York-Buffalo. Transport in multiphase systems, thermodynamics of phase-change processes

David J. Davis, Ph.D. University of California at Berkeley. Composite materials

David A. Dooner, Ph.D. (Director, Engineering Systems Research Center) University of Washington. Manufacturing processes, robotics

A. Carles Fernandez-洒ello, Ph.D. University of California at San Diego. Combustion, heavy and condensed fuels

Lain Fiesche, D.Sc., S.C.D. Massachusetts Institute of Technology. Behavior, processing of materials

Ralph Greif, Ph.D. Harvard University. Thermal radiation, phase change

Carl J. Hedrick, Ph.D. Stanford University. Control systems, transportation systems

Chieh S. Hsu, Ph.D. Stanford University. Nonlinear dynamical systems

Joseph A. C. Humphrey (Vice Chair), Ph.D. Imperial College. Experimental and computational transport phenomena

Frederick C. Hurburt, Ph.D. University of California at Berkeley. Fluids. Refined fuels, gas dynamics

Shiro Kobayashi, Ph.D. (FANUC Professor of Mechanical Engineering) University of California at Berkeley. Metallurgical processes and design

George Leitmann, Ph.D. (A. Wallace and Elizabeth Hughes Professor of Mechanical Engineering) University of California at Berkeley. Dynamic systems, numerical calculations

Mark M. Meeks, Ph.D. Massachusetts Institute of Technology. Computational mechanics

Boris Rovinsky, Ph.D. Massachusetts Institute of Technology. Heat, mass transfer, cryopreservation

Robert F. Sawyer, Ph.D. Princeton University. Combustion, fossil and synthetic fuels

Fred W. Sherman, Ph.D. University of California at Berkeley. Thermodynamics, heat transfer, propulsion

Robert F. Stedel, Jr., D.Eng. University of California at Berkeley. Mechanical vibrations, mechanical engineering systems
clear 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 enlarge their scientific and technological capability. Further details on undergraduate and graduate fields of emphasis in mechanical engineering are available in the Announcement of the College of Engineering. The department also makes available a brochure detailing the undergraduate and graduate programs in mechanical engineering.

Curriculum for the Bachelor's Degree

A total of 120 units is required, including:

- **Lower Division.** Mathematics 1A-1B, 50A-50B; Chemistry 1A; Physics 7A-7B-7C; Engineering 7, 28, 36, 45; 17 units of electives.

- **Upper Division.** Mechanical Engineering 102A-102B, 104, 105, 107A-107B, 108; Electrical Engineering and Computer Sciences 100; Civil Engineering 130; 27 units of electives.

**Mechanical Engineering Options.** The following groups of electives are presented to help undergraduates focus their choices on specific professional goals. Each undergraduate program requires more courses than can be taken within the standard allowance. (For requirements, see footnote). The electives need not be from any single group.

- **Applied Mechanics.** Engineering 117, 118; Mechanical Engineering 133, 134, 161, 173, 175, 185, 282; Mathematics 104.

- **Controls.** Engineering 118; Mechanical Engineering 130, 133, 134, 175; Electrical Engineering and Computer Sciences 120, 128.

- **Biomechanical Engineering.** Biology 1A, 150; Engineering 153, 290A; Electrical Engineering and Computer Sciences 145A, 145B, 145L, 146S, 146B, 146S, 146C; Mechanical Engineering 130, 134, 135, 171, 173, 213; Anatomy 108; Physiology 1, 100A, 109; Interdepartmental Studies 111.

- **Mechanical Engineering 133, 134, 135, 175; Mechanical Engineering 102A-102B, 104, 105, 107A-107B, 108; Electrical Engineering and Computer Sciences 100; Civil Engineering 130; 27 units of electives.

**Upper Division Courses**

- **Lower Division Courses**

- **Mechanical Behavior and Processing of Materials.** Three hours of lecture per week. Prerequisites: Engineering 28. Application of principles of mechanics, material science and manufacturing processes to the design of components and complete machines which must meet prescribed functional requirements. Synthesis and analysis of a major machine design project. (F,SP)

- **Mechanical Engineering Design.** Three hours of lecture per week. Prerequisites: Engineering 36 (recommended); Mathematics 50B. Principles of Newtonian Dynamics of a particle or systems of particles and

**Graduate Programs**

Both master's and doctoral programs are available. The student may choose either a scientific emphasis in particular areas or integrated studies directed toward professional goals. Graduate students are placed into Master of Science and Ph.D. degrees in the following areas:


- **Materials Processing and Manufacturing Management.** Engineering 102, 120; Mechanical Engineering 130; 131, 133, 134, 135, 136, 137, 138, 139, 140, 142, 151, 173, 213; Civil Engineering 148, 149.

- **Environmental Engineering.** Engineering 117, 150, 156, 160; Mechanical Engineering 110, 140, 151; Mineral Engineering 148, 149.

- **Fluid Mechanics and Aeronautics.** Engineering 117, 118; Mechanical Engineering 133, 134, 151, 161, 162, 163, 173, 175, 185; Civil Engineering 151.

- **General Mechanical Engineering.** Mechanical Engineering 117; Mechanical Engineering 110, 133, 134, 161, 173, 175.

- **Heat and Mass Transfer.** Engineering 117, 160; Mechanical Engineering 140, 142, 151.

- **Nuclear Engineering.** Nuclear Engineering 101, 110, 122, 128, 130, 133, 134, 135.

- **Naval Architecture.** Naval Architecture 151, 152A-152B, 153, 155; Civil Engineering 120, 131; Mechanical Engineering 132, 133, 134, 152, 157; Mathematics 120A-120B.

- **PhD in Nuclear Engineering.** Nuclear Engineering 101, 120, 150, 152A-152B, 153, 157; Mechanical Engineering 132, 134, 151, 161, 173; Physics 137; Mathematics 120A-120B.

**Mechanical Engineering 101, 128, 130, 134, 135, 170; Electrical Engineering 125; Industrial Engineering 140, 170.**
of rigid bodies in one and two-dimensional motions. (F,SP) Willis

105. Thermodynamics. (4) Four hours of lecture per week. Prerequisites: Chemistry 1A; Mathematics 50A; Physics 7A. First and second laws of thermodynamics, thermodynamic processes, availability, reversible systems, cycles, statistical mechanics and microcanonical-based properties. (F,SP) Fernandez-Pello

106. Fluid Mechanics. (3) Three hours of lecture per week. Prerequisites: Mathematics 51; Physics 70C or 106. Fluid properties; hydromechanics; mass, momentum and energy balances for finite control volumes; analytical description of simple inviscid and viscous flows. Flow measurement. Empirical description of turbulent flow. Modal laws. Applications of the equations and through conduits, meters and machines. (F,SP) Coilea

107A. Experimentation and Measurement. (3) Three hours lecture first 10 weeks, no lectures last 5 weeks, 3 hours of laboratory for full term. Prerequisites: 104, 106, 108 (may be taken concurrently): EECS 100. Methods and procedures for experimental investigation of mechanical engineering phenomena and systems. Experimental design, measurement systems, data processing and data reduction. Modeling of measurement systems and feedback systems. Technical communication skills. (F,SP) Johnson

107B. Mechanical Engineering Laboratory. (4) Seven hours of laboratory per week. Prerequisites: 107A. Experimental investigation of engineering systems and phenomena of interest to mechanical engineers. Design and planning of experiments. Analysis of data and reporting of experimental results. (F,SP) Staff

109. Heat Transfer. (3) Three hours of lecture per week. Prerequisites: 105 and 108. Conduction, convective and radiative transport of thermal energy, boiling and condensation heat transfer, heat exchangers. (F,SP) Pagni

110. Mechanical Engineering—Project Engineering. (3) Three hours of lecture per week. Prerequisites: 107A (which may be taken concurrently) and 107B. To introduce concepts of project engineering systems by having students complete preliminary design of a realistic mechanical engineering system and by design seminars and conferences. (F,SP) Steidel

112. Processing of Materials in Manufacturing. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 102A; Civil Engineering 130. Fundamentals of material forming (casting, forging, rolling, extrusion, spinning, powder forming, metal cutting, welding and joining and casting); selection of metals, plastics and other materials relative to the design and choice of manufacturing processes. (SP) Ghoniem

128. Computer-Aided Mechanical Design. (3) Three hours of lecture per week. Prerequisites: 102B, Engineering 28, Civil Engineering 130, and Mathematics 20B, or consent of Instructor. Introduction to interactive computer, computer graphics in a PLOT/10-10GL color graphics environment, and numerical methods for design and optimization of mechanical systems. (F,SP) Pisanio


133. Mechanical Vibrations. (3) Three hours of lecture per week. Prerequisite: 104. An introduction to the theory of mechanical vibrations and some of the practical aspects of harmonic motion, resonance, transient and random excitation, applications of Fourier analysis and convolution methods. Multibody systems of freedom discrete systems including principal mode, principal coordinates and Rayleigh's principle. (F) Tongue

134. Automatic Control Systems. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Mathematics 50B; Physics 5C; Engineering 7. Formulation of mathematical models of active and passive, linear and non-linear dynamic systems; State equations and system stability; Linear control systems—STC design and prototyping of mechanical systems that use microprocessors to control machine activities; acquire and analyze data, and interact with operators. The analysis of manufacturing and control systems in operation and the design of control systems. (F,SP) Packard

135. Design of Microprocessor-Based Mechanical Systems. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Engineering 7. This course provides the conceptual design and prototyping of mechanical systems that use microprocessors to control machine activities; acquire and analyze data, and interact with operators. The applications of the control systems in operation and the design of control systems. (F,SP) Packard

136. Thermal Environment Control. (3) Three hours of lecture per week. Prerequisites: 105, 106, and 109 (may be taken concurrently). Systems and processes for the production and control of thermal environments for human habitation and other applications. Specific topics include refrigeration component and system analysis, cryogenic systems, absorption refrigeration, psychrometrics, human comfort criteria, air-conditioning, solar radiation effects, and heat transmission in buildings. The course emphasizes the use of computer simulation as a tool for analysis of thermal systems. (SP) Carey

142. Elementary Hydrodynamics. (3) Three hours of lecture per week. Prerequisites: Mathematics 50A-50B. Engineering 117 recommended. This course provides an introduction to Classical Hydrodynamics aimed at senior undergraduate and first-year graduate students. The course is mainly theoretical and makes use of analytical techniques, especially complex variable theory, for solving two-dimensional and axisymmetric flow problems. Applications are made to flow past airfoils, hydrofoils, to internal channel flows, free streamline flows, and surface waves. Viscous effects are discussed briefly. (F) Marcus

143. Engineering Aerodynamics. (3) Three hours of lecture per week. Prerequisites: 105. Introduction to the lift, drag, and moment of two-dimensional airfoils, three-dimensional wings, and the complete airplane. Calculations of life performance and stability of airplanes in subsonic flow. (SP) Rubinsky

175. Intermediate Dynamics. (3) Three hours of lecture per week. Prerequisites: 104, Lagrangian Mechanics. Theory of constraints, virtual displacement and generalized coordinates; Lagrangian function, Hamilton's principles and equations of motion; first integrals; engineering applications to constrained motion of particles and rigid bodies, oscillations, gyrodynamic and electro-mechanical problems. (F) Lane

185. Introduction to Continuum Mechanics. (3) Three hours of lecture per week. Prerequisites: Physics 7A; Mathematics 50B. Kinematics of deformation, the concept of stress, conversion of mass and energy through linear momentum, angular momentum and energy. Mechanical constitutive equations for ideal fluid, linear elastic solid. (F,SP) Naghdi

189. Directed Group Study for Advanced Undergraduates. (1-4) May be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and good academic standing. Group study of a selected topic in mechanical engineering. Credit for 199 or 199 courses combined may not exceed 4 units in any one semester. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for a maximum of four units per semester. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and major adviser. Supervised independent study. Please see pages 91-92 of the General Catalog for description and prerequisites. (F,SP) Staff

Graduate Courses

207. Experimental Methods in Mechanical Engineering. (3) One and one-half hours of lecture and 3 hours laboratory per week. Prerequisites: Graduate standing. Principles of physical measurements; instrumentation response and characteristics. Measurement techniques in fluid mechanics, heat transfer, combustion, and solid mechanics. Experimental design and experience in the use of contemporary measurement systems. Term project.

210. Biological Control Systems. (3) One and one-half hours of lecture and three hours of laboratory per week. Prerequisites: Graduate standing or permission of instructor. Engineering analysis, especially application of modern control theory to complex biological systems; dynamic engineering evaluation of animal-physiological elements. Experimental methods applied to biological control systems in the laboratory, with specialized bioengineering transducers and on-line digital computers. Digital simulation to interpret experimental data and to elucidate design features of these living systems. (F) Staff

212. Heat and Mass Transport in Biomedical Engineering. (3) Students who took 291B 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, biologically active materials. Derivation of mathematical models and discussion of experimental procedures. Applications to biomedical engineering. (SP) Rubinsky

213. Physiological Fluid Mechanics. (2) Two hours of lecture per week. Prerequisites: 106A or equivalent; 298A or equivalent. Analysis of the physiological aspects of various systems, including circulatory, pulmonary, and renal system. Motion in the large and small blood vessels. Pulsed and peristaltic flow. Analysis of prosthetic devices.

220. Case Studies in Mechanical Engineering. (1) One hour of lecture/discussion per week. Prerequisites: One graduate semester. Studies of selected problems that illustrate various methods of the design process in


224. Mechanical Behavior of Engineering Materials. (3) Three hours of lecture per week. Prerequisites: Civil Engineering 130 or consent of instructor. Treatment of elastic, plastic, and creep deformation under steady and cyclic loads, with emphasis on approximate solutions which enable the prediction of service performance from simple tests. Failure due to fatigue, creep, rupture and plastic instability will also be covered. (F) Finnie.


226. Computer-Aided, Optimal Mechanical Design. (3) Three hours of lecture per week. Prerequisites: Graduate standing and the equivalent of both 102B and 128. This course will cover the optimal mechanical design of mechanical systems and components. A variety of optimization techniques will be developed, applied to mechanical design, and implemented on the computer. (F) Pisano.

227. Design of Basic Electro-Mechanical Devices. (3) Three hours of lecture per week. Prerequisites: EECS 100, graduate standing or consent of instructor. Fundamental principles of magnets, electro-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 the overall design will be discussed. Typical applications covered will be linear and rotary actuators, stepper motors, AC motors, and DC brush and brushless motors. A design project is required. (SP) Lieu.

230. Real-Time Applications of Mini and Micro Computers. (3) Three hours of lab 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, with special emphasis on computer architecture, programming, and output/input operation, and through laboratory work with mini and micro computer systems. (F) Doolittle.

231. Advanced Kinematics and Mechanisms. (3) Three hours of lecture per week. Prerequisites: 104. Kinematics and dynamics of rigid and flexible (rotating) bodies. Kinematic and dynamic mechanisms. Emphasis on computer-aided design using modern numerical and matrix methods. Synthesis of planar and spatial mechanisms to guide a rigid body through multiple positions with finite and infinitesimal displacement constraints. (SP)


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 Gaussian Problem, Adaptive Control, Model Reference Adaptive Systems, Self Tuning Regulators, Repetitive Control, Application to engineering systems. (SP) Tomizuka.

235. Switching Control and Computer Interfacing. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 236. Design and analysis of control systems utilizing switching elements. Electronic and microprocessor devices for sequential logic. Applications to control of mechanical systems and control computer interfacing. (SP)


243. Evaluation of Petroleum Production Processes. (3) Three hours of lecture per week. Prerequisites: Basic knowledge of economics. Physical and economic factors underlying the appraisal of oil and gas properties, design and evaluation of oil and gas reserves. Profitability analysis, optimization of expenditures. Udell.

247. Subsurface Reservoir Characterization. (3) Three hours of lecture per week. Prerequisites: Basic geology and a course in mechanics of materials. Fundamentals of reservoirs; properties of rocks and sediments, fluid flow through geologic materials. Reservoir drive mechanisms; rock behavior, under confined stress and pore pressure; thermal stresses, thermal chemical behavior, hydraulic fracturing; well stimulation and rock drilling. Udell.


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) Eibeck.

252. Heat Convection. (3) Three hours of lecture per week. Prerequisites: 151; 265A; 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) Grell.

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. (SP) Grigoropoulos.


255. Thermodynamics II. (3) Three hours of lecture per week. Prerequisites: 254. Equilibrium and non-equilibrium processes in high temperature gases applied to chemically reacting systems, energy transfer, combustion problems, laser, and other plasma. Microscopy of flames and other gas systems. (SP) Dibble.


257. Advanced Combustion. (3) Three hours of lectures per week. Prerequisites: 256. Critical analyses of combustion phenomenon. Conservation relations applied to reacting systems studied both by asymptotic and numerical methods. Real hydrocarbon kinetics are used; where available, reduced kinetic mechanisms are introduced. Flame propagation theory and experiments are discussed in detail for both laminar and turbulent flows. (F) Hernandez-Pello.

258. Heat Transfer with Phase Change. (3) Three hours of lecture per week. Prerequisites: 151. Heat transfer associated with phase change processes. Topics include thermodynamics of phase change, evaporation, condensation, sublimation, nucleation, and bubble growth, two phase flow, convective boiling and condensation, melting and solidification. (SP) Carey.


265B. Viscous Flow. (3) Three hours of lecture per week. Prerequisites: 185 and 265A. Mathematical properties of Navier-Stokes equations. Scaling. Perturbation theory. Flow at low and moderate Reynolds

267. Geophysical Fluid Mechanics. (3) Three hours of lecture per week. Prerequisites: 265A or equivalent. An introduction to the fluid mechanics and atmospheric motions of the Earth's interior (mantle and core). Bouyancy and creep, and the transport of wave propagation in rotation and stratified flows. (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 control of deterministic systems. Applications to aerospace engineering, economics, and biological systems.

273. Oscillations in Linear Systems. (3) Three hours of lecture per week. Prerequisites: 104 and 133. Response of discrete and continuous dynamical systems, damped and undamped, to harmonic and general time-dependent loading. Convolution integrals and Fourier and Laplace Transform methods. Lagrange's equations, Hamilton's equations, the harmonic oscillator, Cartesian coordinates; nonreciprocal 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, canonical transformations, Hamilton-Jacobi theory, integrability, Poincare map, normal form, KAM theory, chaotic dynamics. (Ma)

277. Oscillations in Nonlinear Systems. (3) Three hours of lecture per week. Prerequisites: 175. Oscillations in nonlinear systems having one or two degrees of freedom. Qualitative and quantitative methods: graphical, iteration, perturbation, and asymptotic methods. Self-excited oscillations, limit cycles, and domain of attraction. Ma

279. Continuous Dynamic Systems Analysis. (3) Three hours of lecture per week. Prerequisites: Second year graduate standing. Exposition of techniques of discretization in continuous dynamic systems which precede the analysis of the model. Modern methods of analysis and solution. Stability analysis is stressed. (F,SP) Pagni

280. Introduction to the Finite Element Method. (3) Three hours of lecture per week. Course develops the foundations of the finite element method for applications to solid and fluid mechanics, dynamics, heat transfer, and field problems. Variational and weighted residual methods and their development. Emphasis on the formulation of elements, state equations, and on applications. Computation is required at a minimum level. (SP)

281. Methods of Tensor Calculus and Differential Geometry. (3) Three hours of lecture per week. Prerequisites: Mathematics 208. Methods of tensor calculus and classical differential geometry. The tensor concept and the calculus of tensors, the Riemann-Christoffel tensor and its properties, Riemannian and Euclidean space as a special case, a surface model of Weingarten, and equations of Gauss and Codazzi-Bogoy

282. Theory of Elasticity. (3) Three hours of lecture per week. Prerequisites: 185. Fundamentals and general theorems of the linear theory of elasticity (in three dimensions) and the formulation of static and dynamic boundary value problems. Application to torsion, flexure, bending, 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) Naghdi

283. Wave Propagation in Elastic Media. (3) Three hours of lecture per week. Prerequisites: 185. Propagation of mechanical disturbances in unbounded and bounded media. Surface waves, wave reflection and transmission at interfaces and boundaries. Stress waves due to periodic and transient sources. Some additional topics may vary with instructor. (SP) Hsu


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 equations for finite defor- mationelastic-plastic materials. Discussion of strain-hardening and special cases. Applications. (SP) Naghdi


289. Theory of Shells. (3) Three hours of lecture per week. Prerequisites: 185 and 281. A direct formulation of a general theory of shells and plates based on the concepts of displacement and deformation. Nonlinear constitutive equations for finitely deformed elastic shells. Linear theory and a special nonlinear theory with small strain accompanied by large or moderately large rotation. Applications. Johnson

290A. Topics in Nonlinear Oscillations. (3) Three hours of lecture per week. Prerequisites: 175 and 282. Markov and diffusion processes. Stochastic differential equations and applications. Equivalent linearization, perturbation, and Monte Carlo techniques. Recent developments in the nonlinear theory of random vibrations. Topics may change from year to year. Ma

290B. Topics in Continuum Mechanics. (2) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: 185. Selected topics from recent developments in linear and nonlinear theories of continuous mechanics, e.g., a general theory of oriented (or directed) media, nonlinear theory of diffusion, theory of electrodynamics and magnetized continua, anisotropic elasticity and viscoelasticity theories which bear on modern concepts of material behavior. Topics may change from year to year. Johnson

290C. Topics in Dynamic Games. (2) Two hours of lecture per week. Prerequisites: 271 or equivalent. Introduction to the theory of dynamic many player contests. A survey of different types of games, two person games, cooperative games. Applications to engineering, economics, bargaining, coalition avoidance, etc. Leitmann

290D. Physicochemical Fluid Dynamics: Fundamentals and Applications. (3) Three hours of lecture and one hour discussion per week. Prerequisites: Graduate Standing; 151 or Chemical Engineering 171; or consent of instructor. Introduction to the fundamental of mass, heat, mass and momentum transport in systems involving physicochemical forces. Derivation (and use) of conservation laws, constitutive equations and auxiliary relations to characterize (and predict) the behavior of industrial processes as well as biological and natural phenomena. Analysis of examples involving: multiple phases; interfacial phenomena; chemical reaction and non-Newtonian media. Hurmy

290F. Case Studies: In Fire Safety Engineering Science. (3) Three hours of lecture per week. Prerequisites: 151, 105. The fundamental physics and chemistry of fire are applied to case-study full-scale fires. Emphasis is on modeling the detailed fluid mechanics, heat transfer and combustion that have occurred in these examples. State of the art computer analysis is stressed. (F,SP) Pagni

290G. Kinetic Theory of Rarefied Gases. (2) Two hours of lecture per week. Introduction to the molecular theory of gases with emphasis on computer based Monte Carlo methods for flow simulation. Application to contemporary problems involving 1, 2, and 3 dimensions geometries and flows of gas mixtures will be discussed. (F) Hurburt


290N. Optimal Dynamical Design. (3) Three hours of lecture per week. Prerequisites: 107 or equivalent. Introduction to modeling, analysis, and intelligence and decision analysis in mechanical 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 fail- ures diagnostics. Use of automated influence diagrams to codify expert knowledge and to evaluate optimal design decisions. (F) Agogino

290P. Design Theory and Methodology. (3) Three hours of lecture per week. Prerequisites: 275 and 280 or equivalent. Introduction to modeling, analysis, and intelligence and decision analysis in mechanical 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 fails duistics. Use of automated influence diagrams to codify expert knowledge and to evaluate optimal design decisions. (F) Agogino

290Q. Dynamic Control of Robotic Manipulators. (3) Three hours of lecture per week for 5 weeks; 1 hour of lecture per week for 10 weeks; 4 hours of lab. 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 practical servo control. Applications of optimal linear quadratic control, preview control, nonlinear control, and direct/indirect adaptive control. Force control and compliance control. Collision avoidance. (F) Horowitz

290R. Automatic Control Laboratory. (2) One 1-hour lecture and three hours of laboratory per week. Prerequisites: 134. Applications of dynamic system modeling, system theory, and automatic control tech-
niques to mechanical, electro-mechanical, industrial, and other systems. Investigations include computer simulation and analog and digital feedback control.

298. Group Studies, Seminars, or Group Research. (1-8) Course may be repeated for credit. 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 studies of special problems, group participation in comprehensive design problems, or group research on concrete 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, physics, or mathematics. Investigate advanced problems in mechanical engineering. (F,SP) Staff

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

Professional Courses

301. Teaching of Mechanical Engineering At the University Level. (1-6) Course may be repeated for credit. One hour per week for 8 weeks. Must be taken on a satisfactory/unsatisfactory basis. Weekly seminars and discussions on effective teaching methods. Educational objectives. Theories of learning. The lecture and alternative approaches. Use of media resources. Student evaluation. Laboratory instruction. Curricula in mechanical engineering. Practice teaching. This course is open to Teaching Assistants of Mechanical Engineering. (F,SP) Staff

Medieval Studies

(College of Letters and Science)

Chair: Mary Kay Duggan, Ph.D.
Graduate Adviser: Suzanne Fleischman, Ph.D.

Medieval studies are currently undertaken in a joint degree program designed to preserve the established standards of training in a major subject, while broadening the student's experience in other aspects of the field. The degree granted in recognition of the student's achievement is the Ph.D. with a joint designation, for example, "Ph.D. in English and Medieval Studies." Each student is expected to fulfill the Ph.D. requirements of the major department of study, which administers the program of study. In addition, each student pursues seminar work in two outside departments, one of which is History (unless that is the department of the major). The student will consult with a special advisory group in the departments of Art and History of Art, Classics, Comparative Literature, Dramatic Art, English, French, German, History, Italian, School of Law, School of Library and Information Studies, Linguistics, Near Eastern Studies, Philosophy, Rhetoric, Romance Philology, Scandinavian, Slavic, South and Southeast Asian Studies, Spanish and Portuguese, and the Graduate Theological Union. An updated list of such offerings is issued each fall by the chair of the committee.

Upper Division Courses

150. Studies in Medieval Culture. (4) Course may be repeated for credit. Three 1-hour lectures and one 1-hour discussion per week. Taught by the Distinguished Visiting Professor for the current year on a topic related to his or her specialty. (SP) Frank

Graduate Courses

200. Introduction to Research Materials and Methods. (2) One 2-hour meeting per week; lecture & discussion. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. 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. (F) Staff

250. Seminar in Medieval Culture. (4) Course may be repeated for credit. One 3-hour lecture per week. Prerequisites: Graduate standing. Taught by the Distinguished Visiting Professor for the current year on a topic related to his or her specialty. (SP) Frank

Microbiology and Immunology

(College of Letters and Science)

The biological sciences at Berkeley were reorganized in July 1969. Consult staff in the Department of Molecular and Cell Biology for information on graduate and undergraduate programs in microbiology and immunology. Undergraduate students who declared the microbiology and immunology major before fall 1993 will be required to complete all upper division courses. Students who declared the microbiology and immunology major before fall 1989 may continue in the program. Taught by the Distinguished Professor for the current year on a topic related to his or her specialty. (SP) Frank

Upper Division Program

Students will choose at least one course in each of the following three groups, so as to provide a broad introduction to the geography and ethnography of the Middle East, its history and cultures, and current political, economic, and social development.

A. Anthropology
181, The Near East; Geography
166, The Arid Lands; Geography 167, The Middle East

B. History

Economics 172, Case Studies in Economic Development; Political Science 142A-142B, Middle East Politics.

Concentration. In addition to the interdisciplinary seminars, the student will pursue advanced studies, focusing on a particular region, discipline, or thematic problem relating to the Middle Eastern region. The program of advanced and more specialized study may be flexibly designed in consultation with the adviser to meet the interest of students and to create a coherent and integrated perspective on some aspect of Middle Eastern affairs. Courses in this part of the program may be selected from any of the courses in the catalog.

Courses in Middle Eastern Studies, available from the Center for Middle Eastern Studies, 372 Stephens Hall, or in the Group Major Office, 201 Moses Hall. The courses should be selected with a view toward developing an in-depth knowledge of a particular aspect of the subject. Specialized fields of study may include advanced language study, religious and cultural studies, history, contemporary trends in economic development and social change, urbanization, nation building, the impact of imperialism and colonialism on the Middle East, or any topic agreed upon between the student and the adviser. The student will take a minimum of four courses to meet the requirements of this part of the program. The courses selected may include those already taken to fulfill the upper division survey requirement. The following sample programs are given purely for illustrative purposes and do not indicate any requirements for the program.

Culture and Language

Advanced Arabic; Hebrew, Persian, or Turkish (beyond two years); Near Eastern Studies 150, Arabic Literature in Translation; Comparative Literature 120, The Biblical Tradition in Western Literature; Near Eastern Studies 121A-121B, Islamic Art; History 109A-109B, The Middle East.
Middle East Religions
Near Eastern Studies 140, Topics in Islamic Thought and Institutions; Near Eastern Studies 141, Modern and Contemporary Islamic Thought; Near Eastern Studies 142, Judaism and the Holocaust; Near Eastern Studies 133, Judaism in Late Antiquity; Near Eastern Studies 143A-143B, Islam in Iran.

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 156A, Politics and Anthropology; Anthropology 156B, Finland and Anthropology; Geography 130, Natural Resources and Population; Economics 171, Economic Development; Economics 181, International Economic Relations; Political Science 125A-125B, International Political Economy; Sociology 112, Sociology of Religion.

Senior Paper or Proseminar. Each major in the program will participate in a tutorial or proseminar with a faculty member of the program to do a research paper on a topic within the Middle Eastern area. Students must register for 1 unit of Middle Eastern Studies 190 for a letter grade.

Honors Program. Senior students with a grade-point average of 3.3 in the courses of the Group Major and in all work completed in the University will be eligible for an honors degree. The honors program will require, in addition to the normal requirements for the major, the preparation of a thesis based upon the senior paper and further research in Middle Eastern Studies (MES H195). The thesis will be supervised by a senior scholar appropriate to the student's interest and will be approved by the student's major adviser. Students must have completed MES 190 and must register for 1 unit of Middle Eastern Studies H195 for a letter grade.

Units. The program requires a minimum of 30 and a maximum of 36 upper division units.

Upper Division Courses

Military Affairs
Military Officers' Education Program (ROTC)
(Special Studies)
Office: See following listings for Aerospace Studies, Middle Science, and Naval Science.
Chair, Advisory Committee on ROTC: (To be announced)
Administrator: Andrew G. Jameson, Ph.D.
Adjunct Professors:
Patrick H. Corbett, Ph.D., Colonel, U.S. Air Force
Ronald A. Hellbuschi, M.S., Colonel, U.S. Army
Adjunct Associate Professor:
John C. Merritt, M.S., Commander, U.S. Navy
Adjunct Assistant Professors:
Scott B. Amoscoot, B.A., Lieutenant, U.S. Navy
Michael E. Finnie, U.M., Major, U.S. Marine Corps
Martin H. Rogers, M.S., Captain, U.S. Air Force
Craig M. Selubrede, B.S., Lieutenant, U.S. Navy
Ricard C. West, M.S., Captain, U.S. Army
Lecturers:
James D. Bacon, M.A., Major, U.S. Army
William B. Borinig, B.S., Lieutenant, U.S. Navy
Walter R. Mott, M.S.S.M, Captain, U.S. Army
Theodore Nyott, M.A., Major, U.S. Army
John J. Riley, B.S., Lieutenant, U.S. Navy
The Military Affairs Program comprises the three distinct military officers' commissioning programs: Air Force ROTC, Army ROTC, and Navy ROTC. The purpose of the program is to integrate the educational offerings of the separate military services into the regular University curricula. 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 must be members in any of the military services should consult the program advisers in the appropriate unit.

Military Division Courses
1. American Military Experience: Revolution to Vietnam. (3) Two 1-hour lectures and 1-hour discussion per week. Examine four general themes in the history of the military: the growth and development of the armed forces, the role of the military in civil-military relations, the elaboration and refinement of military technology, and the changes in military strategy. (F) Madison
2. The Military In American Society. (3) Two 1-hour lectures and 2-hour seminar per week. An introduction to the military profession, with emphasis on the relationship 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.
3. Defense Leadership and Management. (2) One 2-hour lecture per week. An analytical study of management schools, principles, and philosophies as a basis for developing effective leadership. Emphasis on behavioral science applications within the military organizational structure. Review of literature pertaining to power and authority, responsibility, motivation, communication, decision making, role theory, and professional ethics. (F,SP) Staff
4. Evolution of Warfare. (3) Three 1-hour lectures per week. A survey of warfare from the ancient world 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) Staff

Lower Division Courses
120. The Evolution of American Warfare: 1607-1900. (3) Two 1-hour lectures or one 3-hour lecture per week. Historical analysis of American warfare from colonial period to the period of the American Revolution and the Napoleonic Wars. (SP) Madison
124. War in Literature. (3) Three 1-hour lectures per week. Interdisciplinary exploration of novels and narratives of war as artifacts of our popular culture reflecting American attitudes toward war as both an institution and a personal experience. Traces four themes in particular: war as a rite of passage, the submarginal of the individual in modern mass society, the military as a subculture within American society, and America's role as self-styled defender of freedom. (SP) Staff
140. The North Atlantic Treaty Organization (NATO). (2) Two 1-hour lectures per week. Prerequisites: Upper division standing and consent of instructor. Theory and history of alliances; NATO's political and military structure; operating methods; military forces and strategy; Soviet response to NATO; and strategic and political options, will be examined. Arms control, nuclear proliferation, special regional concerns, and factors for change in the 1980's will also be considered.
144. Military Law, Ethics, and Professionalism. (2) Two 1-hour lectures per week. Topics to be analyzed and discussed include the court-martial system, the purpose and use of the Uniform Code of Military Justice, fundamental rights of accused persons, rules of evidence, punishment, administrative boards, and the
145A-145B. National Security Forces in Contemporary American Society. (3) Two 1 1/2-hour pre-seminar meetings per week. Prerequisites: Upper division standing and consent of instructor. 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,SP)

154. The History of Littoral Warfare. (3) Two 1 1/2-hour lectures per week. An analysis of the theory, origins, historical evolution, and impact of man's attempts to project seapower ashore. A case study approach is used to study developments in amphibious warfare. (F) Finnie

**170. Comparative Military Systems: The Third World. (3) Two 1-hour lectures and one 1-hour discussion per week. Concentrates on the paradigms for analyzing internal conflict, the role of the military in the state, and external influences of the advanced states on developing countries. Special emphasis will be given to the evolution of national military regimes, their impact on the socio-political development of the target country, and the cause of the coup d'etat.**

**171. Comparative Military Systems: USSR, PRC, and Western Europe. (3) Two 1-hour lecture and one 1-hour discussion per week. Comparative analysis of the current Sino-Soviet and selected Middle Eastern military systems as they relate to the socio-political organization of these countries. Special emphasis is on discussions of development of their decision making and command structures and the relationships of the military with their domestic and international environment.**

186. Supervised Independent Study and Research. (1-4) May be repeated for credit. Individual conferences to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Supervised independent study and research for undergraduate students who desire to pursue topics of their own selection. (F,SP)

Aerospace Studies (Air Force ROTC)

Department Office: 10 Callaghan Hall, 642-3572

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 while simultaneously completing university graduate and undergraduate degree requirements. Two accredited AFROTC programs are available: Aerospace Science and Military Affairs, The Growth and Development of Air Power. (1) One 1/2-hour lecture/discussion per week. Prerequisites: Consent of instructor. Traces the historical evolution of air power, its concepts, strategies, theories, and applications. Emphasizes the impact of changing technological and the contribution of specific individuals to the figures on the growth and development of air power. (SP) Staff

Upper Division Courses

**135A-135B. Aerospace Management and Leadership. (3-3) Two 1-hour pre-seminar meetings per week. Prerequisites: Upper division standing and consent of instructor. A study of contemporary management practices. Includes study of individual and group dynamics, and the theories of management, systematic decision-making, the communication process, case analysis, leadership theories, managerial ethics, personnel administration, and the organizational environment. Staff.**

Professional Courses

442. Light Aircraft Operation. (2) Two 1-hour lectures per week. Prerequisites: Consent of instructor. Preparation for qualification as Federally Licensed Private Pilot. Study of federal aviation regulations, basic meteorology for pilots, navigation by dead reckoning and piloting, radio and radio navigation, elementary aerodynamics and aircraft structures. (SP) Merril

Military Science (Army ROTC)

Department Office: 73 Harmon Gymnasium, 642-3374

The Army Officer Education Program offers a variety of credit courses of general interest focused on the study of the military as a social 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. Students may complete their commission in the Regular Army, Army Reserve, or National Guard.

Graduate or undergraduate students can complete the Military Science requirements through a four-year, two-year, or three-year program. The four-year and three-year programs involve the basic and advanced courses; the two-year program involves only the advanced course.

1. The basic course is designed for students who are unsure of their interest in the military and in whose case service obligation. Purposes is to expose the student to the Army while concurrently developing leadership skills applicable to both civil- and military environments.

2. The advanced course is designed for students who expect to receive their commissions and go on active duty. Normally, upper division students may participate in the AFROTC 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 73 Harmon Gymnasium or call (415) 642-3374.

**Military Officers' Education Program (ROTC) / 253**

*Not offered 1991-92
*On leave, spring
*On leave, fall

*On leave, spring
*Recipient of Distinguished Teaching Award
one field trip. Theoretical and historical analysis of human adaptability to hostile environments. Survival in desert, mountain, jungle, and arctic environments is analyzed.

Upper Division Courses

100. Army Management and Leadership. (2) One 2-hour lecture/discussion per week. Prerequisites: Upper division standing and consent of instructor. A practical introduction to modern military strategy 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. (SP West

Professional Courses

430. Fundamentals of Terrain Representation and Military Operations. (3) One 3-hour lecture per week and one 1-hour laboratory per week. Introduction to topographic maps and aerial photographs and their relation to land navigation. Conceptual linkage to basic military tactics. Topics include map coordination systems, scale and distance relationships, intersection and resection, photo interpretation, squad and platoon operations, and the use of resource planning techniques. (F) West

Naval Science (Navy ROTC)

Department Office: 25 Callaghan Hall, 642-3851

The Department of Naval Science offers several programs of instruction for men and women leading to regular or reserve 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 Navy ROTC programs will normally complete the following courses during their first two years as part of their overall academic load: MA 1, NS 1, NS 2, NS 12A, and an approved course in the area of leadership and management.

Navy Option students enrolled in either the four-year or two-year program will normally complete the following courses during their junior and senior years: NS 12B, NA 10, NS 401, and NS 412. Marine Option students will participate in a marine seminar and complete a sequence in the History of Littoral Warfare (MA 154) and the Evolution of Amphibious Warfare. All Navy Option scholarship students must complete one year of calculus and one year of calculus-based physics by the end of their sophomore and junior years respectively.

Students are also required to attend weekly professional development laboratories. These two-hour sessions offer the student midshipman an active role in the management and direction of the midshipman battalion and provide preparation for the midshipman to explore professional topics. Students midshipman also attend four to six week summer training cruises throughout the world. At sea they apply theoretical aspects of their education and training to the real world environment of a Navy ship.

Currently, there are four programs available:

1. NROTC Three-and-Four-Year Scholarship Program: Nationwide competition is open to physically qualified men and women between the ages of 17 and 21 with waivers available for prior active duty to maximum commissioning year age of 29. U.S. citizenship is required. High school juniors and seniors and college freshmen are eligible to apply. Successful applicants receive full payment of tuition, fees, and $100 per month during their last two years in college. One summer training cruise is required. Upon graduation, the student receives a commission in the Regular Navy or Marine Corps with a four-year active duty obligation. (Obligated service is not incurred until the start of the sophomore year in the four-year scholarship program.) Application deadline is December 1.

2. NROTC Four-Year College Program: Open to physically qualified men and women between the ages of 17 and 21 with the active duty waiver as above possible. U.S. citizenship is required prior to start of junior year. College students may enroll in the college program until the start of their junior year. Upon graduation, the student receives a commission in the Naval Science Institute, receive uniform, naval science books, and $100 per month stipend in their junior and senior years. They complete one summer training cruise after their junior year. Upon graduation, the student is obligated to serve in the Naval or Marine Corps Reserve with a three-year active duty obligation. (Obligated service is not incurred until the start of the junior year in the four-year college program. Students may be required to attend a college program for professional training. (SP) West

3. NROTC Two-Year Scholarship Program: Nationwide competition open to academically and 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 26th birthday before June 30 of the year in which they are commissioned. Waivers to age 29, however, are possible for prior service. Candidates for the two-year scholarship program attend a six-week summer training period at the Naval College of Science, Newport, Rhode Island, during the summer before their junior year. Graduates of the Naval Science Institute will receive full payment of tuition, fees, books, and $100 per month during their last two years in college. One summer training cruise is required. Upon graduation, the student receives a commission in the Regular Navy or Marine Corps with a four-year active duty obligation. Application deadline is normally March 1 of the academic year.

4. NROTC Two-Year College Program: Open to physically and academically qualified men and women who will be entering their junior year of undergraduate study (or their third year in a five-year curriculum). The age limit is 27 1/2 at the time of graduation, with the same active duty waiver as above. U.S. citizenship is required. Candidates attend the Naval Science Institute in Newport, Rhode Island, during the summer before their junior year. Graduates of Naval Science Institute will receive uniform, naval science books, and $100 per month stipend in their last two years in college. One summer training cruise is required. Upon graduation, the student receives a commission in the Naval or Marine Corps Reserve with a three-year active duty obligation. Application deadline is normally March 15 of the academic year.

For further information, direct inquiries to the chair of Naval Science, 25 Callaghan Hall.

Lower Division Courses

1. Introduction to Naval Science. Two hours of lecture and discussion per week. Must be taken on a passed/not passed basis. Emphasis is placed on professional training not of an academic nature. The laboratory is intended for topics such as drill and ceremonies, physical fitness and swimming testing, cruise preparation, crew evaluation, sail training, safety awareness, preparation for commissioning, personal finances, insurance, and applied exercises in naval ship systems, navigation, naval operations, naval administration, and military justice. Other topics and special briefings will be conducted as determined by the Chief of Naval Education and Training or the professor of naval science. (F,SP) West

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 study of naval power and the historical, social, and national interest in development of sea power. Includes study of the role of sea power in international affairs, sea power and national security, sea power and international politics, and sea power and national identity. (SP) Heilsbusch

12A. Navigation and Naval Operations I. (3) Three hours of lecture and one hour laboratory per week. Theory, principles, and procedures of terrestrial and celestial navigation, and piloting techniques. A study of coordinating systems, including the celestial coordinate system, nautical charts and publications, position fixing, dead reckoning, nautical astronomy, the theory and methods of celestial navigation, and the theory and prediction of tides and current. (F) Staff

12B. Navigation and Naval Operations II. (3) Three hours of lecture and one hour laboratory per week. Prerequisites: 12A or consent of instructor. Introduction to the various aspects of ship operations at sea. Principles of terrestrial navigation including the rules of the road for prevention of collisions at sea, vector analysis of relative motion, ship behavior and characteristics in maneuvering, precise ship positioning, use of aids to navigation, meteorology, and electronic navigation. (F) Armacost

Professional Courses

400A-400H. Naval Laboratory. Two hours of instructor and practical application in leadership and associated military skills. Must be taken on a passed/not passed basis. Emphasis is placed on professional training not of an academic nature. The laboratory is intended for topics such as drill and ceremonies, physical fitness and swimming testing, cruise preparation, crew evaluation, sail training, safety awareness, preparation for commissioning, personal finances, insurance, and applied exercises in naval ship systems, navigation, naval operations, naval administration, and military justice. Other topics and special briefings will be conducted as determined by the Chief of Naval Education and Training or the professor of naval science. (F,SP) Staff

401. Naval Ship's Systems. (3) Three hours of lecture per week. An introduction to the physical theory or 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 objects sharing and traversing common environments. (F,SP) West

411. Leadership and Management I. Two hours of lecture and discussion per week. Must be taken on a passed/not passed basis. A comprehensive advanced-level study of organizational behavior and management. Prerequisites: Consent of instructor. Topics include a survey of the management functions of planning, organizing, and controlling; an introduction to individual and group behavior in organizations; and an examination of major major behavioral theories are explored in detail. Practical applications are explored by the use of experiential exercises, case studies, and laboratory discussions.

412. Leadership and Management II. Two hours of lecture and discussion per week. Must be taken on a passed/not passed basis. The study of naval officer responsibilities in naval administration. The course covers counseling methods, military justice administration, naval human resources management, directives and correspondence, naval personal administration, material management and maintenance, and supply systems. This capstone course in the NROTC curriculum builds on and integrates the professional competencies and skills developed in prior course work and professional training. (SP) Heilsbusch
Molecular and Cell Biology
(College of Letters and Science)

Department Office: 597 Life Sciences Addition
Chair: Gunther S. Stent, Ph.D.

Division of Biochemistry and Molecular Biology: 121 Genetics and Plant Biology Building, 643-6451
Biochemistry and Cell Biology: 103 Donner Laboratory, 642-4131
Cell and Molecular Biology: 299 Life Sciences Addition, 642-3953

Genetics: 121 Genetics and Plant Biology Building, 642-5266

Professors:
James Allison, Ph.D. University of Texas. Immunology
Edward Altmann, Ph.D. University of California at Berkeley. Developmental biology
Bruce N. Ames, Ph.D. California Institute of Technology. Molecular biology, biochemistry, carcinogenesis
Giovanna Ferro-Luzzi Ames, Doctor of Biologia, University of Florence. Molecular biology, membranes
Cline E. Ballou, Ph.D. Wisconsin University. Carbohydrates, lipids, cell walls
Alberto Barberis, Ph.D. University of California at Los Angeles. Physics of energy transduction, auditory biology
Steven K. Beckand, Ph.D. California Institute of Technology. Cell biology
David R. Bentley, Ph.D. University of Michigan. Molecular biology, immunology
Phyllis B. Blair, Ph.D. University of California at Berkeley. Developmental biology, cell and molecular biology
Michael R. Bitchcan, Ph.D. University of California at Berkeley. Eukaryotic gene expression
Harald Brem, Ph.D. University of Auerster. Theoretical biology, mathematics
Beth Burnside, Ph.D. University of Texas, Austin. Cell motility, photoreceptor physiology
Richard C. Brum, Ph.D. Stanford University. Molecular genetics of viruses
W. Zacheus Cande, Ph.D. Stanford University. Cell and development of C. elegans
Charles R. Cantor, Ph.D. University of California at Berkeley. Membrane proteins, structural biology
Michael J. Chamberlin, Ph.D. Stanford University. Nucleic acids, gene expression
Alvin J. Clark, Ph.D. Harvard University. Microbial genetics
Thomas W. Cline, Ph.D. University of Harvard. Sex hormones, drug action
Nicholas R. Cozzarelli, Ph.D. Harvard Medical School. DNA replication and recombination
Peter H. Duesberg, Ph.D. University of Frankfurt. Genetic structure of retroviruses
Harrison Echols, Ph.D. University of Wisconsin. Molecular genetics of viruses
John Forte, Ph.D. University of Pennsylvania. Membrane proteins, transport and energetics
Wayne E. Frank, Ph.D. University of California at Berkeley. Neurophysiology, neurochemistry, nonlinear brain dynamics
James W. Fratini, Ph.D. Rockefeller University. Cell biology
John Gerhart, Ph.D. University of California at Berkeley. Developmental biology
Robert M. Glaeser, Ph.D. University of California at Berkeley. Membranes, protein structure and function
Michael A. Green, Ph.D. Stanford University. Developmental biology
Donald A. Glaeser, Ph.D. California Institute of Technology. Psychophysics of vision, biotechnology
Alexander H. Glazer, Ph.D. University of Utah. Macromolecular complexes, photosynthetic systems
Coney Goodman, Ph.D. University of California at Berkeley. Developmental neurobiology, molecular genetics
Raymond Keller, Ph.D. University of Illinois at Urbana-Champaign. Developmental biology
Jack F. Kirsch, Ph.D. Rockefeller University. Enzymology, nutrition
Marian E. Koshland, Ph.D. University of Chicago. Molecular biology
Sydney G. Kustu, Ph.D. University of California at Davis. Developmental biology, John Hopkins and activity
Harold Lee, Ph.D. Columbia University. Neuronal injury, excitability of membranes
Terrence Leth-Larsen, Ph.D. University of British Columbia. Microbial molecular genetics
Shawn L. Linehan, Ph.D. Georgia Institute of Technology. Enzymology of DNA metabolism
Robert J. Macey, Ph.D. University of Chicago. Membrane transport, red cells
Terry M. Machen, Ph.D. University of California at Los Angeles. Developmental biology, extracellular and membrane biology
Glenn G. Martin, Ph.D. University of Cambridge. Cell biology, tumor virology
Harold Mel, Ph.D. University of California at Berkeley. Cell membrane biophysics, thermodynamics
Barbara J. Meyer, Ph.D. Harvard University. Sex determination in C. elegans
Sheldon S. Miller, Ph.D. University of Michigan. Membrane biophysics, electrophysiology
Robert I. Mishel, M.D. Stanford University. Cell biology, immunology, immunoregulatory mediators

Robert K. Mortimer, Ph.D. University of California at Berkeley. Yeast genetics, DNA repair
Sagayaraman Natrajan, Ph.D. University of California at Berkeley. Tumor biology and endocrinology
J.B. Nellans, Wisconsin University. Iron metabolism
Alexander V. Nichols, Ph.D. University of California at Berkeley. Macromolecular biophysics, viral pathology
Hirotshi Nakano, M.D., Ph.D. Medical School. Membrane structure, bacterial physiology
George F. Oster, Ph.D. University of California at Berkeley. Mathematical biology
W. Geoffrey Owen, Ph.D. Imperial College, London. Membrane biophysics, retinal neurophysiology
Lester Packard, Ph.D. Yale University. Biological oxidations and bioenergetics
Jesse C. Rabkin, Ph.D. University of Wisconsin. Enzymology, metabolism
Takashi Riechert, Ph.D. University of Oregon. Gene regulation, cell biology
Gerard M. Ruben, Ph.D. University of Cambridge. Molecular biology
John Gernart, Ph.D. University of California at Berkeley. Membrane biophysics, biophysics
Lester Packard, Ph.D. University of California at Berkeley. Cell biology
Jeremy Thormey, Ph.D. Harvard University. Biochemistry, molecular genetics, cell biology
Paul S. Timiras, M.D., Ph.D. University of Rome; University of Montreal. Neuroendocrinology of development and aging
Robert F. Tjian, Ph.D. Harvard University. Eukaryotic molecular biology
Frank S. Werbin, Ph.D. Johns Hopkins University. Neurophysiology, biochemistry
Neuroscience, and developmental genetics
Robert S. Zucker, Ph.D. University of California at Berkeley. Neurophysiology, synaptic biology
David Zusman, Ph.D. University of Colorado at Boulder. Cell biology, cellular biology

Jeffrey A. Winer, Ph.D. University of Tennessee. Neuroanatomy, comparative neurobiology, neuroendocrinology
Cassandra Smith, Ph.D. (in residence). Texas A & M University. Neurobiology
Patricia St. Lawrence, Ph.D. (Emeritus) Columbia University. Gene regulation and signaling

Assistant Professors:
David G. Drubin, Ph.D. University of California at San Francisco. Cytoskeleton and regulation of cell cycle
Robert M. Hwang, Ph.D. University of California at Berkeley. Molecular biology of development
Hillary Nelson, Ph.D. Massachusetts Institute of Technology. X-ray crystallography

Adjunct Professor:
Thomas L. Hayes, Ph.D. University of California at Berkeley. Scanning electron microscopy, X-ray microscopy

Associate Adjunct Professor:
Edward E. Poon, M.D. University of Washington, Seattle. Macromolecular synthesis control mechanisms and the biology of RNA viruses

Assistant Adjunct Professors:
Marietta Dayanaw, Ph.D. Rice University. Eukaryotic gene expression
Gwen A. Jacobs, Ph.D. State University of New York. Neurobiology of interneurons
Caroline M. Kana, Ph.D. University of California at Berkeley. Gene regulation, biochemistry

Senior Lecturers:
Anne H. Good, M.D. Yale University. Cell biology, immunology

Major Advisors for the Plans and their emphases:
Plan I. Biochemistry and Molecular Biology: Dr. Kirsch; Genetics: Dr. Clark; Immunology: Dr. Zusman
Plan II. Cell Physiology: Dr. Macey; Cell and Developmental Biology: Dr. Firestone; Neurobiology: Dr. Freeman

Undergraduate Programs
The teaching and research activities of the Department of Molecular and Cell Biology concern the molecular structures and processes of cellular life and their roles in the function, reproduction, and development of living organisms. This agenda covers a broad range of specialized disciplines, such as biochemistry, biophysics, molecular biology, genetics, cell biology, cell anatomy, immunology, and neurobiology, from which the departmental faculty draws its working materials are as diverse as its disciplinary specializations, ranging from viruses and microbes through plants, roundworms, nematodes, arthropods, and mollusks to fish, amphibia, and mammals. The faculty of the department is organized into six divisions, called Biochemistry and Molecular Biology, Biophysics and Cell Physiology, Cell and Developmental Biology, Genetics, and Neurobiology. Each division is responsible for the course list and plan of the undergraduate major program, serving its disciplinary specialty. The departmental graduate program is administered by the interdivisional Graduate Affairs Committee.

The Major
The undergraduate major in molecular and cell biology replaces the previously offered majors in biochemistry; biological sciences (Plan A, Option 1); biophysics; medical physics option; genetics (A.B. and B.S.); microbiology and immunology (Plan I);
molecular biology; neurobiology; physiology; and zoology.

**Plan I.** (Emphasis 1: Biochemistry and Molecular Biology; Emphasis 2: Genetics; Emphasis 3: Immunology; Emphasis 4: Microbiology)

**Lower Division.** Chemistry 1A-1B (8); Chemistry 8A-8B (7); Biology 1A-1B (8); Mathematics 1A-1B (8); Physics 8A-8B (8); (emphasis in Biochemistry and Molecular Biology) Chemistry 112A-112B recommended instead of Chemistry 8A-8B. Lower division courses: Biochemistry and molecular biology or 39 (genetics, or immunology, or microbiology).

**Upper Division.** Chemistry 130A (3), Chemistry 130B (3); recommended: MCB 100 (4), MCB 110 (4), MCB 140 (4); (emphasis in Biochemistry and Molecular Biology) MCB 110L (5) and one additional upper division MCB course, MCB 119 (1) recommended; or (emphasis in Genetics) MCB 140L (4) and one additional upper division MCB course; or (emphasis in Immunology) MCB 193 (4) and MCB 150L (4); or (emphasis in Microbiology) MCB 112L (4) and MCB 112L (4). Upper division units: 21-24.

Total Units: 64-66 (biochemistry and molecular biology); or 80-83 (genetics, or immunology, or microbiology).

**Plan II.** (Emphasis 1: Cell Physiology; Emphasis 2: Cell and Developmental Biology; Emphasis 3: Neurobiology)

**Lower Division.** Chemistry 1A-1B (8); Biology 1A-1B (8); Mathematics 1A-1B (8); Chemistry 8A-8B (7); Physics 8A-8B (8). Lower division units: 39.

**Upper Division.** Physical Chemistry (3); MCB 102 (4); MCB 130L-130M (4) (emphasis in Cell Physiology), MCB 120L (4), MCB 120L (4); (emphasis in Cell and Developmental Biology) MCB 130L (4), and two additional upper division MCB courses, one (emphasis in Neurobiology) MCB 112L (4), MCB 160L (3) and one additional course chosen from MCB 162 (3), MCB 163 (3), MCB 164 (3), and MCB 165 (3). Upper division units: 24-25.

Total units: 83-84.

**Plan III.** (Emphasis in Biophysics)

**Lower Division.** Chemistry 1A-1B (8); Biology 1A (4); Mathematics 1A-1B (8); Mathematics 50A-50B (8); Physics 7A-7B-7C (12); Chemistry 8A-8B (7); Chemistry 9A-9B (7); Chemistry 9B-9C (7); Chemistry 9C-9D (7); lower division units: 24.

**Upper Division.** MCB 102 (4); MCB 122L (4); MCB 122L (4); and two upper division MCB courses, or one of the following physics course sequences: 110A-110B (8), 105-112 (8), or 137A-137B (8). Upper division units: 20.

Total units: 70.

**Honors Program.** No later than the beginning of their senior year, students may enroll in the honors program, for which consent of their major adviser and a grade-point average of 3.3 or higher in courses satisfying the requirements of any plan of the major and in all courses taken in the University is required. Certain graduate courses in molecular and cell biology will be open to honors students on approval of the instructor and the major adviser. To complete the honors program and to graduate with honors, students must complete at least 6 units of course H196 and one unit of course H190 and write a superior thesis based on research.

**Graduate Program.** The department offers a graduate program of 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 well-focused, but at the same time offers unusually wide opportunities for varied disciplinary specialization. Undergraduate preparation for admission to the program should correspond to one of the three plans of the departmental undergraduate major detailed above. All students working for the Ph.D. are required to serve as a graduate student instructor during some part of their career in the program. Students seeking detailed information about the program, regarding such matters as admission, curriculum, and sources of financial support, should contact the departmental Graduate Affairs Office.

### Research Facilities

The Robert D. Ogg Electron Microscope Laboratory is an instructional and research unit of the College of Letters and Science. It houses equipment for transmission 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 sample preparation. Qualified undergraduates and graduate students, postdoctoral associates, faculty, and research staff in biological and physical sciences, once trained, may make arrangements for 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 research work. With permission from the director, non-UC personnel may be accepted for training or laboratory use. Equipment can be used outside normal hours. The laboratory provides demonstrations of the electron microscope and preparative techniques for on-campus classes and may make special arrangements for tour groups.

**Division of Biochemistry and Molecular Biology**

**Head:** Randy Schechman

**Lower Division Courses**

11. Of Molecules and Man: A View for the Layman. (3) Two 1½-hour lectures and one hour of discussion per week. Examination of molecular mechanisms that underlie normal functions of living organisms and ways those functions are disrupted by medical disorders and manipulations and responsible agents. Designed to provide non-biologists with an understanding of modern biochemistry and the ways we control and alter the biology of our life and faculty. (SP) Fain, Blain, Blain

12. The Microscopic World. (3) Students who have received credit for 51 or 52 will receive only two units for 12. Two 2-hour lectures per week. Must be taken on a pass/fail/odd pass basis. High school chemistry or Chemistry 1A, high school biology or Biology 1A. Formerly Microbiology and Immunology 10. An introduction to the biology of microorganisms and the immune system; the fundamental principles of and major advances in microbiology and immunology; intended for students not majoring in a biological science. (F) Blair, Grinthal

*Introduction to Molecular Biology, (3) Two 1½-hour lectures and 1-hour discussion per week. Formerly Molecular Biology 10. Designed for students not majoring in the life sciences. Contemplation of the historical background of molecular biology. (SP) Bird, Grinthal

14. Enology—The Microbiology and Biochemistry of Wine. Two 1½-hour lectures per week. Prerequisites: High school biology and high school chemistry. Formerly Microbiology and Immunology 2. The microbial, ecological, biochemical, physiological, and genetic features of wine and the physical and chemical properties produced throughout the world. Microbiological and biochemical factors affecting wine quality will also be discussed. (SP) Leighton

### Upper Division Courses

100. General Biochemistry. (4) Three 1-hour lectures and one 1-hour section meeting per week. Prerequisites: Biology 1A, Chemistry 8B or equivalent and a course in physical chemistry. Formerly Biochemistry 100A. A comprehensive survey of the fundamentals of biochemistry, including the structure and function of biological macromolecules, the logic of metabolic pathways (both degradative and biosynthetic) and the molecular basis of genetic and gene expression. (F,SP) Staff

102L. Biochemistry Laboratory. (4) Two 1-hour lectures and two 3-hour laboratory periods per week. Prerequisites: Chemistry 8B or equivalent (may be taken concurrently). Formerly Biochemistry 102L. Experimental work to acquaint students with the properties of biological materials, the action of enzymes, and the use of specific techniques for laboratory work in biochemistry. Planned to accompany lecture in 102. (F) Ballou, Niellands

110. General Biochemistry and Molecular Biology. (4) Three 1-hour lectures and one 1-hour section meeting per week. Prerequisites: 100 (may not be taken concurrently). Formerly Biochemistry 100B. Molecular Biology 100A-100B. Molecular Biology of prokaryotic and eukaryotic cells and their viruses. Mechanisms of DNA replication, transcription, translation. Structure of genes and chromosomes. Regulation of gene expression. (F,SP) Staff

110L. General Biochemistry and Molecular Biology Laboratory. (5) Three 1-hour laboratories and three 3-hour laboratories per week. Prerequisites: 110 (may be taken concurrently); Chemistry 5. Formerly Biochemistry 101L. Molecular Biology 101. Experimental techniques of biochemistry and molecular biology, designed to accompany lecture in 100 and 110. (F,SP) Staff

112. General Microbiology. (4) Three 1-hour lectures and one 1-hour section meeting per week. Prerequisites: Biology 1A, 102. Formerly Microbiology and Immunology 100, 101. A survey of general microbiology which introduces the methodology of microbiology and stresses the basic biological properties of microorganisms, and prokaryotic cells in particular, including their growth, physiological diversity, structure, and ecology. (F) Kuester, Leighton

112L. Microbiology Laboratory. (4) One 1-hour lecture and four 4-hour laboratory periods per week. Prerequisites: 112 (may be taken concurrently); 100L, 101L. Experimental work, designed to accompany course 112, which acquaints the student with the isolation of bacteria from natural habitats, methods of culture, microscopic observation, the structural and physiological features of microbial cells, and their molecular genetics. (F) Zuzman

113. Applied Microbiology and Microbiology. (2) Two 1-hour lectures/discussion per week. Prerequisites: Consent of instructor. Formerly Microbiology and Immunology 104. A survey of modern developments emphasizing the application of the knowledge of fundamental microbiology to industrial processes. Topics include fermentation of metabolites by yeasts and single-cell proteins; genetic manipulation of microorganisms; recovery of minerals; and energy production. (SP) Glazer, Mikado
114. Introduction to Comparative Virology. (3) Three 1-hour lectures per week. Prerequisites: Chemistry 11 and Biology 112. Formerly Molecular Biology 120 and Biology 120. The chemical, physical, and hereditary characteristics of viruses as infectious agents. (SP) Volkman

**117. Topics in Biochemistry and Molecular Biology.** (1-3) Course may be repeated for credit. One, two, or three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 195, Molecular Biology 198. Topics of current and general interest in some specialized domain of molecular and cell biology. (SP) Staff

Graduate Courses

200. Advanced Biochemistry and Molecular Biology. (3) Two 1½-hour lectures and 1-hour discussion per week. Prerequisites: 110 or equivalent. Formerly Molecular Biology 200A-200G General course for first-year graduate students. Recent advances in the study of structure, functional, and genetic characteristics of prokaryotic and eukaryotic cells and their viruses, macromolecular syntheses, regulation of gene expression, cell organization, and cell differentiation. (F) Cozzarelli, Botchan, Harland

201A-201C. Advanced Biochemistry and Molecular Biology Laboratory Strategies. (1; 1; 1) Three 1-hour lectures per week. Prerequisites: Graduate standing. Recent advances in molecular biology. (F) Ranish, Botchan, Harland

203. Structure and Function of Eukaryotic Cellular Membranes. (2) Two 1-hour lectures per week. Prerequisites: Year courses in organic and general chemistry, and introductory biology. Structure, function, and function of the cell surface in various cell cycle events. (SP) Schekman

205. Biochemistry of Nucleic Acids. (3) Two 1½-hour lectures and one hour discussion per week. Pre requisites: 110 or equivalent. Formerly Biochemistry 205 The chemistry and biochemistry of nucleic acids and their constituents. (SP) Chamberlin

206. Physical Biochemistry. (3) Two 1½-hour lectures per week. Prerequisites: Year courses in organic chemistry and physical chemistry. 100 recommended. Formerly Biochemistry 206 Application of modern physical concepts and experimental methods to the analysis of the structure, function, and interaction of large biological molecules. (F,SP) Schachman

**207. Comparative Biochemistry.** (1) One 1-hour lecture per week. Prerequisites: 100. Formerly Biochemistry 207 Contributions of comparative biochemistry to knowledge of the molecular basis for organismal diversity, the mechanism of evolution, and the functioning of biological systems. (F,SP) Chamberlin

208. Regulation of Gene Expression. (3) Two 1½-hour lectures and one hour discussion per week. Prerequisites: 110 or equivalent; 140. Formerly Biochemistry 208 Regulation of genes at the biochemical and molecular levels. Transcription, post-transcription, and translation. Initiation and regulation of transcription and RNA processing; recombination, transformation, transposition; gene regulation in viruses, microorganisms, and higher eukaryotes. (F) Thorne, Echols, Tjian, M. Kosholand

216. Structure and Function of the Prokaryotic Cell. (2) Two 1-hour lectures per week. Prerequisites: 100 or 112, or equivalent. Formerly Microbiology and Immunology 206 Structure and function of prokaryotic cells. Prerequisites: Consent of instructor. (SP) Duesberg, Penhoet, Botchan

217. Selected Topics in Biochemistry and Molecular Biology. (3) Course may be repeated for credit. One to 1½ hours of lecture per week. Prerequisites: Consent of instructor. Review of current literature and discussion of original research. (SP, F) Cozzarelli, Calabrese

218A. Bacterial Viruses. (2) May be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Molecular Biology 232. Initiation and regulation of transcription, and the expression of virion genes. (SP) Kisch, Leighton, Calabrese

218B. Molecular and Developmental Genetics of Bacillus subtilis. (2) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: Consent of instructor. Formerly Molecular Biology 249. Genetic and molecular studies of Bacillus subtilis. (F,SP) Smith

218C. Malignant Transformation. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Malignant transformation by retroviruses and the role of protein phosphorylation in growth regulation. (F,SP) Martin

218D. DNA Structure and Function. (2) One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Molecular Biology 220. DNA structure and function. (F,SP) Cozzarelli, Harland

218E. Viruses as Models for Eukaryote Gene Expression and Replication. (2) Two 1-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Molecular Biology 208. Recent developments in eukaryotic cellular and viral regulation. New concepts in transcription and RNA replication, with particular emphasis upon virus-cell interactions. (F,SP) Botchan

218F. Large DNA Molecules. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Methods for manipulating chromosome-sized DNA molecules for study of processes of molecular and cellular biology. (F,SP) Chait, Smith

218G. Myxobacterial Development. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Molecular Biology 287. Structure, functional properties, and assembly of proton channels, as well as active transport apparatus, in bacterial membranes. (SP) Wilson

219M. Structure, Function and Design of Nucleic Acid Binding Proteins. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Structure, functional properties, and assembly of proteins that form nonproteic and specific passive diffusion channels, as well as active transport apparatus, in bacterial membranes. (SP) Wilson

219N. Enzyme Mechanisms. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 244. Protein-DNA interactions and the control of gene expression in eukaryotes. (F,SP) Tjian

219D. DNA Enzymology. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 260. Enzymology of DNA repair, replication, recombination, and methylation. (F,SP) Lin

219E. Regulation of Gene Transcription. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 242. The mechanism of regulation of gene function, primarily at the level of genetic transcription. (F,SP) Chamberlin

219F. Eukaryotic Gene Expression. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 245. Protein-DNA interactions and the control of gene expression in eukaryotes. (F,SP) Tjian

219G. Mutagen Detection. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 245. Mutagenesis and carcinogenesis. (F,SP) B. Ames

219H. Chromosomal Structure. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 246. Proteins involved in the structure and dynamics of chromosomes. (F,SP) Cole

219J. Evolution and Speciation. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 246. Evolution and speciation. (F,SP) Doolittle

219K. Microbial Protein Synthesis and Regulation of One-carbon Metabolism. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 248. Protein synthesis and regulation of one-carbon metabolism. (F,SP) Doolittle

*On leave, spring
**Recalled to active service
†Recipient of Distinguished Teaching Award
251. Micrornal protein synthesis and regulation of one-carbon metabolism. (F,SP) Rabizowitz

219M. Regulatory Substances in Bacteria. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 254. Bacterial regulation. (F,SP) B. Ames

219N. Chemotaxis. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 255. Bacterial chemotaxis as a model sensory system. (F,SP) Kostland

219P. Secretion and Cell Membrane Assembly. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 258. Special emphasis on transport of amino acids and protein across cell membranes. (F,SP) F. Ames

219T. Peptide Hormone Biosynthesis and Eukaryotic Cell Division. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 259. Synthesis and processing of peptide hormone precursors; biochemical basis of cellular growth control, and molecular mechanisms of cell type-specific gene expression, with emphasis on the yeast Saccharomyces cerevisiae. (F,SP) Schekman

219U. Microbial Iron Metabolism. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 270. Microbial iron metabolism. (F,SP) Neidleman

219W. Cyanobacterial Physiology and Biochemistry. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 272. The physiology, cell structure, biochemistry, and molecular biology of the cyanobacteria (blue-green algae). (F,SP) Glaazer

Division of Biophysics and Cell Physiology

Head: Robert M. Glaesser

Lower Division Courses

21. The Physics of Life. (2) Three hours of lecture discussion per week. A survey of biological phenomena in the understanding of which the concepts and methods of physics have played an essential role: atomic and molecular structures of nucleic acids and enzymes; enzyme action at the level of atomic resolution; conduction of neural impulses and ion channel molecules; signal processing in the sensory systems; computation in the nervous system. (F)

22. Origin and Early Evolution of Life. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: High school biology and physics or chemistry. Formerly Biophysics 12. Formation and evolution of the universe; chemical and physical conditions of early solar system; origin of life; search for life beyond Earth. (SP) Bremenn, Jukes

Upper Division Courses


122L. Biophysical Laboratory. (4) Two 1-hour lectures and two 3-hour laboratories per week. Prerequisites: 122 (may be taken concurrently). Formerly Biophysics 111. An interdisciplinary laboratory emphasizing the application of physics and chemical methods to problems in quantitative biology. Experiments are drawn from a wide range of biological phenomena. (F,SP) D. Kostland


*125. Topics in Biophysics and Cell Physiology. At least one course per semester will be offered from the following list:

125B. Computer Simulations in Biology and Physics. (3) One 1-hour lecture and two 3-hour laboratories per week. Prerequisites: 120 or 122 or consent of instructor. Formerly Phys 139. Computer workshop. Classes and sessions and reading assignments present special topics in physics and Biophysics which are particularly suitable for study by computer simulation. Students will learn to set up standard simulations of their own original problems. (SP) Macey

125C. Physics of the Sensory Systems. (3) Three hours of lecture/discussion per week. Prerequisites: 120 or 130 or consent of instructor. Characterization of sensitivity of hair cells in cristae, stereocilia, vestibular structures and other mechanosensitive systems. Concepts of signal/noise discrimination applied to higher sensory processing. (F) Lecar

125G. Physiology of the Aging Process. (3) No credit. Formerly Physiology 139. Computer work shop. Class sessions and reading alignments present special topics in physiology and Biophysics which are particularly suitable for study by computer simulation. Students will learn to set up standard simulations of their own original problems. (SP) Macey

125T. Physiology of Human Development. (3) Three hours of lecture per week. Prerequisites: Biology 1A-1B. Formerly Physiology 152. The developing human from conception to neonatal adaptation, the molecular target or targets of ionizing radiation, the mechanisms of repair and restitution of cell proliferation. (F) Alpen

125U. Physiology of Human Development. (3) Three hours of lecture per week. Prerequisites: Biology 1A-1B. Formerly Physiology 152. The developing human body from prenatal life to maturity; fertilization, embryology, and fetal physiology birth and neonatal adaptation; applications of radiation to biological investigation and to medical diagnosis and treatment. The effects of radiation on molecules, cells, whole organisms and populations. (F) Alpen

125V. Physiology of the Aging Process. (3) No credit after taking 125G. Three 1-hour lectures per week. Prerequisites: Biology 1A-1B. Formerly Physiology 152. The effects of aging on human physiology; functional changes at organismic, cellular sub-cellular and molecular levels. Comparative epidemiological and environmental aspects. Theories of aging and perspectives on aging modification and life extension. (SP) Timiras

125W. Physiology of the Aging Process. (3) No credit after taking 125G. Three 1-hour lectures per week. Prerequisites: Biology 1A-1B. Formerly Physiology 152. The effects of aging on human physiology; functional changes at organismic, cellular sub-cellular and molecular levels. Comparative epidemiological and environmental aspects. Theories of aging and perspectives on aging modification and life extension. (SP) Timiras

125X. Physiology of the Aging Process. (3) No credit after taking 125G. Three 1-hour lectures per week. Prerequisites: Biology 1A-1B. Formerly Physiology 152. The effects of aging on human physiology; functional changes at organismic, cellular sub-cellular and molecular levels. Comparative epidemiological and environmental aspects. Theories of aging and perspectives on aging modification and life extension. (SP) Timiras

125Y. Physiology of the Aging Process. (3) No credit after taking 125G. Three 1-hour lectures per week. Prerequisites: Biology 1A-1B. Formerly Physiology 152. The effects of aging on human physiology; functional changes at organismic, cellular sub-cellular and molecular levels. Comparative epidemiological and environmental aspects. Theories of aging and perspectives on aging modification and life extension. (SP) Timiras

125Z. Physiology of the Aging Process. (3) No credit after taking 125G. Three 1-hour lectures per week. Prerequisites: Biology 1A-1B. Formerly Physiology 152. The effects of aging on human physiology; functional changes at organismic, cellular sub-cellular and molecular levels. Comparative epidemiological and environmental aspects. Theories of aging and perspectives on aging modification and life extension. (SP) Timiras

Graduate Courses

*220. Advanced Topics in Biophysics and Cell Physiology. At least one course will be offered each semester from the following list:

220A. Structural Biology. (3) Two 1-hour lectures per week. Prerequisites: 102 and 122: Mathematics 50A-50B, or consent of instructor. Introduction to current research in structural biology. Emphasis on the use of advanced physical methods in the elucidation of protein, nucleic acid, and membrane structure. Glaeser, Blatik, Nelson

220B. Membrane and Lipid Protein Structure and Dynamics. (3) Two 1-hour/lecture/discussions per week. Prerequisites: 122, upper division course in physical chemistry or statistical mechanics. Formerly Biophysics 201 Characterization of cell membranes and lipoproteins by physical methods. Examples to be studied include myelin, erythrocyte, thalaspid and purple membranes. Analytical methods include electron microscope, transport phenomena and surface tension, fluorescence and photobleaching recovery, electrical noise measurements and single channel recording, statistical mechanics and molecular dynamics. (F) Glaeser

220C. Mathematical Models and Methods in Biology. (3) Three 1-hour/lecture discussions per week. Prerequisites: Biology 1A, Math 50A-50B or consent of instructor. Formerly Biophysics 221 The art of mathematical modeling. Selected examples from population dynamics, epidemiology, physiology and neurobiology. (SP) Brezowitz

220E. Free Radicals and Oxygen Toxicity in Biology. (2) Two hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Formerly Physiology 217 Chemistry of free radicals and activated species. Generation of radicals and singlet oxygen (in vivo and in vitro); detection methods and biological defenses mechanisms. Oxidative damage; benefits and liabilities of oxygen toxicity to cells. (SP)

229A. Ion Channels and Membrane Excitability. (2) One 2-hour seminar per week. Prerequisites: Consent of instructor. Seminar course in the biophysics of membrane transport phenomena and ion channel transduction process underlying excitation in the nervous system. We will discuss topics in the biophysics of ion channels such as single-channel fluctuations, theories of channel gating, ion selectivity, and transport via ion channels, as well as selected topics in the modeling of neural excitation such as nonlinear mechanisms of electrical excitation, neural and stochastic properties of neural firing. (F) Lecar

229B. Radiation Biophysics. (2) One 2-hour seminar per week. Effects at the molecular and cellular level of ionizing radiation exposure. The emphasis will be on biophysical models of cell killing and cell transformation, the molecular target or targets of ionizing radiation, and the mechanisms of repair recovery and restitution of cell proliferation. (F) Alpen

229C. Physical Optics and Crystallography. (2) One 2-hour seminar per week. Formerly Biophysical Optics 240. A combination of didactic presentations and informal discussions of methods and theories in physical optics and diffraction, as applied to crystallography of biological macromolecules. Emphasis on new developments, with the development of suitable background. (F) Glaeser

229D. Structural Biophysics. (2) One 2-hour seminar per week. Structural biology with emphasis on proteins and nucleic acids, cell membranes, cytoskeletal and motile systems. (F) Glaeser

229E. Auditory Transduction. (2) One 2-hour seminar per week. Prerequisites: None. Structure and function of hair cells including stereociliary mechanics, transduction processes, and electrophysiology. Open to graduate students and senior undergraduates. (F) Bearden
229F. Retinal Signal Processing. (2) One 2-hour seminar per week. Must be taken on a satisfac- tory/unsatisfactory basis. Prerequisite: Consent of instructor. Formerly Psychology 12. Students will participate in current research into the mechanisms of phototransduction, signal transfer and signal processing in the vertebrate retina. (F) Owen

229G. Membranes and Transport. (2) One 2-hour seminar per week. Must be taken on a satisfac- tory/unsatisfactory basis. Prerequisites: None. Erythrocyte membrane transport. (SP) Macey

"229J. Mechanisms of DNA Repair. (2) One 2-hour seminar per week. The various molecular processes by which damaged DNA is repaired in procaryotic and eucaryotic organisms will be reviewed. Mortimer

229K. Atherosclerosis. (2) One 2-hour seminar per week. Several areas to be covered include molecular, cellular, and clinical aspects of atherogenesis. The format will consist of participation in research workshops, seminars, and journal club. A term paper focusing on a specific topic area will be required. (F) Nichols

"229M. Cell Membrane Bioenergetics. (2) One 2-hour seminar per week. This course will concentrate on redox electron transport of membrane electron transport systems, biological oxidations which cause an active oxygen cascade and new developments and techniques to study the assembly and organization of outer and inner membrane systems. (SP) Macey

229N. Development and Aging. (2) One 2-hour dis- cussion per week. Formerly physiology 282. Develop- ment and aging, with particular emphasis on the neuroendocrine systems as well as presentation and evaluation of research in these areas conducted by seminar participants. (F) Tirriaras

229P. Mathematical Biophysics. (2) One 2-hour seminar per week. This seminar will explore advances in nerve net theory, optimization, mathematical com- plexity theory, genetic algorithms, theory of the evo- lutionary significance of sex, host-pathogen population dynamics and modeling of the immune response. All these subjects are related (often closely) at the level of mathematical description. The seminar is intended to follow important developments in any of these and related areas. (F) Bremermann

Division of Cell and Developmental Biology
Head: Terry E. Machen

Lower Division Courses

Biology 1A. General Biology. (4) Three 1-hour lec- tures, one 3-hour laboratory, and one 1-hour discussion per week. Formerly Zoology 1A, Chemistry IA-IB, Chemistry IA with a grade of B or better and current enrollment in Chemistry IA; Chemistry IA recommended concurrently. General introduction to cell structure and function, molecular and organismal genetics, embryonic 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. Sponsored by Molecular and Cell Biology. (F,SP)

Note: Biology 1A and 1B are taught both fall and spring semesters. Neither is a prerequisite for the other.

31. The Biology of Human Potential. (3) Three 1- hour lectures and one hour discussion per week. For- mely Zoology 13. Biological basis for outstanding hu- man performance; evolutionary, physiological, and genetic determinants of selected human functions. (SP)

32. Introduction to the Biology of Human Cells. (3) Three 1-hour lectures per week. Prerequisites: One year high school or college chemistry. Formerly Physi- ology 1. A comprehensive introduction to human cell biology. The course will concentrate on basic mechan- isms underlying human life processes, including cell structure and function; nervous and muscle function; cardio- vascular, respiratory, renal, and gastrointestinal physiology; metabolism, endocrinology, and repro- duction. (F)

32L. Introduction to Biology of Human Cells, Lab. (1) One 3-hour laboratory and one 1-hour discussion per week. Prerequisites: Concurrent with Molecular Cell Biology 32; high school or college chemistry. Formerly Physiology 1 L. Experiments and demonstrations are designed to amplify and reinforce information presented in lecture investigations into the structure and function of muscle, nerve, cardio- vascular, renal, respiratory, endocrine and blood systems. (F)

Upper Division Courses

130L. Cell Biology. (4) Three hours of lecture and one hour discussion per week. Prerequisites: Biology 1A; recommended: 102; Formerly Zoology 104 and 105, Physiology 100. An introductory survey of cell and de- velopmental biology. The assembly of supramolecu- lar structures; membrane structure and function; the cell surface; cytoplasmic membranes; the cytoskeleton and cell motility; the eukaryotic genome, chromo- matin, and gene expression; the cell cycle; organelle biogenesis, differentiation and morphogenesis. (FSP) Schliwa, Steinhardt, Cande, Dubin

130L. Cell and Developmental Biology Laboratory. (4) Two 1-hour lectures and two 3-hour laboratories per week. Prerequisites: May be taken concurrently with 130. Formerly Physiology 100L, 101L, Zoology 115, A, B, C. Analysis of the bio- chemical problems of cell and development biology, in- cluding methods of biochemical analysis of cells, analysis of hormone and receptor interactions, optical microscopy, microinjection, and microsurgery embryos, developmental anatomy. (F.SP) Staff

131L. Developmental Biology. (3) Three hours of lec- ture and one hour discussion per week. Prerequisites: 102, Biology 1A-1B; 130 recommended. Formerly Zo- ology 105. An introduction to principles and processes of embryonic and post-embryonic development, stressing mechanisms of cell and tissue interactions, morphogenesis and regulation of gene expression. (SP) Garhart, Keller

132L. Histophysiology. (4) Two 1-hour lectures, one 1-hour discussion, and one 3-hour laboratory per week. Prerequisites: Biology 1A-1B. Formerly Anatomy 105. The structural basis for the function of mammalian (particularly human) tissue and organ systems. Both light and electron microscopic levels of organization are considered. (SP)

133L. Cellular Variation, Adaptation, and Transfor- mation of Animal Cells. (2) Two hours of lecture per week. Prerequisites: Biology 1A-1B. Formerly Biology 110. Examination of the evidence for Dauermodifica- tion in Caenorhabditis elegans, the behavior of a cell. A comparison of the single-cell and multicellular organisms. DM are non-mutational changes in cell behavior and func- tion which may persist through many divisions after withdrawal of the conditions that evoked them. We shall consider the role of such adaptive changes in dif- ferentiation, cancer, and evolution. (SP) H. Rubin

134L. Developmental Anatomy. (4) Three 1-hour lec- tures and one 3-hour laboratory per week. Prerequi- sites: Biology 1A-1B. Strongly recommended: an in- troduction to Human Anatomy. Formerly Anatomy 151. Conception, nidation and the develop- ment of the human embryo or fetus. Determinants of abnormal development and introduction to experi- mental teratology. (SP)

135L. Topics in Cell and Developmental Biology. Three 1-hour lectures per week. At least 5 courses per year will be offered from following list. (F.SP)

- 135A. Molecular Endocrinology. (3) Three 1-hour lec- tures per week. Prerequisites: 102, Biology 1A-1B, Chemistry 8A-B, or consent of instructor. Formerly Physiology 142. Molecular mechanisms by which hor- mones regulate homeostatic systems, genetic transcription and hormone expression; hormone-receptor interaction; synthesis, transport and targeting of hormones, growth factors and receptors.

- 135B. Cell Motility. (3) Three 1-hour lecture demon- strations per week. Prerequisites: Course in Cell Bi- ology or Biochemistry or consent of Instructor. For- mely Biology 139. Mechanisms in cell movement and contractility in plant and animal cells. Mechanisms of muscle contraction, flagellar motility, and cell shape and motility. (SP)

135C. Regulation in Cells and Cell Systems. (3) Three hours of lecture and one hour discussion per week. Prerequisites: 130. Formerly Zoology 131. Studies on the regulation of cell metabolism, with special em- phasis on the relationships of the cell surfaces to con- trol of intracellular activities. A comparative approach to understanding the mechanisms of fer-tilization, lymphocyte activation, cell cycles, hormonal stimulations, cell secretion, cell-cell interactions, and cell-cell communication. (SP) Steinhardt

135F. Tumor Biology. (3) Three hours of lecture per week. Prerequisites: Senior standing; 102; 110 or 130 or 131 or 140; or consent of instructor. Formerly Zo- ology 112. Lectures, assignments, readings and individual reports on biological aspects of experimental cancer research. Topics covered may include: tumor viruses; viral transforming genes; proto-oncogenes, onco- genes, anti-oncogenes; teratocarcinomas; cellular differentiation; hormone carcino genesis; hormonal carcinogenesis; tumor immunology; plant tumors. (SP)

135G. Biology of Human Cancer. (3) Three 1-hour per week courses. Prerequisites: Biology 1A and 1B. Formerly Zoology 119. Lectures and assigned reading on biological aspects of tumor research, dealing with exper- imental and human tumors. Topics covered may include: viral, chemical and hormonal carcinogenesis, tumor immunology, oncogenes and anti-oncogenes, and a survey of current concepts and research deal- ing with human cancers. (SP) Nandi

135H. Physiology of the Endocrine. (3) Three 1-hour lecture per week. Prerequisites: Biology 1A-1B, Chemistry 8A-8B. Biochemistry 102 of concurrent enroll- ment. Formerly Physiology 147. The endocrine glands of mammals and their hormones. Strong emphasis is placed on clinical applications of normal and pathologic endocrine function in the human being, in- cluding the relationship of the central nervous system and pituitary gland to intermediary metabolism; growth; thyroid, adrenal and reproductive function; and sexual development. (F)

135J. Physiology and Pathology of Oxygen. (3) Two 1-hour lectures per week. Prerequisites: A lower division course in biology or physiology. Formerly 125H. Bio- logical oxidations: transport and consumption of oxy- gen. The role of oxygen in energy generation and in regulation of physiological and pathological pro- cesses. Antioxidants, vitamins and food substances that counteract oxygen toxicity. (F) Packer

136L. Physiology. (4) Three 1-hour lectures and one hour of discussion per week. Prerequisites: Biology 1A-1B, Physics 8A-8B. Formerly 120L. Physical and chemical basis of organ function. A discussion of the importance of basic cellular processes in the function of cardiovascular, renal, respiratory, gastrointestinal, and nervous systems. (SP)

136L. Physiological Laboratory. (4) Two 1-hour lectures and two 3-hour laboratories per week. Prerequi- sites: Recommended: 136 be taken concurrently. Formerly Zoology 131L. Basic laboratory in cell and organ physiology. Laboratory will involve modeling and com- puter simulation of various physiological processes. (F)

137. Perspectives in Biology and Medicine. (3) Two hours of lecture and one hour of discussion per week. Must be taken on a pass/fail basis. Prerequisites: Consent of instructor for se- niors planning to enter medicine or other areas of health care. Lectures, reading and discussion of the impact of medicine on health, health policy, genetic, technological and environmental aspects of specific diseases, contem- porary research into specific diseases. Students will analyze recent research literature and evaluate progress in understanding mechanisms of disease etiology and prevention. (F)

*On leave, spring
*Recalled to active service
*Recipient of Distinguished Teaching Award
Graduate Courses

230A. Advanced Cell and Developmental Biology. (3) Two 1½-hour lectures per week. Prerequisites: 130. Advanced treatment of topics in cell biology. (F) Staff

230B. Advanced Cell and Developmental Biology. (3) Two 1½-hour lectures per week. Prerequisites: 130; 131; 142; 230A; or consent of Instructor. Formerly Zoology 201. An advanced treatment of topics in morphogenesis: determination and differentiation in developing systems. (SP) Staff

233. Mathematical Modeling of Biological Systems. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Calculus and differential equations, Biology 1A-1B, or consent of instructor. Formerly Bioophysics 224. The art of rendering the essential features of biological systems in mathematical language. Topics include: morphology of the cell and tissue level, circadian rhythms, biomechanics, and evolution. Emphasis is on biologically realistic models. (F)

234. Development Review. (1) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly IDS 205. A seminar devoted to the analysis of major problems in animal and plant embryology-cell type determination, pattern formation, and the interactions and mechanisms of morphogenesis with emphasis on regulations and integration of developmental events at the cellular, molecular, and tissue levels of organization. (F,SP)

234A. Development Review. (1) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly IDS 205. A seminar devoted to the analysis of major problems in animal and plant embryology-cell type determination, pattern formation, and the interactions and mechanisms of morphogenesis with emphasis on regulations and integration of developmental events at the cellular, molecular, and tissue levels of organization. (F,SP)

235. Advanced Topics in Cell Motility. (1) Course may be repeated for credit. One 1-hour lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Bioophysics 229. Reviews and reports of current literature in cell motility and cytoskeleton organization, function, and assembly. (F,SP)

236. Wednesday Evening Development Seminar. (1) One ½-hour discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of Instructor. Formerly 220. This class consists of relatively informal weekly research presentations in the areas of developmental biology, development, neurobiology, or relevant 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)

237. Research Review in Cell and Developmental Biology. May be repeated for credit. One 2-hour 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)

239A. Animal Cells and Viruses. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Molbiol 217. Review of current literature and discussion of original research. H. Rubin

239B. Differentiation and Transformation of Cultured Animal Cells. (2) May be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Review of current literature and discussion of original research. H. Rubin

239C. Vertebrate Development. (2) May be repeated for credit. One 2-hour 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) Gerhardt

239D. Epithelial Function, Structure, and Regulations. (2) May be repeated for credit. One 2-hour 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) Macher

239E. Tumor Biology. (2) May be repeated for credit. One 2-hour 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) Nandi

239F. Neuron Process Outgrowth. (2) May be repeated for credit. One 2-hour 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) Bentley

239G. Photoreceptor Motility and Morphogenesis. (2) May be repeated for credit. One 2-hour 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) BurnsId

239H. Cell Division. (2) May be repeated for credit. One 2-hour 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) Canoe

239J. Steroid Hormone and Growth Factor Action. (2) May be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Molecular mechanisms of steroid hormone regulation of glycoprotein trafficking and cellular proliferation, as well as the growth factor regulation of normal and tumor cell growth. (F,SP) Firestone

239K. Morphogenesis. (2) May be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Cellular and molecular aspects of morphogenetic movements. (F,SP) Keller

239L. Protein Secretion in Animal Cells. (2) May be repeated for credit. One 2-hour 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) Schliwa

239M. Cell Regulation in Growth and Differentiation. (2) May be repeated for credit. One 2-hour 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) Moore

239N. Biophysics of Cell Motility and Morphogenesis. (2) May be repeated for credit. One 2-hour 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) Oster

239P. Cell Motility and the Cytoskeleton. (2) May be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Dynamics and cytoskeletal organization. (F,SP) Schliwa

239Q. Cell Regulation in Growth and Differentiation. (2) May be repeated for credit. One 2-hour 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) Steinhardt

239R. Cellular Transport Processes. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Review of current literature and discussion of original research on the operation and regulation of physiological transport processes. (SP) Forte

239T. Muscle Regulation. (2) May be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Muscle growth during regeneration and hypertrophy. Extracellular matrix-growth factor interactions. (F,SP) Wilf

239U. Leech Embryology and Development. (2) May be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Review of current literature and discussion of original research. (SP) Weisblat

239V. Developmental Biology. (2) May be repeated for credit. One 2-hour 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) Drubin

Division of Genetics

Head: Gerald M. Rubin

Lower Division Courses

141. Heredity and Society. (3) Two hours of lecture and 1 hour of section per week. Prerequisites: Primary for students not specializing in biology. Formerly Genetics 101. Basic mechanisms of inheritance; gene mapping; genetic disease in animals and humans; social implications of genetics.

Upper Division Courses

140. General Genetics. (4) Three hours lecture and one hour of section per week. Prerequisites: 110. Formerly Genetics 102. A survey of genetics, including mechanisms of inheritance; gene transmission and recombination; transposable DNA elements; gene structure, function, and regulation; and developmental genetics. (F,SP) Staff

140L. Genetics Laboratory. (4) Two 1-hour lectures and two 3-hour laboratories per week. Prerequisites: 140. May be taken concurrently. Formerly Genetics 100L. Experimental techniques in classical and molecular genetics. (SP) G. Rubin

142. Survey of General Genetics. (3) Not open to students with credit in 140. Three hours of lecture and 1 hour of discussion per week. Prerequisites: Biology 1A-1B or consent of instructor. Recommended: Chemistry 8A-8B. Formerly Genetics 102. A survey of genetics with primary emphasis upon mechanisms of heredity and molecular genetics. Includes some treatment of evolutionary genetics. (SP) Fristrom

Graduate Courses

240. Advanced Genetic Analysis. (3) Two 1½-hour lectures per week. Prerequisites: Graduate standing with 110 and 140 or 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) Rine, Anderson

242A-242B. Advanced Topics in Genetics. (2) The course may be repeated for credit. Two 1½-hour lectures and one 1-hour section per week. Prerequisites: Graduate standing with 110 and 140 or equivalent or consent of instructor. Advanced level of coverage of current research problems in genetics. Topics covered vary from year to year. (SP) Staff

243. Neurogenetics. (2) Two 1½-hour lectures and one 1-hour section per week. Prerequisites: Graduate standing with 110; 140; or consent of instructor. Principles and practice of classical and modern genetic approaches to understanding the development and function of the nervous system. Goodman, G. Rubin
244. Developmental Genetics. (2) Two 1½-hour lectures and one hour section per week. Prerequisites: Graduate standing or consent of instructor. Genetic and molecular genetic approaches to understanding the development of multicellular organisms. (F) Staff

245. Chromosome Structure. (2) Two 1½-hour lectures per week and one hour of section per week. Prerequisites: 110; 140; and consent of instructor. The molecular and genetic nature of chromosomes and their function in replication, gene expression, cell division and cell differentiation.

246. Mammalian Genetics. (2) Two 1½-hour lectures and one hour section per week. Prerequisites: 110; 140; graduate standing or consent of instructor. Introduction to the principles and experimental methods of mammalian genetics. Major topics to be covered are genome organization and expression, genome evolution, and methods of genetic analysis in mammals.

249. Research Review in Genetics. Course may be repeated for credit. One 2-hour 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) Blair

249A. Developmental Genetics of Insect Metamorphosis. (2) Course may be repeated for credit. One 2-hour lecture and one hour of section per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Gene expression and function during metamorphosis. (F, SP) Fristrom

249B. Developmental and Molecular Genetics of Drosophila. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 257. 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) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biochemistry 244. Gene regulation and developmental molecular biology. (F, SP) Rubin

249F. Bacterial Genetics. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Microbiology 251. Role of nucleic acids in gene regulation and expression in bacteria. Prerequisites: Consent of instructor. Formerly Biochemistry 236. Experimental approaches to Drosophila embryogenesis, ranging from classical embryology and classical genetics to molecular genetics and biochemistry. (F, SP) Anderson

249G. Developmental Genetics in Drosophila. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Microbiology 234. Presentation and discussion of current research on gene regulation in Drosophila and other eukaryotes. Beckendorf

249H. Gene Expression in Drosophila. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Molecular Biology 234. Presentation and discussion of current research on gene regulation in Drosophila and other eukaryotes. Beckendorf

249I. Molecular Genetics of Insect Neuronal Development. (2) One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Molecular and cellular analyses of neuronal development and function. (F, SP) Shin

249J. Molecular Genetics of Insect Neuronal Development. (2) One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Molecular and cellular analyses of neuronal development and function. (F, SP) Shin

249K. Cancer and Immunology. (1) One 2-hour seminar per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Formerly Microbiology 202A. Lectures and discussions on cancer, immunology and molecular biology. (F, SP) Sakano

250. Advanced Immunology. (3) Two 1½-hour lectures and one hour of discussion per week. Prerequisites: 100, 110, 140, 150 or consent of instructor. Formerly Microbiology 202A. The immune response; antigen-antibody reactions; structure and function of antibody molecules; both structural and regulatory; lymphocyte differentiation; cellular interactions; and mechanisms of immunity and tolerance. (F) Koshland, Raulet

250L. Advanced Immunology Laboratory. (3-8) Course may be repeated for credit. Two hours of lecture and 12 to 18 hours of lab per week. Prerequisites: 100, 110, 140, 150 or the equivalent or consent of instructor. Formerly Microbiology and Immunology 202L. Students with special lab interests may take portions of the course on an individual basis. In the first module, students will learn a variety of molecular and cellular immunological techniques including production of monoclonal antibodies. In the second module, students will work on individual projects that require the application of immunological techniques. (F) Good

252. Immunobiology of the T-Lymphocyte. (3) Two 1-hour lectures/discussion per week. Prerequisites: Consent of instructor. Thymus-derived lymphocytes play a central role in the immune system, recognizing foreign antigens in the context of self-antigens, and carry out both effector and regulatory functions. This course will cover cellular, humoral and molecular aspects of the T-cell systems with emphasis on the differentiation of T-cells, acquisition of antigen repertoire, and molecular biology of antigen recognition. Course designed for graduate students in immunology, molecular biology, and genetics. (SP) Allison

254. Molecular Biology of Cancer. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Microbiology 233. Introduction to lectures followed by student presentations and discussion of current research. Topics to be covered include mechanisms of transformation, the properties of viral oncogenes and transforming proteins, the role of host factors and chemicals in carcinogenesis, and cellular oncogenes.

255. Research Review in Immunology. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Microbiology and immunology 202L. Review of current literature and discussion of original research. (F, SP)

259A. Differentiation of T Lymphocytes. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Molecular basis of antigen recognition function of T lymphocytes. (F, SP) Shastri

259B. Specificity of T Lymphocytes. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Microbiology 202A. The immune response; antigen-antibody reactions; structure and function of antibody molecules; both structural and regulatory; lymphocyte differentiation; cellular interactions; and mechanisms of immunity and tolerance. (F) Koshland, Raulet

259C. Regulation of Genes Involved in the Immune Response. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Molecular biology of immunoglobulin genes, T cell antigen receptor genes, MHC genes, and genes of lymphokines and their receptors. (F, SP) Sakano

259D. Lymphokine Signaling of B Cell Immunoreponses. (2) One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Molecular analyses of lymphokine receptors, signaling pathways, and mechanisms of gene regulation. (F, SP) Sakano

259E. Regulation of T Cell Receptor Genes Expression. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Molecular biology of T cell receptor genes and their transcriptional regulation. (F, SP) Sakano

259F. Programmed cell death during thymocyte differentiation. Winoto

259G. Antigen Receptor Repertoire of T Lymphocytes. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Molecular biology of T cell receptor genes and their transcriptional regulation. (F, SP) Sakano

Division of Neurobiology

Head: Gerald Westphal

Lower Division Courses

61. Human Brain and Behavior. (3) Two 1-hour lectures and one 1-hour discussion per week. Must be taken on a passed/not passed basis. Formerly Physiology 10. Introduction to brain mechanisms in humans of sensation, movement, perception, thinking, learning, and emotion.
memory, and emotion; in terms of anatomy, physiology and chemistry of the nervous system in health and disease. Intensive lecture courses in the humanities and social sciences and others not majoring in the biological sciences. (SP) Freeman

Upper Division Courses

160. Neurobiology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 102 or 100, Biology 1A, Physics 8A-8B. Formerly Zoology 121. An introductory course designed to provide a general understanding of current knowledge of the nervous system, including regulation of nerve cell types; guidance of growing nerve fibers; competition and cell death in the maturation of synaptic connections, plasticity, and genetic and molecular mechanisms. (SP) Zucker

162. Developmental Neurobiology. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 130, 160 or equivalent. Formerly IDS 113, Anatomy 154. Analysis of the strategies and processes of nervous system development, including generation of diverse nerve cell types; guidance of growing nerve fibers; competition and cell death in the maturation of synaptic connections, plasticity, and genetic and molecular mechanisms. (SP) Stent, Weissblat

163. Mammalian Neuroanatomy. (3) Two 1-hour lectures and two 1-1/2-hour laboratories per week. Prerequisites: Biology 1, Formerly IDS 112, Anatomy 110. Development of the structure (gross and microscopic) and functional relationships of the mammalian nervous system. (F) Winer

164. Sensory and Integrative Neurobiology. (3) Two 1-1/2 hours per week. Prerequisites: 160. Transmission, 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 different levels of sensory processing. Correlation of findings and principles from neurophysiology and psychophysics. (SP) Werblin

165. Molecular Neurobiology and Neurochemistry. (3) Two 1-1/2 hours per week. Prerequisites: 102 or 110, 160. The molecular and biochemical aspects of the structure and function of the nervous system. (SP)

Graduate Courses

260. Advanced Cellular Neurobiology. (3) Two 1-1/2 hour lectures per week. Prerequisites: 160. Formerly IDS 200A. Physical-chemical basis of membrane potentials, electrophorectic, action potential generation, and propagation, synaptic transmission, sensory receptor function, and volume conductor potentials. (F)

260L. Advanced Neurobiology Laboratory. (5) Two 6-hour laboratories plus one 3-hour demonstration per week. Prerequisites: 260 (may be taken concurrently). Formerly Neurobiology 200L. Advanced laboratory course for graduate and advanced undergraduate student with a working knowledge of current anatomical, physiological, and biophysical techniques in neurobiology through demonstrations, exercises, and individual research problems. Topics include synaptic transmission, excitable membranes, sensory reception and circuits of neurons generating behavior. (F)

252. Integrative Neurobiology. (3) Two 1-1/4 hours and one 1-hour discussion per week. Prerequisites: 250. In-depth coverage of current research questions central to the understanding of the organization of nervous systems, and of the behavior mediated by these systems. When appropriate, the lectures are illustrated with examples drawn from both the vertebrate and invertebrate literature. Circuit, networks, or system analysis and analysis will be emphasized where these approaches lend clarity. Sensorimotor integration is discussed in small systems or neurons. (SP)

263. Advanced Developmental Neurobiology. (3) Two 1-1/2 hours per week. Prerequisites: 162 or equivalent. Advanced level coverage of current research problems in the embryonic and post-embryonic development of invertebrate and vertebrate nervous systems. Goodman

254. Neural Networks and Biological Computation. (3) Two 1-1/2 hours per week. Prerequisites: Consent of instructor. Math 20B. Survey of work on neural nets including that of Pitts and McCulloch (binary nets), Rosenblatt (perceptrons), Minsky and Papert (perceptrons), the Parallel Distributed Processing group, Kohonen, Grossberg, Hopfield and others. The central nervous and the human visual system will also be described. Many examples of applications of neural nets to vision and to other problems of biology and physics will be given. (F) Glaser

265. Advanced Topics in Neurobiology. (1) Course may be repeated for credit. Times to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 160 or consent of instructor. Formerly IDS 202 Review of current literature. (F,SP) Staff

269. Research Review in Neurobiology. (2) Course may be repeated for credit. One 2-hour 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)

269A. Development of the Leech Nervous System. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. (SP) Stent

269B. Synaptic Transmission. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Role of calcium in regulating neural activity and synaptic function. Zucker

269C. Neurodynamics. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. (F) Freeman

269D. Invertebrate Systems Neurobiology. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Miller

269E. Auditory Neuroscience. (2) One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. (F) Freeman

269F. Retinal Signal Processing. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. (F,SP) Staff

H190. Honors Research Seminar. (1) Course may be repeated for credit. One 1-hour meeting per week. Prerequisites: Concurrent enrollment in H196 and consent of instructor. Formerly Genetic H194, Microbiology and Immunology H190, Molecular Biology H190. Seminar on presentation and evaluation of the scientific literature and the student's research results in the area of the research project covered under H195. (F,SP) Staff

H196. Honors Research. (1-4) Course may be repeated for credit. Laboratory research. May be taken on a passed/not passed basis. Prerequisites: Enrollment in departmental honors program and consent of instructor. Formerly Biochemistry H196, Biology H195, Biophysics 195A-195B, Genetics H192, Microbiology and Immunology H191, Molecular Biology H196, Physiology 195H, Zoology 195-196. Individual research followed by a written report, under the supervision of a staff member. (F,SP) Staff

H199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Laboratory research. May be taken on a passed/not passed basis. Prerequisites: Overall GPA of at least 3.0 and consent of instructor. Formerly Biochemistry 199, Biology 198, Biophysics 198, Genetics 199, Microbiology and Immunology 199, Molecular Biology 199, Physiology 199, Zoology 199. Enrollment is restricted by regulations listed on pages 91-92 of this catalog. (F,SP) Staff

Graduate Courses

280. Graduate Seminar. (1) Course may be repeated for credit. One 1-hour seminar per week. Prerequisites: Graduate standing in the department or consent of instructor. Formerly Biochemistry 290, Biophysics 290, Genetics 290, Molecular Biology 290, Physiology 292, 293, Zoology 214, 216, 236, Graduate student presentations on selected topics in molecular and cellular biology. Several sections offered each semester, covering different topics. Concurrent enrollment in more than one section is permitted. List of topics to be announced in advance of each semester. (F,SP) Staff

291A. Introduction to Research. (4-12) Laboratory research and conferences. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Consent of instructor. Formerly Biochemistry 270, Microbiology and Immunology 270, Molecular Biology 211, Zoology 209. Close supervised experimental work under the direction of an individual staff 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 and conferences. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Consent of instructor. Formerly Biochemistry 270, Microbiology and Immunology 270, Molecular Biology 211, Zoology 209. Close supervised experimental work under the direction of an individual staff member; an introduction to experimental methods and research approaches in particular areas of molecular and cell biology. (F) Staff

292. Research. (3-12) Course may be repeated for credit. Laboratory research, conferences. Formerly Biochemistry 296, Biophysics 299, Genetics 299, Micro-
biology and Immunology 280, Molecular Biology 280, Physiology 299, Zoology 299. Individual research under the supervision of a staff member. (F, S) Staff

293A. Research Seminar. (1) One 1-hour seminar per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Concurrent enrollment in 291A or 292. Formerly 293. Seminar on presentation and evaluation of results in area of student's individual research interests. (F) Thorton

293B. Research Seminar. (1) One 1-hour seminar per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Concurrent enrollment in 291B or 292. Formerly 293. Seminar on presentation and evaluation of results in area of student's individual research interests. (SP) Thorton

601. Individual Study for Master's Students. (1-8) Units may not be used to meet either unit or residence requirements for a master's degree. Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Formerly Biophysics 601, Genetics 601, Microbiology and Immunology 601, and Zoology 601. 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) May not be used for unit or residence requirements for the doctoral degree. Course may be repeated for credit. Reading and conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Restricted to Ph.D. candidates. Formerly Biochemistry 602, Biophysics 602, Genetics 602, Microbiology and Immunology 602, Molecular Biology 602, Physiology 602, Zoology 602. 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

389. Teaching of Molecular and Cell Biology. (2) Course may be repeated for credit for two semesters (up to 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. Formerly Biophysics 300, Biochemistry 300, Physiology 300, Zoology 301, 302. Teaching laboratories and/or discussions for Molecular and Cell Biology. Prerequisites: analysis of specific format and problems. (F,SP) Staff

481. Instrumentation in Molecular and Cell Biology. Tutorial must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing; consent of instructor and sponsorship of a faculty member. Formerly IDS 292. Good

481B. Transmission Electron Microscopy. (1-4) Tutorial must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing; consent of instructor and sponsorship of a faculty member. Formerly IDS 292. Good

481C. Scanning Electron Microscopy. (1-4) Tutorial must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing; consent of instructor and sponsorship of a faculty member. Formerly IDS 292. Good

481D. Physiological Instrumentation. (1-4) Tutorial must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing; consent of instructor and sponsorship of a faculty member. Formerly IDS 292. Good

481E. Principles and Operation of the Light Microscope. (1-4) Tutorial. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing; consent of instructor and sponsorship of a faculty member. Formerly BEHS 185. Thornton

481F. Basic Scientific Photography. (1-4) Tutorial. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing; consent of instructor and sponsorship of a faculty member. Formerly Biology 498. Black and white photographic skills: developing, printing, and exposure. Students must have access to a 35mm camera.

Interdepartmental Studies Courses

Upper Division Courses

*IDS 114A-114B. Advances in Aging: Alzheimer's Disease; Biological and Social Dimensions. (2,2) One 2-hour lecture per week in the evening. Prerequisites: High school biology and chemistry. This interdisciplinary course will single out specific topics in aging of great current interest (fall, Alzheimer's disease; spring, strategies for intervention) and present lectures on all aspects of each topic (biomedical, health, socio-economic, legal, and ethical). Invited speakers with special expertise in these areas will participate. Sponsoring departments: Optometry, Social Welfare, Public Health, and Molecular and Cell Biology.

*IDS 119. Multidisciplinary Studies and Field Experience in Aging. (2) Sponsoring departments: Optometry, Social Welfare, Public Health, and Molecular and Cell Biology. One 2-hour seminar per week for 10 weeks and 6 hours of field work. Prerequisites: Upper division or graduate student and consent of instructor. Study of adults 70 years and over. Students will visit older patients from local geriatric clinic and confer with clinic staff. One hour weekly seminar consists of lecture by faculty on aging from specific discipline. Other hour is devoted to case presentation by student on a patient's condition. Course grade based on written paper and final paper demonstrating understanding of interdisciplinary nature of aging and caring for older people.

Graduate Courses

*IDS 282. Tumor Biology Seminar. (1) Course may be repeated for credit. One hour 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.

IDS 295. Systems and Integrative Biology. (1) Course may be repeated for credit. One 2-hour seminar lecture every other week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Biophysics, Bioengineering, Nutritional Sciences or Physiology. Presentation and discussion of current research in integrative, developmental, and regulatory biology. Emphasis on interdisciplinary communication and approaches. Sponsoring departments: Nutritional Sciences and Molecular and Cell Biology. (SP)

Music

(College of Letters and Science)

Department Office: 104 Morrison Hall, 642-2678 Chair: Joseph Kerman, Ph.D.

Professors:
Philip Beet, Ph.D. Philadelphia University. Church, English Renaissance, Baroque
Richard L. Crocker, Ph.D. Yale University. Medieval music, historical style.
Alan Curtis, Ph.D. University of Illinois. Early music performance, opera
Edward Dugger, M.F.A. Princeton University. Composition, electronic music
Richard Padian, Ph.D. University of Iowa. Composition, contemporary music, acoustics
Danial Heatir, Ph.D. Harvard University. (Larry and Evelyn Hammings Chairs) Medieval, Renaissance
John E. Harrigan, Ph.D. Stanford University. Computer music, music perception
Oly Wilson, Ph.D. University of Iowa. Composition, 20th-century, Afro-American music
Anna W. Imbrie, M.A. (Emeritus)
Lawrence H. Moe, Ph.D. (Emeritus)
Joanix Kn-Culmell (Emeritus)
Edgar H. Sparks, Ph.D. (Emeritus)

Associate Professor:
John Roberts (Acting), Ph.D. University of California at Berkeley. 19th-century opera

Assistant Professors:
Benjamin Brinner, Ph.D. University of California at Berkeley. Ethnomusicology, Indonesian music
John Butt, Ph.D. Cambridge University. Organ, J.S. Bach
Marka Kuzma (Acting), Indiana University. Choral conducting

Jorge Litterman, Ph.D. University of California. Composition, analysis, theory

Senior Lecturers:
Elizabeth Davidson, M.A. University of California. Musician, chamber music
John M. Swasey, M.B. University of California. Musicology, theory

Music

(College of Letters and Science)

Department Office: 104 Morrison Hall, 642-2678 Chair: Joseph Kerman, Ph.D.

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Elizabeth Davidson, M.A. University of California. Musician, chamber music
John M. Swasey, M.B. University of California. Musicology, theory

University Cariltonet:
Ronald M. Barnes, M.A.

Lecturers:
Virginia Baker (Viola) Sav M. (Guitar)
Scott Cribel, B.M. (Guitar)
Anthony Crowden, B.M. (Chamber music)
Chrisy Daniel, M.M. (Musician)
Lawrence Ferrara, M.M. (Guitar)
Richard Fuery, A.B. (Organ)
Rodney Gehrie, M.A. (Organ)
Dion Giannopoulos (Piano)
Laurene Goldberg, B.Mus. (Harpsichord)
Stuart Groninger, M.A. (French horn)
Janet Guggenheim, M.S. (Piano, chamber music)
Paul Hale, B.S. (Violoncello)
Peter Halff, M.Mus. (Violin, guitar)
Bonnie Hampton (Violoncello)
Eric Harten, M.A. (Violin)
C.K. Ledekzko (Afro drum)
Janet Mantore, B.Mus. (Flute)
Robin May, LL.B. (Cello)
Laurie McGaw, M.A. (Trumpet)

*On leave, spring
Recalled to active service
Recipent of Distinguished Teaching Award

Molecular Biology

(College of Letters and Science)

The biological sciences at Berkeley were reorganized in July 1989. Consult staff in the Department of Molecular and Cell Biology for information on undergraduate and graduate programs in molecular biology. Undergraduate students who declared the molecular biology major before fall 1989 may continue in the program provided they complete all degree requirements and graduate before fall semester 1993. Such students should contact Mary Sylvia; Department of Molecular and Cell Biology, 121 Genetics and Plant Biology Building, 643-7473.

Molecular Biology

(College of Letters and Science)

Office: 111 Genetics and Plant Biology Building, 642-9999

As a result of the reorganization of the biological sciences at Berkeley, the graduate program in Physiological Plant Biology has been incorporated into the graduate program of the Department of Plant Biology. Please see the Plant Biology section of this catalog for information.
First Year. Musicianship A-B; Harmony 1A-1B.
Second Year. Musicianship C-D; Harmony 2A-2B;
History of Western Music I, 70A-70B.
Recommended. Performance courses as listed in
upper division requirement (a).
Upper Division
Students complete a minimum of 24 semester
units of upper division music major courses from
the series 130-179, which must include the follow-
ing requirements: (a) Performance. A two-
semester sequence of either Music 141, University
Symphony, or Music 144, University Chorus; and
two additional courses from the performance series
140-149. (b) History of Western Music II, 170A-
170B. (c) Additional courses to complete the mini-
mum of 24 units in the series for majors 130-179.
Interdepartmental courses offered through the De-
partment of Music are acceptable for the major.
Honor Program, Adviser: Ms. Wade. Qualified
students majoring in music are invited to consult
the adviser concerning studies which they may pro-
pose to undertake. Research projects in music his-
tory, composition, analysis, performance, or other
areas of specialization will be considered. A mini-
mum of 4 units of Honors Course (H195) is re-
quired of seniors who wish to obtain departmental
honors at graduation.
Teaching Training. Consult major advisers.
The Minor
Lower Division
One year of harmony and musician ship (four courses); either the major series A-B and 1A-1B or
the non-major series 20A-20B and 25A-25B; Mu-
sic 27 or equivalent.
Upper Division
A minimum of five courses. At least two must be
taken from courses numbered in the 140s and at
least two must be taken from courses numbered in
the 120s and 130s (including IDS 135). With in-
troductory courses for either majors or non-
majors, depending on student qualifications.
For graduate students, the department offers pro-
grams leading to the M.A. and Ph.D. degrees in
musical composition and in research.
The department’s theory courses provide an in-
troduction to the materials of musical composition
through ear training, harmony, counterpoint, and
analysis. The history and literature courses present
a comprehensive survey of the evolution of West-
ern music and detailed study of the chief periods of
its development. Courses in ethnomusicology pro-
vide study of specific areas of world music, both in
survey and in depth, and also provide an intro-
duction to the principles and methods of research.
Courses in performance (including orchestra, cho-
rus, and various ensembles) offer the opportunity
to perform standard repertoire as well as new or lit-
tle-known works, 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 appoint-
ments.
Students who plan to major in music or take any of
the courses listed for majors under Group II must
take the music placement examination, which is of-
fered each year in the week before instruction be-
gin s, as announced in the Schedule of Classes and the
Department of Music Brochure for music majors.
This placement examination determines admissi-
ion to the major as well as placement in or ex-
emption from the musicianship and harmony se-
quences. The examination may be taken on an ad-
visory basis. The Department of Music Brochure
may be obtained by writing or calling the Depart-
ment of Music office.
Prospective music majors are encouraged to begin
the music program early, preferably in their fresh-
man year. Pre-major advisers and all members of
the faculty are available throughout the year to con-
sult with students interested in the music program.
The Major
Lower Division
During the first two years, students receive training
in musicianship and harmony. Advanced place-
ment in this sequence (or exemption from it) is de-
termined by the music placement examination.
Students lacking basic keyboard skills will also
participate in a small group piano class. Students
are encouraged to begin the upper division Per-
formance Requirement (a) in their first or second
year of study.
Graduate Programs
The Department of Music offers programs leading
to the M.A. and Ph.D. degrees, with specialties in
composition or in scholarship and criticism, in-
cluding the history of music, music analysis, and eth-
nomusicology (not in music education or perfor-
mancc). All students working for the Ph.D. degree
are required to serve as graduate student instruc-
tors for one year. Applications for admission are
considered only once a year for the fall semester;
the deadline for application is January 5. Applicants
who are accepted for the department placement ex-
aminations in music history and theory (harmony,
counterpoint, dictation, and sight reading), ar-
rangements for taking the exam must be made by
December 13.
Medieval Studies. Please see Index for informa-
tion on Medieval Studies.
Group I
Courses open to all students in the University.
Theory
Lower Division Courses
20A-20B. Basic Musicianship. (2;2) Three class
hours per week. Fundamentals of music, including no-
tation, sight singing, ear training, and beginning linear
analysis. For general students. (F,SP)
25A-25B. Introduction to Music Theory. (4;4)
Three hours of lecture per week. Prerequisites: 20A or con-
sent of instructor. A writing course based on traditional
harmony, voice leading, and vertical analysis. For
general students. Emphasis on written exercises. (F,SP)
Upper Division Courses
115. Introduction to Psychoacoustics. (4) Three
hours of lecture per week. Prerequisites: 27 or consent
of instructor. A review of the sensory, perceptual and
cognitive foundations of hearing, performing, and com-
posing. Topics include: relations among various acous-
tical, perceptual characteristics of sound; percep-
tions of pitch, time, timbre, consonance and dissonance,
and auditory space; auditory source identifi-
ation, auditory stream segregation, perceptual
grouping mechanisms; perceptual principles for or-
chestration. (SP) Weisell
116. Jazz Theory and Musicianship. (4) Two 2-
hour lecture per week. Prerequisites: Audition. A sys-
tematic study of jazz theory including chord and scale
construction, chord progression, and chord substi-
tution, applied to playing, singing, transcribing, and au-
nal identification of scales, patterns, chords, melodies,
rhythms, keyboard voicings, and improvisation. Mat-
erials will be drawn from jazz music, 1940 to the pre-
sent. (SP) Dana
History and Literature
Lower Division Courses
27. History of Western Music. (4) Two 1-hour
lectures, one 1-hour discussion section, and one 1-hour dis-
cussion section per week. Prerequisites: 27 or consent
of instructor. The evolution of styles of Western music
from 1600 to the present. (F) Newcomb
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
readings and term papers or projects.
127. History of Western Music. (4) Two 1-hour
lectures, one 1-hour discussion section, and one 1-hour dis-
cussion section per week. Prerequisites: 27 or consent
of instructor. The evolution of styles of Western music
from 1600 to the present. (F) Newcomb
128B. Beethoven. (4) Three hours of lecture and one
1-hour discussion section per week. Prerequisites: 27 or
consent of instructor. Emphasis on the symphonies.
(F) Croker
*128C. Contemporary Music. (4) Three hours of lec-
ture and one 1-hour discussion section per week. Pre-
erequisites: 27 or consent of instructor. Twentieth-cen-
tury music, from Stravinsky to the present.
*129D. J.S. Bach. (4) Three hours of lecture and one
1-hour discussion section per week. Prerequisites: 27 or
consent of instructor.
128E. Mozart and Haydn. (4) Three hours of lecture
and one 1-hour discussion section per week. Prerequi-
tives: 27 or consent of instructor. (SP)
*128F. Music of Johannes Brahms. (4) Three hours of
lecture and one 1-hour discussion section per week. Pre-
erequisites: 27 or consent of instructor.
*128G. 19th- and 20th-century Symphonic Litera-
ture. (4) Three hours of lecture and one 1-hour dis-
cussion section per week. Prerequisites: 27 or consent
of instructor. Survey of principle literature of the period, from Beethoven to Stravinsky.

*128H. The Piano Concerto. (4) Three hours of lecture and one 1-hour listening section per week. Prerequisites: 27 or consent of instructor. A study of the development of the 19th-century piano concerto.

*128I. Russian Music. (4) Three hours of lecture and one 1-hour listening section per week. Prerequisites: 27 or consent of instructor. Survey of Russian music including liturgical chant, 18th-century folk music sources, and art music from the 18th century into the 20th century.

*128J. Music from the Middle Ages to the High Renaissance. (4) Three hours of lecture and one 1-hour listening section per week. Prerequisites: 27 or consent of instructor. A study of selected repertories from the 14th to the 17th centuries.

*128K. Wagner. (4) Three hours of lecture per week. Prerequisites: 27 or consent of instructor. The interaction of music and drama in representative scenes from Wagner's operas through The Twilight of the Gods. Readings from Baudelaire to Adorno will illuminate Wagner's influence on 20th-century culture.

*130A. Studies in the Carillon. (4) Two 1/2-hour lectures and one 1/2-hour laboratory per week. Prerequisites: 25A and 127 or knowledge of basic music history and theory or consent of instructor. A survey of the history and development of the carillon and its music. A discussion and analysis of the major national schools of carillon writing and performing with emphasis on the North American carillon movement in the twentieth century.

Ethnomusicology

Lectures, listening assignments, and readings in translation, with live or videotaped performance demonstrations. Laboratory sections offer practical experience performing on instruments indigenous to the culture studied. No previous musical experience is required.

Lower Division Courses

30. Issues of Ethnicity from a Musical Perspective. (4) Three hours of lecture plus field work lab per week. Focus on issues of ethnicity raised in the field of ethnomusicology, ranging from compartmentalization vs. synthesis of traditions, music as an identity marker, elite vs. non-elitist valuation, and cultural preservation. The course will include a field research component focusing on public celebrations of ethnicity, in order to relate theory to the lives of California ethnic groups. (F) Wade

Upper Division Courses

*130A. Afro-American Music. (4) Three hours of lecture and one hour of discussion per week. Study of the Afro-American music tradition from its West African origins to the various forms at the end of the 19th century.

*130B. Afro-American Music. (4) Three hours of lecture and one hour of discussion per week. Historical and analytical study of Afro-American music in the 20th century. Emphasis on the evolution of jazz and various forms of popular and religious music.

132. Music of the Middle East. (4) Three hours of lecture per week. Music of the Middle East, including folk art, popular and religious music of the Pan-Islamic and Israelit is traditions. (SP) Brinner

133A. Music of the Southeast Asia Tradition. (4) Three hours of lecture and one hour of laboratory per week. Surveys the musics of Indonesia (Java and Bali), Thailand, Cambodia, Laos, Malaysia, and the Philippines—cultures which share instrument types but have developed distinctive musical styles. (F) Brinner

*133B. Music of India. (4) Three hours lecture and one hour laboratory per week. Includes the classical music traditions of both North and South India (Hindustani and Karnatak musics). Emphasis on classes listening.

*134A. Music of the East Asia Tradition. (4) Three hours of lecture and one hour of laboratory per week. Surveys the musics of China, Tibet, Korea, Vietnam, and Japan—cultures which share instrument types but have developed distinctive musical styles.

134B. Music of Japan. (4) Three hours of lecture and one hour of laboratory per week. Traditional classical music of Japan: Shinto ritual music, the imperial court orchestral music and dance, biwa and shakuhachi music, chamber music for shamisen and koto, theatrical genres of kabuki and noh. Reading in music and pertinent Japanese literature in translation. (SP) Wade

Performance

Admission to all performance courses is determined by audition, as listed in the Schedule of Classes. All courses in this group may be repeated for credit. Performance courses should be taken in a two-semester sequence beginning in fall.

Upper Division Courses

140. Javanese Gamelan. (2) May be repeated for credit. Two 2-hour rehearsals per week. A performing course for the study and practice of Indonesian music and instruments. (F,SP) Widijanto

141. University Symphony Orchestra. (2) May be repeated for credit. Two 2-hour rehearsals per week. Prerequisites: Audition. May be taken for credit or audit. (F,SP) Senturia

*142. University Concert Band. (2) May be repeated for credit. Two 2-hour rehearsals per week. Prerequisites: Audition. Performance of wind and percussion repertory by groups of varying sizes will be covered by this course. May be taken for credit or audit.

144. University Chorus. (2) May be repeated for credit. Two 1 1/2-hour rehearsals and one 1-hour section per week. Prerequisites: Audition. The University Chorus primarily performs major works for chorus and orchestra. (F,SP) Kuzma

145. University Chamber Chorus. (2) Course may be repeated for credit. Two 2-hour rehearsals per week. Prerequisites: Audition. A smaller mixed chorus that aims at a professional standard of ensemble singing and explores the lesser-known choral repertoire. (F,SP)

146. Chamber Music Ensemble. (2) May be repeated for credit. Two 2-hour rehearsals per week. Chamber music for strings, winds, piano, percussion, and voice. (F,SP) Crowden, Guggenheim, Pollock

147. Contemporary Chamber Music Ensemble. (2) May be repeated for credit. Two 2-hour rehearsals per week. Performance of West African music with particular emphasis on the music of Ghana. Practical instruction in traditional instrumental and vocal techniques. (F,SP) Ladezko

149. Collegium Musicum. (2) May be repeated for credit. Two 2-hour rehearsals per week. Performance of Renaissance and Baroque music for voices and instruments.

Group II

Courses primarily for students whose major subject is music.

Note: Musicianship (A-B-C-D), Harmony (1A-1B-2A-2B), and Elementary Piano (40SA-40SB-40SC-40SD) are all prerequisites to the major and must be taken concurrently unless the requirement is satisfied by examination.

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall

Lower Division Courses

A-B. Musicianship. (3,3) Three 1-hour meetings per week. Prerequisites: Majors only; A is prerequisite to B. Ear training, sight singing, and dictation. (F,SP) Dana, Davidson, Swackhammer

C. Musicianship. (3,3) Three 1-hour meetings per week. Prerequisites: B; C is prerequisite to C. Prerequisite to D. A continuation of A-B. (F,SP) Dana, Swackhammer

1A-1B. Harmony. (4,4) Three class hours per week. Prerequisites: 1A is prerequisite to 1B. Diatonic harmony, chorale harmonization, and analytical studies. Emphasis will be on written exercises. (F,SP) Staff (Dugger in charge)

2A-2B. Harmony. (4,4) Three class hours per week. Prerequisites: 1B; 2A is prerequisite to 2B. Advanced diatonic, chromatic, and early 20th-century harmony. Emphasis will be on written exercises. (F,SP) Staff (Dugger in charge)

*70A-70B. History of Western Music I. (4,4) Three hours of lecture and one discussion per meeting week. Prerequisites: 1B or consent of instructor.

A. Introduction to music history and criticism, and practice in analytical methods for music of all periods, with emphasis on listening, exercises and papers. The second half of the semester will be devoted to a study of music from ca. 1700-1750. (F)

B. A study of music from 1750-1850. For a continuation, see 170A-170B. (SP) Heartz

Upper Division Courses

150. Instrumental and Vocal Instruction. (1) May be repeated for credit if an average grade of B is maintained. One half-hour laboratory per week. Prerequisites: Must be a music major: Advanced private instruction in keyboard, stringed, woodwind, brass, and percussion instruments and in voice. (F,SP) Senturia

Theory

Upper Division Courses

151. Introduction to Composition. (4) Three class hours per week. Prerequisites: 2B, 154A, and consent of instructor. A study of motive structure, its extension and elaboration, and forms, such as scherzo, sonata, variation, and song, based on eighteenth- and nineteenth-century models. (SP) Dugger

152. Advanced Musicianship. (2) May be repeated once for credit. Three 1-hour meetings per week. Prerequisites: D, 2B, 405D, and consent of instructor. Continuation of the skills acquired in prerequisite courses, with an emphasis on score reading skills (including use of the voice) and the realization of Baroque figured bass lines. Increased emphasis on 20th-century and contemporary practice. (F) Dana

153. Fugue. (4) Three class hours per week. Prerequisites: 154B. A study of subjects, countersubjects, expositions, episodes and stretti, leading to the writing of complete fugues. Regular written assignments required. (F) Liderman

154A-154B. Counterpoint. (4,4) Three class hours per week. Prerequisites: 2B.

A. A study of species counterpoint. Regular exercises in two and three voices required. Group discussion and analysis. (F)

B. A study of 18th-century counterpoint. Regular exercises required. Analysis of chorale preludes, 2- and 3-part inventions, canons, and fugue expositions. (SP) (F) Liderman

155A-155B. Composition. (4,4) Three class hours per week. Prerequisites: 154A-154B. A study of formal problems using twentieth-century compositional materials. (F,SP) Feliciano

156. Studies in Musical Analysis. (4) Three class hours per week. Prerequisites: 2B. The study of various analytical techniques and their application to important works of music. (F) Senturia

*On leave, spring
*Recalled to active service
*Recipient of Distinguished Teaching Award

Music / 295

158. Musical Applications of Computers and Related Technologies. (4) Three hours of lecture per week. Prerequisites: D and 28 or consent of instructor. Basic concepts and techniques of computer-based musical research, composition, and performance. Essentials of digital audio signal processing, musical acoustics and psychoacoustics, sound analysis and synthesis, musical data bases, exploitation of MIDI, computer programming for music, computer-aided music analysis, printing and composition. Works from the computer music repertoire will be examined, as well as the impact of MIDI on information in the music research. (F) Wessel

161. Instrumental Conducting. (4) Two-hour lectures per week. Prerequisites: 28, 152 and 156 recommended. Basic conducting skills and their application to instrumental literature. Emphasis on score-reading, including use of C-ole and reading orchestral transcriptions.

162. Choral Conducting. (4) Two 2-hour classes per week. Prerequisites: 28, 152 and 156 recommended. A study of choral literature of various styles and periods with emphasis on conducting techniques and score reading.

History and Literature
Analytical and historical studies of the music of important composers and periods in the development of Western music. Emphasis on the detailed study of selected representative compositions, through scores, recordings, and assigned readings.

Upper Division Courses

170A-170B. History of Western Music II. (4-4) Three hours of lecture and one discussion section per week. Prerequisite: 170A. The history of the Middle Ages and the Renaissance is a study of music from the Middle Ages to ca. 1700 and 170B, music from ca. 1850 to the present. (F,SP) Crocker, Taruskin

171A. The Performance of Medieval and Renaissance Music. (4) Three class hours per week. Prerequisites: 28 and 708, or consent of instructor; experience in playing an instrument or singing. A study of the music of the Middle Ages and the Renaissance, with emphasis upon performance practices and styles.

171B. Monteverdi. (4) Three hours of lectures per week. Prerequisites: 28 and 708, or consent of instructor.

171C. The Performance of Baroque Music. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor; experience in playing an instrument or singing. A study of music from circa 1650-1750 with emphasis upon performance practices and style.

171D. J. S. Bach. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor.

171E. Purcell. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor.

172A. Mozart. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor.

172B. Beethoven. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor.

172C. Schubert. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor.

172D. The Symphony. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor.

172B. Art Song of the Nineteenth Century. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor: A study of the 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: 28 and 708, 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: 28 and 708, or consent of instructor. A study of symphonic and chamber works selected from the tradition of German instrumental music that led through Schubert and Schumann to Brahms.

174A. Debussy and Mahler. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor. A comparison of selected orchestral works of Debussy and Mahler. Class performance, using four-hand piano editions.

174B. Studies in Twentieth-Century Music. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor. A study of representative compositions from each major development of music in the 20th century.

174C. Stravinsky. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor.

174F. Studies in Afro-American Music. (4) Three hours of lecture per week. Prerequisites: 28 and 130B, or consent of instructor. Detailed analysis of specific musical forms and study of their historical development. Unique aspects of the musical organization, improvisational techniques, and value system will be explored. (F) Wilson

176. The History of the Organ. (4) Three hours of lecture per week. Prerequisites: 28 and 708, or consent of instructor. The history of the organ with emphasis on the development of national styles. The unique instruments in the Music Department's collection will be studied in detail.

Honors and Special Studies Courses

Upper Division Courses

H195. Honors Course. (2-4) May be repeated for credit. Prerequisites: Consent of instructor, student's advisor, and honors program advisor. Attendance at seminar offered during the Fall Semester and completion of a thesis, or, in exceptional cases, supervised independent study projects. Students must complete a minimum of four units in order to receive departmental honors. Recommended for seniors with an overall GPA of 3.3 and 3.3 in the major. (F,SP) Crocker

198. Group Special Study for Advanced Undergraduates. (2-4) May be repeated for credit. Must be taken on a passed/not passed basis. Not to serve in lieu of regular courses of instruction. (F,SP)

199. Supervised Independent Study and Research. (1-4) May be repeated for credit. Must be taken on a passed/not passed basis. Not to serve in lieu of regular courses of instruction. Enrollment is restricted by regulations listed on pages 91-92 of this catalog. (F,SP)

Graduate Courses

Students must obtain consent of instructor before enrolling in any graduate courses.

200A. Introduction to Music Scholarship I. (2) One and a half class hours per week. Formerly Music 200. Principles of music bibliography, techniques of library research, sources of information on music, problems in bibliography and description, presentation of results in written and oral forms. (F) Roberts

200B. Introduction to Music Scholarship II. (4) Three class hours per week. Formerly Music 200. Principles and methods of scholarly research in Western art music, especially history and criticism of music; use of documents, and design of projects. Presentation of results in written and oral forms. (F) Taruskin

200C. Introduction to Music Scholarship III. (4) Three class hours per week. Introduction to issues and methods in ethnomusicology, from the perspectives of both the social sciences and music. Presentation of results in written and oral forms. (SP) Wade

201. Workshop in Electronic Music. (4) Course may be repeated for credit. One 3-hour class meeting and nine hours of laboratory per week. A study of computational machine skills necessary to operate the analog equipment in the electronic music studio; practical application of instrumental acoustics to the available equipment; compositional assignments.

202. Seminar in Contemporary Music. (4) Course may be repeated for credit. Three class hours per week. Studies in 20th-century music. (F,SP) Wilson, Laderman

203. Seminar in Composition. (4) Course may be repeated for credit. Three class hours per week. Prerequisites: Limited to advanced students of composition. A study of relevant problems and compositional techniques. Original compositions required of students. Group discussion and criticism. (F,SP)

204. Studies in Musical Analysis. (4) Course may be repeated for credit. Three hours of lecture per week. The application of analytical principles to a group of compositions and the intensive study of at least one major work. (SP)

206. Organology. (4) Three class hours per week. A study of musical instruments from diverse perspectives including physical characteristics, classification systems, symbolism, iconography, and performance techniques.

207. Tonal Composition. (4) Course may be repeated for credit. Three hours of seminar per week. A composition course dealing with writing and analytical problems posed by a contemporary understanding of tonal materials. (F) Duggar

210. Preseminar in Music History. Three class hours per week. Studies in the history and literature of Western music, dealing with representative composers, music, and topics. The courses listed below will be given in rotation.

210A. Gregorian and Medieval Chant. (4)

210B. Medieval Polyphony. (4) (SP) Crocker

210C. The Sixteenth Century. (4) (F) Kerman

210D. The Seventeenth Century. (4) (F) Curtis

210E. The Eighteenth Century. (4) (SP) Heartz

210F. The Nineteenth Century. (4) (F) Kerman

210G. The Twentieth Century. (4) (F)

211. Musical Paleography. (4) Three class hours per week. Treatment of musical documents, especially from European Middle Ages and Renaissance, with emphasis on systems of notation.

212. Seminar: Medieval Studies. (4) Course may be repeated for credit. Three hours of lecture per week. A highly specialized study of medieval music. The topic will change each time the course is offered. (SP) Crocker

213. Seminar: Studies in the Sixteenth Century. (4) Course may be repeated for credit. Three class hours per week. A highly specialized study of sixteenth-century music. The topic will change each time the course is offered.

216. Seminar: Studies in Baroque Music. (4) Course may be repeated for credit. Three class hours per week. A highly specialized course in Baroque music. The topic will change each time the course is offered.

217. Seminar: Studies in Classical Music. (4) Course may be repeated for credit. Three class hours per week. A highly specialized study in Classic music. The topic will change each time the course is offered.

218. Seminar: Studies in Romantic Music. (4) Course may be repeated for credit. Three class hours per week. A highly specialized study in Romantic music. The topic will change each time the course is offered.
219. Seminar: Jazz. (4) Course may be repeated for credit. Three class hours per week. A highly specialized course that will change each time the course is offered. (SP) Wilson

220. Seminar: Problems in Criticism. (4) Course may be repeated for credit. Three class hours per week. A specialized course in musical criticism. The topic will change each time the course is offered.

222. Seminar: Studies in Russian Music. (4) Course may be repeated for credit. Three class hours per week. A highly specialized study in Russian music. The topic will change each time the course is offered.

225. Introduction to Modern Music Theory. (4) Three class hours per week. Theoretical models for tonal and atonal music; conceptual basis and application of the work of Schoenberg, Babbitt, Forte, Perle, and others.

230. Historical Readings in Ethnomusicology. (4) Three class hours per week. Formerly 235A. Readings of significant works in the history of the field. Selection drawn from the multiple disciplines involved in the study of music.

231. Current Readings in Ethnomusicology. (4) Three class hours per week. A highly specialized course in the field. The topic will change each time the course is offered.

232. Topics in Ethnomusicology. (4) Course may be repeated for credit. Three class hours per week. Formerly 235B. Readings of the most significant current work in the field. Selections drawn from the multiple disciplines involved in the study of music.

234. Ethnomusicological Methods: Transcription. (4) Formerly 238B. Three class hours per week. An introduction to the techniques of transcription as a method of documenting, notation, transcription.

235. Ethnomusicology Methods: Field Research. (4) Course may be repeated for credit. Three hours of lecture per week. Formerly Music 238A. Techniques, equipment, research and data collection, analysis, documentation, notation, transcription.

250. Colloquium. (1) May be repeated for credit. 5 credit hours of approved coloquium for advanced graduate students. The course may be repeated for credit.

291A. Oral Performance: Noetics and Poetics. (4) Course may be repeated for credit. Three hours of lecture per week. Formerly 291A. Techniques, equipment, research and data collection, analysis, documentation, notation, transcription.

298. Group Special Studies. (2-8) May be repeated for credit. Meetings to be arranged according to unit hours. A highly specialized course in support of major, available from members of the Department of Ethnic Studies. An advanced graduate seminar; independent reading; performance traditions organized and managed knowledge.

299. Special Study. (2-12) May be repeated for credit. Meetings to be arranged according to unit hours. A highly specialized course in support of major, available from members of the Department of Ethnic Studies.

601. Individual Study for Master's Students. (1-8) May not be used for unit or residence requirements for a master's degree. May be repeated for credit. Meetings to be arranged according to unit hours. Must be taken on a satisfactory/unsatisfactory basis.

602. Individual Study for Doctoral Students. (1-8) May not be used for unit or residence requirements for the doctoral degree. May be repeated for credit. Meetings to be arranged according to unit hours. Must be taken on a satisfactory/unsatisfactory basis. Studies 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. Three class hours per week. An introduction to successful teaching principles as demonstrated by successful and unsuccessful teaching assignments. Prerequisites: Consent of instructor. (F,SP)

405A-405B. Elementary Piano. (1;1) One class hour per week. A highly specialized course in the study of music. Prerequisites: Open only to majors in music. (F,SP)

405C-405D. Elementary Piano. (1;1) One class hour per week. Must be taken on a satisfactory/unsatisfactory basis with emphasis on the teaching of fundamentals. Prerequisites: Open only to majors in music. (F,SP)

410A-410B. Vocal Technique. (1;1) One class hour per week. A course in basic vocal techniques, primarily for students in the University Choruses, covering techniques of breathing, pronunciation, articulation. (F,SP) Restell

Interdepartmental Studies Courses

Upper Division Courses

IDS 135. Mozart and Beaumarchais: The Figaro Cycle. (4) Prerequisites: Three hours of lecture per week. A highly specialized course in support of major, available from members of the Department of Ethnic Studies. An advanced graduate seminar; independent reading; performance traditions organized and managed knowledge.

Native American Studies

(Special Studies or College of Letters and Science)

Program and Major Office: 3415 Dwinelle Hall, 642-6717 Coordinator: Terry P. Wilson, Ph.D.

Professor:

*IDS 135. Mozart and Beaumarchais: The Figaro Cycle. (4) Prerequisites: Three hours of lecture per week. A highly specialized course in support of major, available from members of the Department of Ethnic Studies. An advanced graduate seminar; independent reading; performance traditions organized and managed knowledge.

Native American Studies Program exists to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (F,SP)

Choice of Program

A student can complete the major in Native American Studies in the College of Letters and Science (A.B. degree) or in the Department of Ethnic Studies (A.B. degree). Students in each program are subject to the requirements of the respective college or department.

The Major

The major program in Native American Studies leads to an A.B. degree. Admission to the program requires a letter of application from an 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 during the first year. All courses must be completed with a grade of "C" or better. Students will be required to outline their academic and professional goals.

Requirements

1. University Requirements. (a) Completion of 120 units, at least 36 of which must be in upper division courses; (b) Maintenance of at least a 2.0 grade-point average; (c) Completion of senior residence, Subject A, and American History and Institutions requirements.

2. Major Requirements. (a) 50: Native Americans in Contemporary Society; (b) 71A-71B: History of Native Americans in North America; (c) Ethnic Studies 102 or 21; (d) 101: Native American Sovereignty; (e) ES194: Quantitative Methods of Community Research or ES195: Selected Issues in Third World Research; (f) 15 units of upper division NAS courses; (g) three upper division courses supportive of major. One course from Ethnic Studies Group Major. Two courses from outside NAS and the Department of Ethnic Studies. Courses in support of major, available from main courses in the History program. All courses must be approved by an academic advisor.

3. Breadth Requirements—Special Studies (for College of Letters and Science breadth requirements, see the college announcement). (a) 1A and 1B: Native American Studies Reading and Composition (or an equivalent); (b) two courses outside the major; (c) Natural Science: one course; (d) three upper division courses outside the major and Ethnic Studies Department.

The Honors 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 degree with honors, students are required to undertake a 3-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

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.

Lower Division.

One course: Native American Studies 50, 71A, 71B.

Upper Division.

Five courses: Sovereignty: Native American Studies 101; History: one course: Native American Studies 175, 176, 177; Electives: Three courses in Native American Studies.

Lower Division Courses

1A. Native American Studies Reading and Composition. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Satisfaction of Subject A requirement. Expository composition directed to the needs of Native American students. The writing requirement shall be set at a norm of 8,000 to 10,000 words per semester; a minimum of 8,000 words is to be divided among six to eight papers in each half of the requirement. (F) Molesky

1B. Native American Studies Reading and Composition. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1A; Satisfaction of Subject A requirement. Continued emphasis on development of essay writing in expository composition with increased attention to Native American literary traditions. The writing requirement shall be set at a norm of 8,000 to 10,000 words per semester; a minimum of 8,000 words is to be divided among six to eight papers in each half of the requirement. (SP) Kidwell

50. The Native American in Contemporary Society. (4) Three hours of lecture per week. Analysis of political issues and problems of Native Americans on reservations and in urban areas. Major topics: the Bureau of Indian Affairs, the U.S. Public Health Service, the relocation system, the reservation system, discrimination, urban life, Indian organizations, stereotypes, the "New Indian." (F,P) Biestman

52. Native American Creative Writing Workshop. (3) Three hours of lecture per week. Prerequisites: 1A, 1B, or consent of instructor. Native American literary forms and presentation in storytelling, oratory, drama, etc. Development of creative writing skills using those forms and presentations as a basis for expression.

71A. History of Native Americans in North America. (4) Three hours of lecture per week. History of the origins of native people in North America, discussion of the diversity of Native American cultures and commodity of value systems of those cultures; consideration of the impact of European contact to 1776. (SP) Black

71B. History of Native Americans in North America. (4) Three hours of lecture per week. Prerequisites: 71A or consent of instructor. Course deals with the political, cultural, legal, and military relationships between the various American Indian tribes and the U.S. Government from 1776 to the present. (SP) Wilson

98. Supervised Group Study and Research. (1-3) Course may be repeated for credit. To be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Limited to Freshmen and Sophomores. Supervised research by lower division students. (F,P) Biestman

Upper Division Courses

101. Native American Sovereignty. (3) Three hours of lecture per week. Prerequisites: 71A, 71B, or consent of instructor. Examination of Native American rights as a product of the history of Anglo-American economic, legal, political, social, and intellectual thought. This course examines property rights, political choice, and cultural identity from the prehistoric period to historical phases from the colonial period to the present. (SP) Faustett

103. Survey of Native American Tribal Government. (3) Three hours of lecture per week. Analysis of the development of tribal government and policy including political institutions, the tribal society, intertribal alliances, and effects of European contact. (SP) Faustett

104. Native American Economic Development. (3) Three hours of lecture per week. Prerequisites: 71A or consent of instructor. Analysis of impact of U.S. economic policies on tribal lands and resources. Examination of the effect of federal legislation, BIA regulations, and tribal economic development. Consideration of alternative strategies of development.

110. Introduction to Research Problems of Native American Communities. (3) Three hours of lecture per week. Prerequisites: 71A or consent of instructor. This course is designed to establish a familiarity with the methodology and logic of social research, from origin through development of a research topic. Emphasis is on social science methodology, theory, assumptions, and problem solving.

111. Proposal Writing for Native American Communities. (3) Three hours of lecture per week. Prerequisites: 71A, 71B, or consent of instructor. This course is designed to address special problems as well as alternative approaches to topic definition of research development in NAS research through writing and submission of proposals.

151. Native American Philosophy. (4) Three hours of lecture per week. Prerequisites: 71A or consent of instructor. A study of the philosophical and metaphysical aspects of Native American world views, with emphasis on systems of knowledge, explanations of nature, and corporate interests on tribal economic life. Consideration of value systems of those cultures; consideration of the cultural background of Native American poetry and poets.

153. Native American Poetry. (3) Three hours of lecture per week. Prerequisites: 71A, 71B, or consent of instructor. A study of Native American poetry from ethnographic sources and contemporary writers. Consideration of Native American poetry as literature within traditional and alternative definitions of the word, and of the cultural background of Native American poetry and poets.

154. Mythic Tribal Literature. (3) Three hours of lecture per week. Prerequisites: 50. Chronicles and commentaries on published texts and the problems of tribal literature in translation. The cult of cultural tribal artifacts in contrast to the oral performing dreams and telling mythic tales. Perusal of historic speeches, trickster narratives, ororal and prophetic tribal epics. (SP) Vizenor

155. Native American Medicine. (4) Three hours of seminar per week. Prerequisites: 71A, 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) Kidwell

156. Native Americans and the Cinema. (3) Three hours of lecture per week. Prerequisites: 71A, or consent of instructor. This course will analyze the social, psychological, and literary aspects of Hollywood moviemakers' stereotyping of the American Indian through the history of film. The format will include representative Indian films, lectures, and guest speakers from the movie industry. (F,P) Vizenor

159. Native American Women. (3) Three hours of lecture per week. Prerequisites: 71A or 71B, or consent of instructor. An overview of the role of women in traditional Indian societies and in the modern world. Changes in Indian societies occasioned by contact with Europeans and how these changes have altered sex role definitions will be examined. (SP) Antell

173. History of Indians of the Northeast Woodlands. (3) Three hours of lecture per week. Prerequisites: 71B or consent of instructor. Indian groups and cultures from the eastern seaboard to the St. Lawrence River between the Algonquin and the Iroquois; the development of the Iroquois League; the impact of European contact on the Northeast Woodlands. (F) Black

175. History of Native Americans in the Southwest. (3) Three hours of lecture per week. Prerequisites: 71A, 71B, or consent of instructor. An historical analysis of the Native Americans of the southwest. (SP) Wilson

177. Plains Indian History. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. The development of the Native Americans of the plains and plains Indians. History from archeological sites to the social movements of the 1970's. It will stress the changes evidenced by the tribes as they met the challenges of economic, political, and historical forces. (SP) Antell

182. Native American Music. (3) Three hours of lecture per week. Focuses on the range and variety of musical forms and styles and the relationship of each to other aspects of human activity, belief, and world view. In particular, the relationship of music and ceremonial activities will be emphasized. (SP) Black

190. Seminar on Advanced Topics in Native American Studies. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. Advanced seminar in Native American Studies with topics to be announced at the beginning of each semester. (F,P) Wilson

191. Native American Studies Honors Course. (3) Course may be repeated for credit. To be arranged. Prerequisites: Student must have junior standing; a 3.5 GPA overall; a 3.5 GPA in major; and have been admitted to the honors program by the faculty adviser. The course will entail directed study and completion of an honors research project under the direction of a faculty member. The project should be originated from a regularly scheduled course in the department. (F,P) Wilson

197. Field Work in the Native American Community. (1-3) Course may be repeated for credit if the project varies. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and upper division standing preferred. Individual conferences to be arranged. Supervised experiences relevant to specific aspects of the Native American community in campus settings. Regular individual meetings with facility sponsor and written reports required. (F,P) Wilson

198. Supervised Group Study. (1-3) Course may be repeated for credit if the project varies. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and upper division standing preferred. Individual conferences to be arranged. Group discussion, research, and reporting on topics by students. (F,P) Wilson

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit if the 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 a topic. In the courses offered in the Program. (F,P) Wilson
Naval Architecture and Offshore Engineering
(College of Engineering)

Department Office: 202 Naval Architecture Building, 642-5464
Chair: Ronald W. Yeung, Ph.D.

Professors:
Robert G. Bea, M.S. Offshore and coastal structures, ocean and coastal engineering. Leads the master's and doctoral degrees. The graduate student must take Naval Architecture and Offshore Engineering 240A-240B, 241A-241B, and 290C. Other courses are chosen according to the student's background and objectives. With sufficient undergraduate preparation, a student may earn a master's degree in two semesters of study. Further details in graduation catalog. (Including the interdisciplinary program in ocean engineering) are available from the department upon request.

Lower Division Courses
10. Ship Systems. (3) Two 1-hour lectures per week. Prerequisites: Mathematics 1A or 1B. Principles of design and operation of ships. Emphasis on system engineering, strength, and stability in intact and damaged conditions. Principles of thermodynamic cycles, resistance, marine propulsion plants, both conventional and nuclear, and auxiliary machinery systems. Current developments in offshore engineering. A field trip. (SP) Webster

Upper Division Courses
151. Statics of Naval Architecture. (4) Two 1-hour lectures and 2-hour lab per week. Prerequisites: Consent of instructor; Mechanical Engineering 106. Dimensional analysis and fundamentals of ship propulsion. Emphasis on model tests and tabulated data. Theories of propeller action and performance of open water propellers. Interaction between propeller and ship. Laboratory experiments in still water resistance of a ship. (F) Webster

152A. Ship Dynamics. (3) Two 1-hour lectures and 4-hour lab per week. Prerequisites: 151 may be taken concurrently; Mechanical Engineering 106. Dimensional analysis and fundamentals of ship propulsion. Emphasis on model tests and tabulated data. Theories of propeller action and performance of open water propellers. Interaction between propeller and ship. Laboratory experiments in still water resistance of a ship. (F) Webster

152B. Ship Dynamics. (3) Two 1-hour lectures and 4-hour lab per week. Prerequisites: 152A. Elementary wave-water theory. Rigidity dynamic loads of ships and offshore platforms. Motions and loads in a seaway. Statistical description of seaway and resulting loads. Laboratory experiments of ship's motion behavior in the ship model tank. Prediction of steering and maneuvering characteristics. (F) Yeung

154. Ship Structures. (3) Two 1-hour lectures per week. Prerequisites: 151 and Civil Engineering 130. Introduction to the specialized features of ship structures and their design. Structural loads, hull girder and hull components analysis, laterally loaded girdles and cross-stringers. Stability of possible failure to be designed against, use of theory and classification society rules in combination in the design process. (F) Mansour

*155A-155B. Ship Design. (4,4) Two 1-hour lectures and three hours laboratory per week. Prerequisites: Statistics 25, or equivalent. Formerly 153 and 155B. To develop a framework for the synthesis of the various ship technologies developed in the prerequisite coursework. Homework and design will be aimed at cultivating the student's judgement in balancing innovation and risk in making design decisions. A year-long ship design project will give the student the opportunity to apply these skills. Faulline, Webster

198. Directed Group Studies for Advanced Undergraduates. (1-4) Units for semester course approved upon discretion of the advisor. May be repeated for credit. To be arranged. Must be taken on a pass/fail basis. Prerequisites: Consent of instructor. Group studies of selected topics which will vary from year to year. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for a maximum of four units per semester. Individual conferences. Must be taken on a pass/fail basis. Prerequisites: Consent of instructor and major adviser. Supervised independent study. Please see pages 91-92 of the General Catalog for description and prerequisites. (F,SP) Staff

Graduate Courses
205B. Wind & Wave Forces on Marine Structures. (3) Two 1-hour lectures per week. Prerequisites: 241A-241B, or Civil Engineering 205A. Determination of wind and wave forces on coastal structures, pipelines, fixed and mobile offshore platforms. Evaluation of nominal and extreme loading. Emphasis on design and stability of marine structures. Time and frequency domain characteristics of wind and wave loads. An introduction to the basics of wind and wave loads. Evaluation of accuracy of analytical models based on field and laboratory data. Also listed as Civil Engineering 205B and IDS 205. (SP)

240A-240B. Theory of Ship Structures. (3,3) Three 1-hour lectures per week. Prerequisites: 152B and 154 or consent of instructor. Hull response and primary vertical, horizontal, and torsional loads. Isotropic and orthotropic-plate theories and their applications to ship hulls and ocean structures. A probabilistic description of ocean waves and wind loads acting on ships and ocean structures, input-output relations, response in long and short crest waves, statistical description of wave loads, analysis of uncertainty in hull strength modes of failure, reliability and design considerations. (F,SP) Mansour, Paulling


290D. Vehicles for Ocean Engineering. (2) Three 1-hour lectures per week. Prerequisites: Graduate standing in Engineering. The construction and design of vehicles for performing engineering functions in the ocean. Topics include environmental, deep ocean tasks, vehicle types, design requirements, motion stabilizations, structural problems. Webster

290E. Design, Construction, and Maintenance of Marine Structures. (3) Two 1-hour lectures per week. Prerequisites: 290A and 290B. Design, construction, and maintenance of marine structures. Topics include environmental, deep ocean tasks, vehicle types, design requirements, motion stabilizations and海洋工程学. (3) Two 1-hour lectures per week. Prerequisites: Consent of instructor. Hull response and primary vertical, horizontal, and torsional loads. Isotropic and orthotropic-plate theories and their applications to ship hulls and ocean structures. A probabilistic description of ocean waves and wind loads acting on ships and ocean structures, input-output relations, response in long and short crest waves, statistical description of wave loads, analysis of uncertainty in hull strength modes of failure, reliability and design considerations. (F,SP) Mansour, Paulling

290E. Design, Construction, and Maintenance of Marine Structures. (3) Two 1-hour lectures per week. Prerequisites: Consent of instructor. Hull response and primary vertical, horizontal, and torsional loads. Isotropic and orthotropic-plate theories and their applications to ship hulls and ocean structures. A probabilistic description of ocean waves and wind loads acting on ships and ocean structures, input-output relations, response in long and short crest waves, statistical description of wave loads, analysis of uncertainty in hull strength modes of failure, reliability and design considerations. (F,SP) Mansour, Paulling
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. Graduating seniors may use this course to pursue advanced study in a subject area. (S,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 highly motivated students to prepare themselves for the various examinations required of candidates for the Ph.D. (and other Doctoral degrees). May not be used for unit or residence requirements for the doctoral degree. (F,SP) Staff

Near Eastern Studies
(College of Letters and Science)

Department Office: 250 Barrows Hall, 642-3757
Chair: Anne D. Kilmer, Ph.D.

Professors:
Hamid Algar, Ph.D. Cambridge University. Islamic and Persian studies.
Robert B. Alter, Ph.D. (Class of 1937) Professor Harvard University. Hebrew literature, modern and biblical.
Guilty Agapiou, Assistant Professor of Classical Literature and Ancient Near Eastern Art, University of California at Berkeley. Near Eastern art.
Ariel A. Bloch, Ph.D. Münster University, Arabic and Semitic, Arabic dialectology, Hebrew.
Daniel Boyadjian, Ph.D. University of Pennsylvania. Classical studies in Talmud and Midrash; gender and sexuality, Hermeneutics.
Wolfgang J. Helmpel, Ph.D. University of Heidelberg. Mesopotamian cultures, Sumerian.
Anna D. Kilmer, Ph.D. University of Pennsylvania. Assyriology; Akkadian, Mesopotamian culture, literature, music.
James T. Monroe, Ph.D. Harvard University. Classical, Assyriology; Syrian-Arabic literature, comparative literature.
Ruggero Stefanini, Dottore in Lettere University of Florence. Arabic literature.
Arabianist Studies.
William M. Brinner, Emeritus. Ph.D. University of California at Berkeley. Islamic institutions; Arabian/Arabic literatures.
Mounah A. Khouri, Emeritus, Ph.D. Harvard University. Hebrew literature, modern and biblical.
Daniel A. Foxvog, Ph.D. University of California at Berkeley. Comparative Semitics, Egyptology, Biblical archaeology, art history.
Wolfgang J. Helmpel, Ph.D. University of Heidelberg. Mesopotamian cultures, Sumerian.

Associate Professors:
Cathleen A. Keller, Ph.D. University of Berkeley. Ancient Egyptian language, history, art.
Martin Schwartz, Ph.D. University of California at Berkeley. Old and Middle Indo-European, Zoroastrianism, poetic and Semitics.
Muhammad Siddiqui, Ph.D. University of Berkeley. Comparative literature, modern Arabic and Hebrew literature.

Assistant Professor:
Chana Krentfeld, Ph.D. University of Berkeley. Hebrew, Yiddish, poetics, stylistics.

Visiting Professor:
David J. Biale, Ph.D. University of California at Los Angeles. Medieval and modern Jewish thought.

Lecturers:
Rotte Adler, M.A. University of California at Berkeley. Linguistics, Hebrew literature, English as a second language.
Daniel A. Alperov, Ph.D. University of Berkeley. Semitic language, literature, religion.
David S. Larkin, B.A. University of Berkeley. Ancient Egyptian language, history, religion.
Jaan Pimaz, Ph.D. University of Berkeley. Modern Hebrew literature, Jewish and secular literature.
Grace M. Smith, Ph.D. University of Berkeley. Turkish literature, cultural history.

Instruction in the Department of Near Eastern Studies is concerned with the languages and civilizations of the ancient, medieval, and modern Near East. The department offers specialized training in archeology, art history, Assyriology, Egyptology, History, Semitics, and Islamic studies, Turkish, Hebrew, Arabic, and Persian. For students in other disciplines, the department provides a wide variety of courses to supplement such related fields as linguistics, history, political science, comparative literature, folklore, and anthropology. Lecture courses offered by the department present a comprehensive body of information on past and present Near Eastern civilizations. Many of the courses taught in the department are restricted to a small number of students and therefore afford an opportunity for close interaction with the instructing staff.

For a description of interdisciplinary graduate programs in which the department participates, please see the Special Programs 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

A. 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.

1. In Arabic, Hebrew, Persian, and Turkish: Pre-requisite: the elementary courses in the language, or their equivalents, that are required of students who have not taken the course at the university level.

The major requires from 21 to 25 upper division language units, depending upon the language undertaken, plus 6 upper division lecture units.

2. In Assyriology and Hittitology, Old and Middle Iranian, Indo-European, Zoroastrianism, poetics and Semitics

The major requires from 18 to 24 upper division language units, plus 6 upper division lecture units in Assyriology.

B. The Major in Ancient Near Eastern Archaeology and Art History

1. Mesopotamian Archaeology. Three lower division courses are required: NES 15, NES 20 or 25, and NES 10 or 15 or 16. The student must complete 28 upper division units including NES 120A-120B and 20 units from the following list: NES 121A-121B, NES 122A-122B, NES 123A-123B, NES 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 courses from any ancient language or art course in the ancient field of Near Eastern studies.

2. Egyptian Archaeology. This option requires that students take NES 101A-101B, 103, 104, 106A-106B, 120A-120B, 121A-121B, 122A-122B, 123A-123B, 124A-124B; Anthropology 134, 135. While it is not required, the department does recommend some background in French, German, and/or Arabic.

Honor Program. With the consent of the under-graduate adviser, a student with an overall grade-point average of 3.3 or higher and a grade-point average of 3.5 or higher in courses completed in the major may apply to admission to the honors program. The requirements of this program include the completion of the honors thesis during the student's senior year. For a complete description of the program, please inquire at the department office.

The Minor

In each of these programs Option A is open to students with little or no background in the language. Option B is for students who have completed the equivalent of two years of university-level course work. Students may pursue the major in Ancient Near Eastern archaeology and art history and a minor in one of the department's language programs, even though both are administered by the Department of Near Eastern Studies; students may not pursue a major in one of the Near Eastern studies languages and a minor in another. For lists of courses which may be taken to fulfill the minor course requirements, please inquire at the department office.

The Minor in Arabic, Option A. Required courses: Arabic 20A-20B (in addition to Arabic 1A-1B). Five upper-division courses: Arabic 100A; two one-semester literature courses (in Arabic); two one-semester courses in Arabic cultures.

The Minor in Arabic, Option B. Required courses: Seven upper-division courses: five one-semester courses in Arabic language or literature (in Arabic); two one-semester courses in Arabic culture/history.


The Minor in Hebrew, Option B. Required courses: Seven upper-division courses: five one-semester courses in Hebrew language or literature (in Hebrew); one one-semester course in Hebrew culture/history.

The Minor in Persian, Option A. Required courses: Persian 1A-1B, Five upper-division courses: Persian 100A-100B; Persian 101A-101B; a one-semester course in Persian culture/history.

The Minor in Persian, Option B. Required courses: Seven upper-division courses: five one-semester courses in Persian literature (in Persian); two one-semester courses in Persian culture/religion.

The Minor in Turkish, Option A. Required courses: Turkish 1A-1B. Five upper-division courses: Turkish 100A-100B; Turkish 101A-101B or Turkish 102A-102B; a one-semester course in Turkish culture/history.

The Minor in Turkish, Option B. Required courses: Seven upper-division courses: five one-semester courses in Turkish literature (in Turkish); two one-semester courses in Turkish culture/history.

Graduate Program

Graduate programs leading to the M.A. and Ph.D. degrees are offered in the following languages and literatures: Arabic, Hebrew, Persian, and Turkish. The same degrees are also offered in the following fields of Near Eastern archaeology, art history, cuneiform, Biblical and Judaic studies, Old Iranian studies, comparative semetics, Egyptology, and Islamic studies.

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 and Plan II as outlined below. A complete description of Graduate Division requirements for this degree is found in the Graduate Education section of this catalog. In addition to the requirements outlined for 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: Program in archaeology and art history. This plan requires an M.A. thesis and 20 units of course work.
Near Eastern Studies

Courses listed under Near Eastern Studies are taught in English. Courses listed under language headings are language courses and assume an appropriate level of knowledge of that language.

*Not offered 1991-92
*On leave, spring
*On leave, fall

42. Introduction to Sufism. (3) Three hours of lecture per week. Survey of Islamic mysticism, its principles, and historical expression.

Upper Division Courses

101A-101B. History of Ancient Egypt. (4;4) Three hours of lecture and one hour of discussion per week. Prerequisites: 18 or equivalent, or consent of instructor. The art and archaeology of the civilizations of Ancient Egypt from Prehistoric times down to the conquest of Alexander the Great. Particular attention will be paid to the textual record and problems of its interpretation.

102A-102B. Archaeology of Ancient Egypt. (4;4) Three hours of lecture and one hour of museum section per week. Prerequisites: 18 or equivalent or consent of instructor. Archaeological materials available for the reconstruction of Egyptian culture and society. A. Early prehistory through the First Intermediate Period. B. The Middle and New Kingdoms. Special emphasis will be given to current archaeological theories and recent discoveries. Extensive use will be made of the Lowe Museum Collection.

103. Religion of Ancient Egypt. (3) Three hours of lecture per week. Prerequisites: 18 or consent of instructor. The religious and cultural background and present status of the ethnic and religious groups in the Arab states, Turkey, Israel, and Iran.

105A-105B. Ancient Mesopotamian Documents and Literature. (3;3) Three hours of lecture per week. Representative survey of the written sources of the ancient Mesopotamians, based primarily upon the written sources.

106A-106B. Art and Architecture of Ancient Egypt. (4;4) Three hours of lecture and one hour of discussion per week. Prerequisites: 18 or equivalent, or consent of instructor. Style and technique of Egyptian art and architecture from Predynastic times through the end of the pharaonic period. Discussion sections will focus upon Egyptian material in the Lowie Museum collection. NES 103A will cover the period from Predynastic times until the end of the First Intermediate Period (c. 5000-2000 BC).

107. Ancient Egyptian Literature and Documents. (3) Three hours of lecture per week. Prerequisites: 18 or equivalent or consent of instructor. Historical and thematic survey of the major genres of ancient Egyptian literature from the Old Kingdom through the Graeco-Roman Period (c. 2500 BC - 1st century AD). Special attention will be paid to the social relevance and stylistic characteristics of the documents discussed.

120A-120B. Near Eastern Art. (4;4) Three hours of lecture and one hour of discussion per week. 120A: The Neolithic through the Kassite period. 120B: The Iron Age through Sasanian times.

121A-121B. Islamic Art. (4;4) Three hours of lecture and one hour of discussion per week. Topics in Islamic art and architecture from the rise of Islam to the present.

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.

123A-123B. Mesopotamian Archaeology. (4;4) Three hours of lecture and one hour of discussion per week. A survey of the archaeology of Mesopotamia.

124A-124B. Archaeology of the Eastern Mediterranean. (3;3) Three hours of lecture per week. The aim of this course is to investigate specific archaeological problems by means of a general survey of archaeological sites in Cyprus, Jordan, Israel, and Syria.
The time period covered will be Ceramico/Late Neolithic-Middle Bronze (about 5000 - 1600 BC).

130A-130B. History of Ancient Israel. (3,3) Three hours of lecture per week. The patriarchal age through the Hellenistic period.

131. Aspects of Biblical Religion. (3) Three hours of lecture per week. The teachings of ancient Israel's priests, prophets and sages on various universal problems.

132. Judaism and Hellenism. (3) Three hours of lecture per week. The analysis of the impact of Hellenism on Judaism. A detailed study of various apocalyptic and pseudopeopigraphical Alexandrian writings. Special attention will be given to Wisdom Tradition and the philosophical works of Philo Judaeus and their relationship to Greek philosophy and early Christianity.

133. Judaism in Late Antiquity. (3) Three hours of lecture per week. The emergence and development of classical Judaism, its piety, institutions, thought, and literature.

134. Talmud and Midrash in Translation. (3) Three hours of lecture per week. Reading in translation and discussion of a selection of Talmudic Midrashic literature, their use for a history of Jewish thought and their historical development and place within the broader Jewish and general context (1st - 8th centuries Common Era).

137. Modern and Contemporary Jewish Thought. (3) Three hours of lecture 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, Heeschel.

140. Topics in Islamic Thought and Institutions. (3) Course may be repeated for credit. Three hours of lecture per week. Selected topics from Islamic intellectual history.

141. Modern and Contemporary Islamic Thought. (3) Three hours of lecture per week. A survey of leading Muslim thinkers and movements of the past two centuries.

142. Shi'ite Islam. (3) Three hours of lecture per week. The beliefs, traditions, and practices of the Shi'ite school of Islam.

143A-143B. Islam in Iran. (3,3) Three hours of lecture per week. A general survey of the religious history of Iran in the Islamic period, covering the rise and development of religious institutions, the elaboration of the religious sciences, Sufism, and sectarian movements.

144. Introduction to Islamic Law. (3) Three hours of lecture per week. The origins and evolution of the legal precepts of Islam.

145. Islamic Bibliography. (3) Course may be repeated for credit. Three hours of lecture per week. A survey of primary sources in the Islamic religious sciences.

150A-150B. Arabic Literature in Translation. (3,3) Three hours of lecture per week. A Survey of Arabic literature from its origins in pre-Islamic poetry through its historical development during the Umayyad, and Abbasid periods. No knowledge of Arabic is required.

B. Survey of Arabic literature in its development from the post-Abbasid period to the present. No knowledge of Arabic is required.

150. 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.

161. Introduction to Comparative Study of Iranian Languages. (3) Three hours of lecture per week. Prerequisites: Consent of Instructor. Survey of the languages of the Iranian branch of the Indo-European family of languages.

162A-162B. History of Persian Literature. (3,3) 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.

170A-170B. Turkish Literature in Translation. (3,3) Three hours of lecture per week. Surveys aspects of the civilization and culture of the Ottoman Empire (14th - 15th century). Emphasis on reading and interpreting original sources (in English). Topics include religion, slavery, holy war, class structure, legal institutions, and response to change.

172. Turkish Sufi Literature. (3) Three hours of lecture per week. An introduction to the study of Turkish Sufism and its major literary works. No knowledge of Turkish is required.

H195. Senior Honors. (2-4) Must be taken on a passed/not passed basis. Prerequisites: Required to senior honors candidates. Directed study centering upon preparation of an honors thesis.

198. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Variable meetings. Instruction in areas not covered by regularly scheduled courses: Phenician, Cyriote, Syrian Archeology.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Enrollment restricted by regulations shown in the General Catalog.

Graduate Courses

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 specific aspects of the arts of Western and Central Asia. Topic to be announced at first meeting seminar. Students who take two semesters in succession may be assigned credit and grade at the end of the sequence.

221A-221B. Seminar in Islamic Art. (4,4) Course may be repeated for credit. One 3-hour meeting per week. Prerequisites: Consent of instructor. Topics will vary according to student interest.

222A-222B. Topics in Near Eastern Art and Archaeology. (4,4) Course may be repeated for credit. Students who take two semesters in succession may be assigned credit and grade at the end of the sequence. Prerequisites: Consent of instructor. Topic to be announced at first meeting seminar. Students who take two semesters in succession may be assigned credit and grade at the end of the sequence. Prerequisites: Consent of instructor. Course to be taught jointly by two members of the staff. Seminar on the comparative study of the art and archaeology of the Ancient Near East in the first millennium B.C.

223A-223B. Seminar in Near Eastern Archeology. (4,4) Course may be repeated for credit. One 3-hour meeting per week. Research into a major aspect or problem of Mesopotamian archaeology.

224A-224B. The Archaeology of Israel and Jordan. (3,3) Course may be repeated for credit. One 3-hour seminar per week. Prerequisites: 102A-102B or 123A-123B or 124A-124B or consent of instructor. Study of selected sites which illustrate issues, problems or methods in archaeological research. Emphasis on results of archaeological research for understanding the history and culture of people living in these lands during:

A. Early, Middle, and Late Bronze Ages (ca. 3000-1200 B.C.)
B. Iron Age, the Persian, Hellenistic and Roman periods (ca. 1200 B.C. - A.D. 135).

290. Special Studies. (1-5) Course may be repeated for credit. Prerequisites: Consent of instructor.

Students may enroll in more than one section of 290, but the total number of units of Special Study in any one semester may not exceed 12.

290A. Near Eastern Studies. (1-5) Variable.

290B. Arabic. (1-5) Variable.

290C. Cuneiform. (1-5) Variable.

290D. Egyptian. (1-5) Variable.

290E. Hebrew. (1-5) Variable.

290F. Iran. (1-5) Variable.

290G. Semitics. (1-5) Variable.

290H. Turkish. (1-5) Variable.

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. Prerequisites: Successful completion of Ph.D. qualifying exams, limited to students engaged in research for the doctoral dissertation.

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Prerequisites: Successful completion of Ph.D. qualifying exams, limited to students engaged in research for the doctoral dissertation.

Arabic

Lower Division Courses

1A-1B. Elementary Standard Arabic. (5,5) Formerly Arabic 2A, 5A-5B, FIVE 1-HOUR REPEATED SESSIONS PER WEEK. A presentation of literary Arabic, leading to the reading of a variety of classical and modern texts.

17A-17B. Readings in Current Arabic Newspapers. (2,2) Course may be repeated for credit. Two hour lecture and recitation per week. Must be taken on a passed/not passed basis. Prerequisite: 1A-1B. Reading of current Arabic newspapers from various countries. Emphasis is on acquiring skill in rapid reading of
this genre and in vocabulary acquisition. Selections will be chosen so that both second and third year Arabic students can benefit.

20A-20B. Intermediate Arabic. (5:5) Five 1-hour recitation sessions per week. Prerequisites: 1A-1B.

Upper Division Courses

100A. Arabic Grammar and Syntax. (3) Three hours of lecture per week. Prerequisites: 20A-20B. Formerly 100A and a portion of 100B. Discussion of the grammar, syntax, semantics and styles of Arabic, as reflected in literary texts.

100B. Arabic Grammar and Syntax. (3) Three hours of lecture per week. Prerequisites: 100A, or consent of instructor. Formerly a portion of 100B and 100C. Discussion of the grammar, syntax, semantics and styles of Arabic, as reflected in literary texts. Literary texts (see syllabus), organized throughout the semester in an increasing degree of difficulty, are assigned for rapid reading at home and form the basis for a variety of exercises (such as brief summaries in Arabic) aimed at increasing students' active command of the language.

101A-101B. Spoken Arabic. (3:3) May be repeated for additional credit if a different dialect is offered. Three 1-hour meetings per week. Prerequisites: 1A-1B. Formerly 101A-101B. Spoken Arabic.

104. Literary Arabic Usage. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100A. Rapid reading of newspapers and literary texts. Training in the usage of the literary language in writing and speaking and development of skill in Arabic penmanship.

105. Classical Arabic Poetry. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 20A-20B. Reading and literary analysis of classical poetry.

106. Classical Arabic Prose. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 105. Classical Arabic Prose.

107. Arabic Historical Texts. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 20A-20B. Readings of selected texts from various periods.

108. Classical Arabic: Religious and Philosophical Texts. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 106. Classical Arabic Prose.

110. Modern Arabic Literature: Prose Writings. (3) Course may be repeated for credit. Three hours of lecture/recitation per week. Prerequisites: 20A-20B. Fiction, essays, and drama.

111A-111B. Survey of Arabic Literature (in Arabic). (3:3) Course may be repeated for credit. Three 1-hour class meetings per week. Prerequisites: 105. Formerly 101A-101B. Survey of Arabic Literature.

112A-112B, Elementary Akkadian. (4:4) Two 1½-hour meetings per week. Prerequisites: Background in German and French recommended. Introduction to Akkadian grammar and writing. Reading of selected Cuneiform texts. Sequence begins fall. This course will be offered in 1990-91 and in alternate years thereafter.

110A-110B, Intermediate Akkadian. (3:3) Three hours of class per week. Prerequisites: 100A-100B, background in German and French recommended. Reading of selected texts, including law codes, letters, myths, and epics. Sequence begins fall. This course will be offered in 1990-91 and in alternate years thereafter.

120A-120B, Elementary Coptic. (4:4) Three 1½-hour meetings per week. Prerequisites: Background in German and French recommended. Intensive study of Coptic grammar and writing. Reading of selected Coptic texts. Sequence begins fall. This course will be offered in 1989-90 and in alternate years thereafter.

120A-120B. Elementary Coptic. (4:4) Three 1½-hour meetings per week. Prerequisites: 101A-101B, readings in Middle Egyptian hieroglyphic and hieratic texts. Prerequisites: Consent of Instructor. Special topics in Cuneiform. Topics vary and are announced at the beginning of each semester.

Graduate Courses

200A-200B, Advanced Akkadian. (3:3) Course may be repeated for additional credit. One 3-hour meeting 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 Coptic. (3:3) Course may be repeated for credit. Three hours of class per week. Prerequisites: 106A-106B. Reconstruction and critical reading of Coptic texts. Prerequisites: Consent of Instructor. Special topics in Cuneiform. Topics vary and are announced at the beginning of each semester.
Hebrew

Lower Division Courses

1A-1B. Elementary Hebrew. (5,5) Five 1-hour recitations and one hour of laboratory per week.


15A-15B. Hebrew Conversation. (2,2) Two 1-hour meetings per week. Prerequisites: 20A or equivalent. Conversation and discussions on contemporary topics selected from Israeli newspaper articles. Course is conducted on two levels: Intermediate and advanced, simultaneously.

20A-20B. Intermediate Hebrew. (5,5) Five 1-hour meetings per week. Prerequisites: 1A-1B.

Upper Division Courses

100A-100B. Advanced Hebrew. (3,3) Two 1½-hour meetings per week. Prerequisites: 20A 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.

101A-101B. Biblical Hebrew Texts. (3,3) Course may be repeated for credit. Three 1-hour meetings per week. Prerequisites: 20A or equivalent. Texts and procedure of biblical exegesis applied to simple narrative texts.

102A-102B. Postbiblical Hebrew Texts. (3,3) Course may be repeated for credit with consent of instructor. Three 1-hour meetings per week. Prerequisites: 20A or equivalent. Texts from the rabbinic period (Mishnah, Tosefta, Talmud, and Midrash) and an introduction to the languages of rabbinic texts.

103A-103B. Later Rabbinic and Medieval Hebrew Texts. (3,3) Course may be repeated for credit. Three hours of class per week. Prerequisites: 102A-102B. Study of the language and literature of the later period (1200-1500).

104A-104B. Modern Hebrew Texts. (3,3) Course may be repeated for credit with consent of instructor when material varies. Three hours of lecture per week. Prerequisites: 100A-100B or equivalent.

105A-105B. The Structure of Modern Hebrew. (3,3) Course may be repeated for credit. Three hours of lecture per week. An analysis of modern Hebrew grammar, syntax, semantics, morphology, and fixed expressions. Course may be repeated for credit with consent of instructor.

106A-106B. Introduction to Biblical Hebrew. (2) Two hours of lecture per week. An introduction to the history, methods, and scope of biblical paraphernalia in Jewish studies including bibliography, indexes and reference tools for students of Jewish literature. Sample problems in bibliographical research.

107A-107B. Structure of Modern Hebrew and Teaching of Hebrew to Speakers of English. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Two years of Hebrew or the equivalent or consent of instructor. Theoretical and applied analysis of the structure of modern Hebrew, its development and usage and its application to methods and techniques of teaching Hebrew to English speakers.

108. Levels of Modern Hebrew. (3) Course may be repeated for credit as texts vary. Three 1-hour lectures per week. Prerequisites: 20 or equivalent. Syntax, semantics, lexicography and styles of Modern Hebrew, from the literary language to slang, as reflected in representative texts.

111. Intermediate Biblical Texts. (3) Course may be repeated for credit. Three hours of class per week. Prerequisites: 101A-101B or equivalent. A systematic study of the Prophets beginning with Isaiah.

195. Senior Honors. (2-4) Must be taken on a pass/no pass basis. Prerequisites: Limited to senior honors candidates. Directed study centered upon preparation of an honors thesis.

198. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Three hours of class per week. Prerequisites: Consent of instructor. Directed study centered upon a topic, sequence, or period.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Three hours of class per week. Prerequisites: Consent of instructor. Focus on biblical texts seen from a literary point of view, attempting to establish connections with later Hebrew literature.

202A-202B. Advanced Late Antique Hebrew Texts. (3,3) Course may be repeated for credit. Three hours of class per week. Prerequisites: 102A-102B or equivalent. Literary analysis of belletristic Hebrew texts, either prose or poetry, chiefly from the loberian medieval period.

204A-204B. Advanced Modern Hebrew Texts. (3,3) Course may be repeated for credit. Three hours of class per week. Prerequisites: 102A-102B and one of 101A-101B, 102A-102B, or 103A-103B. Selected topics in the development of Hebrew literature from the European Enlightenment to contemporary Israel poetry and fiction.

206. Ancient and Modern Hebrew Literary Texts. (3) Course may be repeated for credit. Three hours of class 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.

208. Seminar. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. Special topics in Hebrew literature are announced at the beginning of each semester.

Persian and Iranian

Persian

Lower Division Courses

1A-1B. Elementary Modern Persian. (5,5) Five 1-hour meetings per week.

15A-15B. Conversational Persian. (2,2) Two 1-hour meetings per week. Prerequisites: Concurrent enrollment in elementary Persian or consent of instructor. Practice of spoken Persian as a supplement to elementary Persian.

Upper Division Courses

100A-100B. Intermediate Modern Persian. (5,5) Five 1-hour meetings per week. Prerequisites: 1A-1B 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.

103A-103B. Classical Persian Poetry. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101A-101B or equivalent. Systematic study of poems belonging to all genres of classical Persian poetry, with consideration of questions of prosody, rhetoric and style.

104A-104B. Contemporary Persian Literature. (3,3) 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 to the present. Concept 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.

105A-105B. Advanced Persian Grammar. (4,4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 104A-104B. Reading and discussion of texts, graded according to difficulty and period.

106A-106B. Reading and Composition for Students with Knowledge of Spoken Persian. (3,3) Three hours of lecture per week. Prerequisites: 104A-104B. Reading and discussion of texts, graded according to difficulty and period.
and writing skills in the language. This course will prepare students to take advanced literature courses in the Persian program.

195. Senior Honors. (2-4) Must be taken on a pass/credit basis. Prerequisites: Limited to senior honors candidates. Directed study centered upon preparation of an honors thesis.

196. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Must be taken on a pass/credit basis. In areas covered by regularly scheduled courses.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a pass/credit basis. In areas not covered by regularly scheduled courses.

200A-200B. Advanced Persian. (3;3) Course may be repeated for credit. Three hours of class per week. Systematic readings in the classics of Persian literature, from the tenth to the eighteenth centuries.

203A-203B. Persian Historical Texts. (3;3) Course may be repeated for credit. Three hours of class per week. Prerequisites: Twelve units of upper division work. Different sections offering a variety of texts from all periods of the literature.

205A-205B. Ugaritic. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Twelve units of Semitic or consent of instructor.

210A-210B. The Canaanite Dialects. (3) Course may be repeated for credit. Three hours of class per week. Prerequisites: Advanced status in Hebrew; 210B is prerequisite to B. The Phoenician, Punic, Moabite, and early Aramaic inscriptions, with reference to palaeography, dialectology, and literary style. Sequence begins Fall.

298. Seminar. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. Special topics in Persian. Topics vary and are announced at the beginning of each semester.

Pre-Islamic Studies

Upper Division Courses

110A-110B. Middle Persian. (3;3) Course may be repeated for credit. One 3-hour meeting per week. Prerequisites: 100A-100B or equivalent; background in German or French recommended, but not required. Maehihean Middle Persian texts, with an introduction to Pahlavi.

111A-111B. Old Iranian. (3;3) Course may be repeated for credit. One 3-hour meeting per week. Prerequisites: Consent of instructor; background in German and French recommended, but not required. Texts from the Vendidad and the Yashts; Achaemenid inscriptions.

Graduate Courses

201A-201B. Iranian Philology. (3;3) Course may be repeated for credit when subject matter varies. Three hours of class per week. Prerequisites: 110A-110B, 111A-111B, or consent of instructor. Reading of texts in Avestan, western Middle Iranian, and Sogdian, taken from Zoroastrian, Manichaean, and Buddhist texts.

Turkish

Lower Division Courses

1A-1B. Elementary Modern Turkish. (5;5) Five 1-hour meetings per week. Sequence begins Fall.

10A-10B. Intensive Beginning Turkish. (10;10) Ten hours of class instruction and five hours of laboratory work per week. Prerequisites: Twelve upper division units in Semitics or consent of instructor; 200A is prerequisite to B. The phonology and morphology of the classical world.

15A-15B. Conversational Turkish. (1-3) Course may be repeated for credit. One to three hours of lecture per week. Must be taken on a passed/credit basis. Prerequisites: 1B or 10A. Practice of spoken Turkish as a supplement to intermediate modern Turkish.

Upper Division Courses

100A-100B. Intermediate Modern Turkish. (5;5) Five 1-hour meetings 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 1-hour meetings per week. Prerequisites: 100A-100B or consent of instructor. Topics from modern Turkish literature.

102A-102B. Ottoman Turkish Texts. (3;3) Course may be repeated for credit. Three 1-hour meetings per week. Prerequisites: 1A-1B or consent of instructor. Study of Turkish literary and historical texts in Arabic script, from the 13th to the 20th century.

H195. Senior Honors. (2-4) Must be taken on a pass/credit basis. Prerequisites: Limited to senior honors candidates. Directed study centered upon preparation of an honors thesis.

H196. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Must be taken on a pass/credit basis. In areas covered by regularly scheduled courses.

H199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a pass/credit basis. In areas not covered by regularly scheduled courses.

Graduate Courses

200A-200B. Advanced Turkish. (3;3) Course may be repeated for credit. Three hours of class per week. Prerequisites: Twelve units of upper division work 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.

Interdepartmental Studies Courses

Graduate Courses

IDS 255A-255B. Eastern Frontiers of the Classical World. (4;4) Course may be repeated for credit. One 3-hour seminar per week. The course is intended to provide an archaeological perspective on the eastern frontiers of the classical world:frontiers which came to extend to Afghanistan and beyond. 255A will deal with prehistoric developments in this easterly area which eventually became a part of the classical world. 255B will explore the interactions of the classical world with the indigenous cultures of Central Asia. Sponsoring departments: Near Eastern Studies and South and Southeast Asian Studies.

Neurobiology (College of Letters and Science)

The biological sciences at Berkeley were reorganized in July 1989. Consult staff in the Department of Molecular and Cell Biology for information about the current undergraduate program in neurobiology.

Graduate Program in Neurobiology

Office: 299 Life Sciences Addition, 643-3325
Chair: Frank S. Werblin, Ph.D.
Head Adviser: Frank S. Werblin, Ph.D.

Professors:
Alan J. Bearden, Ph.D.
David R. Bentley, Ph.D.
Beth Bermudez, Ph.D.
Russell De Valtos, Ph.D.
Ralph D. Freeman, O.D., Ph.D.
Walter J. Freiman, M.D.
Donald A. Glaser, Ph.D.
Cory S. Goodman, Ph.D.
Edward L. Keller, Ph.D.
Harold Lecar, Ph.D.
Edward R. Lewis, Ph.D.
Joseph L. Martinez, Ph.D.
Pietro M. Miale, Ph.D.
M. Geoffrey Owen, Ph.D.
Richard A. Steinhardt, Ph.D.
Gunter H. Stent, Ph.D.
Richard D. Van Sluyters, O.D., Ph.D.
Frank S. Werblin, Ph.D.
Gerard Westheimer, Ph.D.
Robert S. Zucker, Ph.D.

Associate Professors:
S. Marc Brewster, Ph.D.
Karen De Valois, Ph.D.
Joseph L. Martinez, Ph.D.
John P. Miller, Ph.D.
Hisao-Hing H. Moore, Ph.D.

*On leave, spring
*Recipient of Distinguished Teaching Award

On leave, spring
*Recalled to active service
*Recipient of Distinguished Teaching Award
Nuclear Engineering (College of Engineering)

Department Office: 4153 Etcheverry Hall, 642-5010 Chair: T. Kenneth Fowler, Ph.D.

Professors: L. T. Kettner Fowler, Ph.D. University of Wisconsin at Madison. Applied plasma physics and fusion Lawrence M. Graham, Ph.D. University of California. Reactor physics

Kaplan, Ph.D. University of California. Nuclear instrumentation

Lawrence E. Mitchell, Ph.D. University of California at Berkeley. Reactor thermal hydraulic specialists

Thomas H. Rigdon, Sc.D. Massachusetts Institute of Technology. Nuclear materials

Thomas H. Rigdon, Sc.D. Massachusetts Institute of Technology. Nuclear materials

Upper Division Courses

101. Nuclear Reactions and Radiation. (4) Four 1-hour lectures per week. Prerequisites: Physics 7C, Energy and concepts of nuclear reactions and radiations. principles of nuclear fission, fusion, and ionization of the energy sources; reaction fission products, activation analysis. (F) Miller

102. Nuclear Chemistry. (3) Three 1-hour lectures per week. Prerequisites: Upper division course in thermodynamics. Uranium demand and availability; fuel cycles for various reactor types; uranium ores, milling, fuel fabrication; fuel elements; nuclear fission and reprocessing by gas centrifuge; ideal cascades and enrichment costs; fuel reprocessing by solvent extraction; radioactive waste management. (SP Prussin

150. Introduction to Nuclear Reactor Theory. (4) Two 1½-hour lectures and one hour discussion per week. Prerequisites: 101; Mathematics 506. 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. Fission, fuel cycles and fuel management. Production of radionuclides in nuclear reactors. (SP Miller

160. Thermo-Fluid Processes in Nuclear Power. (4) Four hours of lecture per week. Prerequisites: Upper division course in thermodynamics. Fundamentals of heat and momentum transport with application to nuclear power systems. (F) Peterson

161. Nuclear Power Engineering. (4) Four hours lecture per week. Prerequisites: 150; course in fluid mechanics and heat transfer; junior-level course in thermodinamics. Energy conversion in nuclear power systems; design of fission and fusion reactors; structural analysis of reactor core and plant components; thermal-hydraulic analysis of accidents in nuclear power plants; safety evaluation and engineered safety systems. (F) Schrock

162. Radiation Protection and Control. (3) Three hours lecture per week. Prerequisites: 101. Passage of radiation through matter, dosimetry units and measurement, effects of radiation on man, radiation exposure regulations, calculation of radiation exposure and dose, sources of radiation and radioactivity, environmental dispersion, biological pathways, radiation transport in shielding. (F, SP) Kaplan

170. Nuclear Engineering Economics and Design. (3) Three hours lecture per week. Prerequisites: 150 and Junior Level Thermodynamics courses. The course will place strong emphasis on engineering economics. Operating principles of various reactor concepts. Design of thermal power cycles tailored to these reactors. Economics of nuclear plants addressing costs on construction, operation, fuel cycle and decommissioning. (F)

180. Introduction to Controlled Fusion. (3) Three hours lecture per week. Prerequisites: Physics 7C. Introduction to energy produced by controlled thermonuclear reactions. Nuclear fusion reactions, energy balances for fusion systems, survey of plasma physics, neutral beam injection, RF heating methods; vacuum systems; tritium handling. (F) Morse

185. Group Study for Advanced Undergraduates. (1-4) 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: Upper division standing. Group studies of selected topics. (F, SP)

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 advisor. Supervised independent study. Please see pages 91-92 of the General Catalog for description and prerequisites. (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; neutron fission and reprocessing as energy sources. (F) Prussin

220. Irradiation Effects on Structural Metals. (4) Two 2-hour lectures per week. Prerequisites: 120 or
221. Corrosion in Nuclear Power Systems. (3) Two 1½-hour lectures per week. Prerequisites: 120, 220, (Material Engineering recommended) or consent of instructor. Structural materials in nuclear power plants; properties and fabrication of Zircaloy; aqueous corrosion of reactor components; structural integrity of reactor components under combined mechanical, thermal, neutron irradiation, and chemical environment; behavior of reactor materials under accident conditions. (SP) Olander


255. Numerical Methods of Reactor Analysis. (3) Three 1½-hour lectures per week. Prerequisites: 250; Mathematics 120A-120B. The time dependent neutron balance and reactivity effects in nuclear reactor dynamics. Responses of reactor systems to time-varying sources and reactivity changes; reactor parameters from noise experiments; reactivity feedback; stability analysis; space-time reactor dynamics; optimal control. Miller

260. Thermal Aspects of Nuclear Reactors. (4) Four hours of lecture per week. Prerequisites: 160. Fluid dynamics and heat transfer; thermal and hydraulic analysis of nuclear reactors; two-phase flow and boiling; compressible flow; stress analysis; energy conversion methods. (F) Peterson

265. Design Analysis of Nuclear Reactors. (3) Three hours lecture per week. Prerequisites: 150 and 161. Principles and techniques of economic analysis to determine capital and operating costs; fuel management and reactor economics; thermal and hydraulic design of reactor performance, thermal converters, and fast breeders; control and transient problems; reactor safety and licensing; release of radioactive from reactors and fuel processing plants. (SP) Melrose

280. Fusion Reactor Engineering. (3) Three hours lecture per week. Prerequisites: Nuclear Engineering 120. Interrelation between chemical and nuclear science and technology; fission process, chemistry of fission fragment, chemical effects of nuclear transformations; application of radioactivity to study of chemical problem; neutron activation analysis. Also listed as Chemistry 144 and Nuclear Engineering 106.

Professional Courses

301. Teaching Assistant Training. (1-6) May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. May not be used for unit or residence requirements for the doctoral degree. Prerequisites: For candidates for master's degree. Individual study supervised by departmental chair. (F, SP) Miller

Nutritional Sciences (College of Natural Resources)

Nutrition

(Office of Graduate Natural Resources, Interdepartmental Graduate Group)

Office: 146 Morgan Hall, 642-2879
Chair: Janet C. King, Ph.D.

Professors:

Bruce N. Ames, Ph.D. (Molecular and Cell Biology)
Leonard F. Biliaderis, Ph.D. (Mechanical Engineering 105)
John G. Forte, Ph.D. (Molecular and Cell Biology)
Sharon E. Fleming, Ph.D. (Nutritional Sciences)
Alexander V. Grot, Ph.D. (Molecular and Cell Biology)
Barry Shane, Ph.D. (Nutritional Sciences)

*Not offered 1991-92
*On leave, spring
*Recalled to active service
*Recipient of Distinguished Teaching Award

*On leave, spring
*On leave, fall

Nutritional Sciences / 307
Education Goals and Major Requirements

The Department of Nutritional Sciences offers two undergraduate majors leading to the B.S. degree: nutrition and food science, and clinical dietetics. The major in nutrition and food science combines a strong foundation in natural sciences with advanced course work in nutrition, biochemical and physiological study of nutrient utilization, and food and personal diets for proper nutrition and well-being. The major in clinical dietetics focuses on the study of populations and planning of food materials. Graduates often find employment in research laboratories, or the food industry. Others pursue graduate studies in the biological or chemical sciences or enter professional programs in the health sciences. Courses that fulfill the lower division prerequisites for junior standing include: Chemistry 1A-1B, 8A-8B; English 1A-1B or equivalent; Mathematics 16A; Statistics 2 or 20; Molecular and Cell Biology 32, 32L; Plant Pathology 123; and Nutritional Sciences 10.

Nutrition and food science students may also meet the academic requirements of the American Dietetic Association with careful selection of course work. The department sponsors an approved Plan IV program. Graduates who have met those program requirements are eligible to apply to an A.D.A.-accredited/approved supervised practice program (dietetic internship or Ag 4-4) for the second phase of their education. The major in nutrition and clinical dietetics is reserved for undergraduates who are admitted to the Coordinated Program in Dietetics offered by the department. This is a two-year professional program of academic and clinical study that is accredited by the A.D.A. and meets all requirements for becoming a registered dietitian. The academic program in both dietetics routes includes fundamental preparation in the natural and social sciences with advanced courses in nutrition, food science, and management. At the conclusion of all training (academic and practice related) individuals are eligible to take the nationally administered registration examination. Graduates find employment as registered dietitians in health care, government, industry, community agencies, educational institutions, and research laboratories. Many graduates pursue further professional or graduate study in nutrition, health science, or related fields.

The graduate courses offered by the department are designed and planned jointly for the M.S. and Ph.D. in nutrition. The courses include advanced study of research techniques, nutrient functions, food and nutrition policy issues, and the latest developments in nutritional sciences. Graduates find employment in government, industry, academic institutions, medical research, clinical nutrition, and research and extension agencies. Many seek advanced professional and medical degrees.

Major requirements appear in the Announcement of the College of Natural Resources.

For further information please contact the student affairs officer, 146 Morgan Hall, 642-2879.

Lower Division Courses

10. Introduction to Human Nutrition, (3) Students who have taken 100 will not receive credit for 10. Two hours of lecture and one hour of discussion per week. Prerequisites: 10 and 101. Principles of digestion and metabolism of nutrients. Discussion of foods as a source of nutrients and of the evidence for the effects of nutrition on health. Emphasis on issues of current interest and on worldwide problems of nutrition. Students are required to record their own diet, calculate its composition and evaluate it. (F,SP) Ketchmer, Amy, Chang

Upper Division Courses

100. Human Nutrition and Metabolism, (5) Three 1-hour lectures followed by 1½ hours discussion demonstration per week. Prerequisites: Molecular and Cell Biology 32 and 102 may be taken concurrently. Human nutrient requirements throughout the life cycle, nutritional balances and metabolic status, nutrient function and metabolism. (F,SP) Oakes, King

104. Human Food Practices, (2) Two hours of lecture and one hour of discussion per week. Prerequisites: 10; 101; 102 or consent of instructor. Evaluation of the chemical, physical, functional, and nutritional properties of foods and the changes which occur during processing and storage. Evaluation of the quality criteria of foods and the criteria for standards and legal requirements. (F) Bjeldanes, Chang

105L. Introductory Food Science Laboratory, (2) One hour of lecture/discussion and three hours of laboratory per week. Prerequisites: 106; Molecular Cell Biology 102 or consent of instructor. Evaluation of the chemical, physical, functional, and nutritional properties of foods and the changes which occur during processing and storage. Evaluation of the quality criteria of foods and the criteria for standards and legal requirements. (SP) Bjeldanes, Chang

106. Food Chemistry Laboratory, (4) One hour of lecture, one hour of discussion, and two 3-hour labs per week. Prerequisites: 106 and Molecular Cell Biology 102L, and a course in Statistics. Principles, methods, and techniques for quantitative analysis of food components by physical, chemical and biological assays. Effects of processing on the nutritional and functional properties of foods. Emphasis on the principles of food preparation. Evaluation of the sensory and quality aspects of food. (F) Fleming

108. Food Chemistry Laboratory, (4) One hour of lecture, one hour of discussion, and two 3-hour labs per week. Prerequisites: 106 and Molecular Cell Biology 102L, and a course in Statistics. Principles, methods, and techniques for quantitative analysis of food components by physical, chemical and biological assays. Effects of processing on the nutritional and functional properties of foods. Emphasis on the principles of food preparation. Evaluation of the sensory and quality aspects of food. (SP) Bjeldanes

113. Food Microbiology and Technology, (3) Three hours lecture per week. Prerequisites: Recommended: A course in microbiology or bacteriology, a course in food science or food chemistry. Characteristics and actions of microorganisms involved in food spoilage and food fermentations. Selected aspects of food technology and processing. Statistical quality control. (SP) Chang

113L. Food Microbiology Laboratory, (2) Four hours of laboratory and 1 hour of lecture/demonstration per week. Prerequisites: 113 (may be taken concurrently). Laboratory exercises with the microorganisms involved in food fermentations and food spoilage. The action of enzymes and microorganisms on foods. Thermal processing. Foodborne bacteria and the intestinal mircroflora. (SP) Chang

135. Food Systems Organization and Management, (3) Two hours of lecture/discussion and three hours of clinical laboratory or field experience per week. Prerequisites: 100. Principles of organization and management applied to institutional food service systems; production scheduling, equipment selection, purchasing, and cost accounting, quality control, personnel management, administrative systems; laboratory experiences, projects, and field work in institutional situations. (SP) Staff

150. Experimental Nutrition, (4) Three hours of lecture and 1 hour of discussion per week. Prerequisites: 100. Experimental basis for basis for the treatment of human conditions and diseases by dietary means. (SP) Williams

161. Therapeutic Nutrition, (4) Four hours of lecture and one hour of discussion per week. Prerequisites: General knowledge of biochemistry, physiologically, chemical, and nutritional bases for the treatment of human conditions and diseases by dietary means. (SP) Tumlund

161L. Therapeutic Nutrition Laboratory, (4) Four hours of laboratory with demonstration and discussion per week. Prerequisites: 161 may be taken concurrently. Dietary therapies of therapeutic treatment and evaluation of various human conditions and diseases. (SP) Burkman

165. Research Dietetics, (1) One 1-hour lecture/discussion per week. Prerequisites: 100. Types and design of research diets. Quality control. Tools of the research dietitian including computer programs, food composition tables and computer bases. Roles of the team members who conduct human nutrition research. Ethics of human nutrition research. (F) Murphy

170. Experimental Nutrition Laboratory, (4) One hour of lecture, one hour of discussion and two 3-hour laboratory periods per week. Prerequisites: 100 and Molecular Cell Biology 102L, and a course in Statistics. Basic principles and techniques used in human and animal nutrition research. Students design, execute, and analyze experiments. (F,SP) Aponte, Wolf, deLumen

180. Introduction to Clinical Dietetics, (1) One 1-hour seminar per week; thirty hours of fieldwork plus discussion per semester. Must be taken on a pass/fail basis. Prerequisites: 2.5 GPA in required major courses and consent of instructor. Mini-course, 24 hours of clinical fieldwork per semester; includes planned and directed, discussion and evaluation. Intended primarily for students in clinical dietetics. Introduction to practice of dietetics in hospital and specialized settings. In addition, attendance at weekly clinical dietetics seminars is required. Burkman

181. Clinical Nutrition I, (4) Two hours of lecture and eight hours of clinical laboratory, field experience and discussion per week. Prerequisites: 181, 161, and maintenance of 2.5 GPA in required major courses and consent of instructor. Intended primarily for students in Clinical Dietetics. Methods of nutrition care, laboratory and computerized data bases. Role of patients in treatment. Dietetic council teaching methods; assessment of nutritional status; medical terminology. Nutrition care planning and evaluation through life cycle and for patients requiring modified diets. Assessment of therapeutic diets and formulated foods; emphasis on trauma, renal, hepatic and gastrointestinal disorders. (F) Hellestein, Maier, Sanders

182. Clinical Nutrition II, (4) One 2-hour lecture/discussion and one 8-hour clinical experience per week. Prerequisites: 181, 161, and maintenance of 2.5 GPA in required major courses and consent of instructor. Intended primarily for students in Clinical Dietetics. Methods of nutrition care, laboratory and computerized data bases. Role of patients in treatment. Dietetic council teaching methods; assessment of nutritional status; medical terminology. Nutrition care planning and evaluation through life cycle and for patients requiring modified diets. Assessment of therapeutic diets and formulated foods; emphasis on trauma, renal, hepatic and gastrointestinal disorders. (F) Hellestein, Maier, Sanders

182L. Clinical Nutrition Laboratory, (1) One 3-hour laboratory per week. Prerequisites: NS 182 (may be taken concurrently). 181, 161, maintenance of 2.5 GPA in required major courses and consent of instructor. Principles and laboratory techniques used in the clinical evaluation of human nutrition; discussion of meaning of such values in patient treatment. (F) Hellestein

190. Introduction to Research in Nutritional Sciences, (1) May be repeated for credit. One hour of lecture and one hour of research per week. Prerequisite: 100. Open only to students who have completed the current research literature in food science and nutrition. (F,SP) Staff
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 passed/not passed basis. Supervised experience in off-campus organizations relevant to specific aspects of foods and nutritional sciences. Regular individual meetings with faculty sponsor and written reports required. (F,SP) 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. (F,SP) Staff

199. Supervised Independent 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. Enrollment is restricted by regulations listed on pages 91-92 of the General Catalog. (F,SP) Staff

Graduate Courses

200. Advanced Human Nutrition. (4) Three 11-hour review lectures and one 2-hour advanced lecture per week. Prerequisites: 11, Molecular and Cell Biology 32 and 50, or consent of the instructor. Prerequisites: Consent of instructor. Study of mechanisms by which nutrients modulate metabolic and developmental processes at the molecular and cellular level with emphasis on experimental systems for studying nutrient control of gene expression. Shane, Aponte

201A. Molecular and Cellular Nutrition. (2) Two hours of lecture/discussion per week. Prerequisites: Molecular and Cellular Biology 100 or 101 or consent of the instructor. Prerequisites: Consent of instructor. Analysis of current research and the basis for current nutritional therapies in common human diseases. Evaluation of research pertaining to the nutrition therapies currently employed in clinical practice. Use of recent research papers will be emphasized. Hellingstein

201B. Metabolism and Human Nutrition. (2) Two hours of lecture/discussion per week. Prerequisites: 200 or consent of instructor. Prerequisites: Consent of instructor. Critical review of the knowledge and methodologies for investigating the consequences of nutritional status of individuals and populations. Policy implications and research needs will be discussed. Viteri

202. Carbohydrate and Lipid Metabolism. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: 100. Nutritional and hormonal regulation of carbohydrate and lipid metabolism, including regulatory abnormalities. Extensive reading and analysis of current scientific literature will be required to supplement the lectures. Williams

203. Vitamin and Mineral Metabolism. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: 150. Advanced vitamin and mineral nutrition; emphasis on function, homeostatic control, and dietary need. Amy

204. Protein and Energy Metabolism. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: 150 (or a course in dietary needs and metabolism) and a course in statistics. Factors influencing protein and energy utilization and metabolism. Carpenter

211. Research Methods in Nutritional Sciences. (2) One hour of lecture and two hours discussion/demonstration per week. Prerequisites: 200, Molecular and Cell Biology 32 and 33, or consent of instructor. Preparation of instructional units. (SP) Hudes

212. Statistics in Nutrition Research. (1) One hour lecture per week. Prerequisites: A course in statistics. Understanding of statistical procedures and the importance of experimental design and data encountered in nutrition research. Assumptions and appropriateness of chi-square tests, T-tests, ANOVA, correlation and regression, multiple comparison procedures and non-parametric procedures. (SP) Hudes

213. Special Topics in Food Microbiology. (2) One 2-hour lecture/seminar per week. Prerequisites: Consent of instructor. Critical review and discussion of recent literature in food microbiology. Topics may vary from year to year. May include: pathogenic microorganisms in foodborne illness, physiology of the intestinal microflora, or genetic engineering. Chang

260. Topics in Human Nutrition. (2) Two hours of lecture per week. Prerequisites: 200. Analysis of current research and of areas of interest and controversy in human nutrition. King

261. Topics in Clinical Nutrition. (2) Two hours of lecture per week. Prerequisites: 200 and 161 or consent of instructor. Analysis of current research and the basis for current nutritional therapies in common human diseases. Critical evaluation of research pertaining to the nutrition therapies currently employed in clinical practice. Use of recent research papers will be emphasized. Hellingstein

262. Nutrition and Human Reproduction. (1) One 2-hour lecture per week for 7 1/2 weeks. (Half-course) Prerequisites: Consent of instructor. Study of fertility, pregnancy and lactation; malnutrition and reproduction performance. Assessment of nutritional status in pregnant and lactating women. King

290. Advanced Seminars in Nutritional Sciences. (1-2) May be repeated for credit. One hour of lecture/discussion per week per unit. Prerequisites: Graduate standing. Advanced study in topics of nutritional sciences. More than one section may be taken simultaneously. (F,SP) Staff

292. Graduate Research Colloquium. (1) May be repeated for credit. One hour of seminar/colloquium per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Prerequisites: Consent of instructor. Seminars and discussions on graduate students' research proposals and results of their research. Participation in discussion and evaluation of others' presentations is required. (F,SP) Staff

298. Directed Group Studies. (1-4) 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 will vary depending on interests of qualified graduate students and availability of staff. (F,SP) Staff

299. Research in Food and Nutrition. (1-12) May be repeated for credit. Approxi mately four hours of research per week per unit. Prerequisites: Graduate standing and consent of instructor. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) May not be repeated for credit for the doctoral degree. May be repeated for credit. Approximately four hours of study per week per unit. Prerequisites: 200. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Prerequisites: Consent of instructor. Individual study in consultation with the major field adviser intended to provide an opportunity for qualified students to prepare themselves for the various examinations required for candidates for the Ph.D. (F,SP) Staff

Professional Courses

301. Professional Preparation: Teaching in Nutritional Sciences. (1) One hour of lecture/discussion per week. Prerequisites: Consent of instructor. Teaching methods in nutrition and food science at the university level; course content, planning, and evaluation; preparation of instructional units. (F,SP) Bjeldanes

302. Professional Preparation: Supervised Teaching Experience in Nutrition. (1-4) May be repeated for credit. Three hours of supervised teaching experience per week per unit. Prerequisites: 301 (may be taken concurrently) and a 2.5 GPA in required major courses and consent of instructor. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Practica l supervised experience in teaching nutrition and food science at the university level; planning, presentation, and evaluation of instructional units. (F,SP) Bjeldanes

401. Nutritional Counseling. (2) Must be taken on a passed/not passed basis. Prerequisites: 182 (may be taken concurrently) and a 2.5 GPA in required major courses and consent of instructor. Minimun of 80 hours of clinical fieldwork during the semester; includes planning, dietetics in an outpatient setting; presentation, and evaluation sessions as needed. Additional effort may be required to achieve desired competency. Supervised practice of dietetics in an outpatient setting with progressively greater responsibility to entry level practitioners. Course may be taken concurrently. (F,SP) Maler

402. Hospital Dietetics. (6) Minimum of 200 hours of field work; 1 hour of discussion per week. Must be taken on a passed/not passed basis. Prerequisites: 182 and a 2.5 GPA in required major courses and consent of instructor. Minimum of 200 hours of clinical fieldwork during the semester; includes planning, discussion, and evaluation sessions as needed. Additional effort may be required to achieve competency. Supervised practice of dietetics in a hospital setting with progressively greater responsibility to entry level practitioners. Course may be taken concurrently. (F,SP) Sanders

408. Field Study in Clinical Specialties. (2) May be repeated for credit. Minimum of 80 hours of clinical fieldwork; one hour of discussion per week. Must be taken on a passed/not passed basis. Prerequisites: 182; 2.5 GPA in required major courses and consent of instructor. Minimum of 80 hours of clinical fieldwork during the semester; includes planning, discussion, and evaluation sessions as needed. Additional effort may be required to achieve competency. Supervised practice of dietetics in subspecialties (e.g. burn unit, dialysis unit). (SP) Booth

409. Clinical Dietetics Seminar. (1) May be repeated for credit up to four units. Two hours of lecture, discussion and supervised practice of dietetics per week. Prerequisites: A 2.5 GPA in required major courses and consent of instructor. Seminars and discussions on professional roles and responsibilities of dietitians; clinical presentation and analysis of case studies; special topics of clinical dietetics. (F,SP) Booth, Burkman

492A. Advanced Field Study in Food Service Management. (1-3) May be repeated for credit. Minimum of 40 hours of clinical fieldwork per week; 1 hour discussion per week. May be taken on a passed/not passed basis. Prerequisites: 2.5 GPA in required major courses; consent of instructor. Minimum of 40 hours of clinical fieldwork per unit; includes planning, discussion, and evaluation sessions as needed. Additional effort may be required to achieve competency. Supervised practice of dietetics in food service management settings. Students will gain practical experiences in the operation and needed. A part of food service systems: purchasing, inventory, trayline operations, food preparation, personnel supervision, budget, safety and sanitation. (F,SP) Booth

492B. Advanced Field Study in Nutrition Education. (1-3) May be repeated for credit. Minimum of 40 hours of clinical fieldwork per week; 1 hour discussion per week. May be taken on a passed/not passed basis. Prerequisites: 2.5 GPA in required major courses; consent of instructor. Minimum of 40 hours of clinical fieldwork per unit; includes planning, discussion, and evaluation sessions as needed. Additional effort may be required to achieve competency. Supervised practice of dietetics in nutrition education settings. Students will gain practical experiences in the operation and needed. A part of food service systems: purchasing, inventory, trayline operations, food preparation, personnel supervision, budget, safety and sanitation. (F,SP) Booth
492C. Advanced Field Study in Research Dietetics. (1-3) May be repeated for credit. Minimum of 40 hours of clinical fieldwork per unit; 1 hour discussion per week. Must be taken on a passed/not passed basis. Prerequisites: 2.5 GPA in required major courses; consent of instructor. Minimum of 40 hours of clinical fieldwork per unit: includes planning, discussion, and evaluation sessions as needed. Additional effort may be required to achieve competency. Supervised practice of dietetics in a community dietetics settings. The student will gain knowledge and practical skills in the business of nutrition consulting. Will participate in processes involved in starting a business and daily activities associated with maintaining that business (marketing, accounting, etc.). (F,SP) Booth

492D. Advanced Field Study in Private Practice. (1-3) May be repeated for credit. Minimum of 40 hours of clinical fieldwork per unit; 1 hour discussion per week. Must be taken on a passed/not passed basis. Prerequisites: 2.5 GPA in required major courses; consent of instructor. Minimum of 40 hours of clinical fieldwork per unit: includes planning, discussion, and evaluation sessions as needed. Additional effort may be required to achieve competency. Supervised practice of dietetics in a community dietetics settings. The student will gain knowledge and practical skills in the business of nutrition consulting. Will participate in processes involved in starting a business and daily activities associated with maintaining that business (marketing, accounting, etc.). (F,SP) Booth

492E. Advanced Field Study in Community Dietetics. (1-3) May be repeated for credit. Minimum of 40 hours of clinical fieldwork per unit; 1 hour discussion per week. Must be taken on a passed/not passed basis. Prerequisites: 2.5 GPA in required major courses; consent of instructor. Minimum of 40 hours of clinical fieldwork per unit: includes planning, discussion, and evaluation sessions as needed. Additional effort may be required to achieve competency. Supervised practice of dietetics in a community dietetics settings. The student will gain practical experience in the duties of a dietitian in community programs and agencies. As appropriate the student will be involved in delivery of nutrition services, administrative duties, program planning and evaluation, etc. (F,SP) Booth

497. Field Study in Clinical Dietetics. (1-5) May be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: 161 and a 2.5 GPA in required major courses; consent of instructor. Minimum of 40 hours of clinical fieldwork per unit: includes planning, discussion, and evaluation sessions as needed. Additional effort may be required to achieve desired competency. Supervised practice of dietetics in specialized clinical settings. (F,SP) Booth and among households. The various nutritional problems plaguing developing nations (including famine); intervention measures, such as food aid, feeding programs, price policies and nutrition education, and methods of program evaluation are reviewed. (SP)

IDS 295. Systems and Integrative Biology. (1) Course may be repeated for credit. One 2-hour seminar/lecture every other week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Biophysics, Bioengineering, Nutritional Sciences or Physiology. Presentation and discussion of current research in integrative, developmental, and regulatory biology. Emphasis on interdisciplinary communication and approaches. Sponsoring departments: Nutritional Sciences and Molecular and Cell Biology. (SP)

Optometry

Office of the Dean (542-3414) and Admissions (542-9537), 351 Minor Hall
Dean: Jay M. Enoch, O.D., Ph.D.

Professors:
Anthony J. Adams, O.D., Ph.D. Color vision; assessment of visual field
Ralph L. Dewey, O.D. Ph.D. Visual neurophysiology; color vision; spatial vision
Jay M. Enoch, O.D., Ph.D. Retinal receptor optics and functions; visual response to layer-by-layer stimulation; visual appearance of the retina and the elderly
Ralph D. Freeman, O.D., Ph.D. Neurophysiology and psychophysics of visual development and plasticity
Stanley A. Klein, O.D. Ph.D. Spatial vision; psychophysical methods and vision test design; nonlinear analysis of visual processes
Robert B. Mandell, O.D., Ph.D. Structure, growth, and function of the cornea; contact lenses
Sheldon D. Miller, Ph.D. Membranes: transport and biochemistry
Kenneth W. Morgan, O.D., Ph.D. Corneal physiology; contact lenses; corneal effects of topical medications
Clifton M. Schor, O.D., Ph.D. Binocular vision: human development, ocular motility, strabismus, and amblyopia
Lawrence Stark, M.D. Control of eye movements, accommodation and the pupil; Bioengineering of movement and computer vision
Richard C. Van Suyters, O.D., Ph.D. Visual development; neurophysiology; visuomotor interaction
Irvine Fatt (Emeritus), Ph.D. Material and energy transport in the eye; contact lens technology related to physiology of the eye
Evelyn W. Morgan (Emeritus), O.D., Ph.D. Visual neurophysiology: development and plasticity, visual-evoked potentials
Meredith W. Morgan (Emeritus), O.D., Ph.D. Ocular optics and biochemistry

Associate Professors:
Karen DeValois, Ph.D. Psychophysics and electrophysiology of color vision and spatial vision
Guillaum Haegerstrom-Portnoy, O.D., Ph.D. Clinical psychophysics and basic aspects of human color vision; binocular vision
Assistant Professors:
Joseph A. Bonanno, O.D., Ph.D. Corneal physiology and contact lenses
Jack R. Holston, B.S. (Emeritus)
Senior Lecturers:
Darrel B. Carter, O.D., Ph.D. Ocular pathology; clinical lens optics
Michael G. Harris, O.D., J.D., M.S. Contact lenses and corneal science

Lecturer:
John D. Grisham, O.D., M.S.
Thomas M. Wiley, O.D., M.S., M.A.

Affiliated Professors:
Richard J. Brand, Ph.D. (Biomedical and Environmental Health Sciences) Biostatistical methods for risk research
Sumit P. Davis, Ph.D. (Physics) Astrophysical spectroscopy
Marion C. Diamond, Ph.D. (Integrated Biology) Neuroanatomy, environment, asymmetry, hormones
Stephen P. Dilberto, Ph.D. (Mathematics) Casteal mechanics, applied mathematics
Richard E. Mathies, Ph.D. (Chemistry) Biophysical and physical chemistry
Matthew K. Chan, O.D., Ph.D. Vision science
Richard T. Wacker, O.D.

Director of Clinics: Weylin G. Eng, O.D., 230 Minor Hall, 542-0945

Clinical Professors:
Alan Burkhalter, M.D.
Robert W. Lester, O.D.
Richard H. McDonald, M.D.
Edwin B. Mehr, O.D.
Howard Schatz, M.D.
Anthony Trevor, M.D.

Associate Clinical Professors:
Clay M. Averett, O.D., Ph.D.
Robert S. Carty, O.D.
Bernard J. Donlan, O.D., M.S.
Weylin G. Eng, O.D.
Bernard H. Faibish, O.D.
Joseph M. Faber, M.D.
Jan V. Gong, O.D.
Craig K. Hisaka, O.D., M.P.H.
Thomas H. Jamison, M.D.
Richard D. Jones, O.D.
Karen E. Kerr, O.D., Ph.D.
Curtis W. Keswick, O.D.
Peter K. Lever, O.D.
Edward J. Reveille, O.D.
Donald S. Sawyer, O.D.
Albert L. Scalf, O.D., M.S.
James E. Sheedy, O.D., Ph.D.
Lawrence S. Thai, O.D., M.D.
Eugene Y. Tsujimoto, O.D.
Karen L. Wardwell, O.D.
Thomas M. Wiley, O.D., M.S.
Harry G. Wilkins, O.D.
Frank Zisman, O.D., Ph.D.

Assistant Clinical Professors:
Everett A. M.D.
Stephanie N. Baca, O.D.
Daniel A. Biegeleisen, O.D.
Charles R. Bailey, O.D.
Richard W. Baker, O.D.
Roy C. Bay, O.D., M.S.
Roy Black, O.D.
Christine Biascher, O.D.
Dennis Burger, O.D.
Thomas M. Callan, O.D.
Mark A. Fung, O.D.
Mark A. Fujikawa, O.D.
Paul J. Fujikawa, O.D.
Michael A. Glazek, O.D.
Michael Gold, O.D.
Gregory L. Goodrich, O.D.
Howard J. Haas, M.D.
Patry L. Harvey, O.D., M.P.H.
Stephen J. Ingman, O.D.
Douglas Kay, O.D.
Rodolick J. Keeser, O.D.
Mark A. Line, O.D., M.S.
Jeffrey K.O., O.D.
Klaire Lardas, M.D.
George K. Lee, O.D.
Stephen L. Lester, O.D.
Brian Levy, M.D., M.S.
Gary L. Liberman, O.D., Ph.D.
Walter W. Lindsey, O.D.
Richard F. London, O.D., M.A.
Kenneth G. Low, M.D.
Joseph H. Malino, O.D.
Deborah McBride, O.D.
Bruce L. Melone, O.D.
Robert W. Melrose, O.D.
Rosaamente M. Mesro, O.D.
Alan T. Nakashita, O.D.
Gary A. O'neal, O.D.
Steven D. Parsons, O.D.
Paul R. Rico, O.D.
Michael E. Ross, O.D.
Steven Schwartz, O.D.
Kenneth R. Seger, O.D., M.Sc.
Michael R. Seyerling, M.D.
Joseph R. Sherr, O.D.
David C. Simpson, O.D.
Karen R. Spindler, O.D.
Joseph S. Tardifan, M.D., Ph.D.
Charlotte Tischach, O.D., M.A.
H. V. Vawser, O.D.
Peter S. Vitsand, O.D.
Richard T. Warer, O.D.
Gloria E. Wats, O.D.
Diana H. Williams, O.D.
Russell Worrall, O.D.
Burton Worrell, O.D.

Teresa Yim, O.D., M.A.

Clinical Instructors:
Stephan J. Denton, O.D.
James Hafnor, O.D.
Jane Hafnor, O.D.
Timothy Harold, O.D.
George Hurd, O.D.
Shay S. Jin, O.D.
Lance B. Johnson, O.D.
Bills Z. Knight, O.D.
Lori A. Landgren, O.D.
Mark G. Mitchell, O.D.
Raymond F. Pedersen, O.D., M.S.
Paul H. Peng, O.D.

IDS 191A. Introduction to Laboratory Animal Science and Resources. (2) One 1 1/4-hour lecture and one 2 1/4-hour laboratory per week. Must be taken on a passed/not passed basis. Prerequisites: Biology 1A-1B or equivalent, upper division standing. For students working with laboratory animals. Lectures basic animal science, including animal research models; principles of analgesia, surgery, and sanitation; animal welfare regulations and practices of humane care and breeding; diseases. Laboratory applications of lecture material. Sponsoring departments: Entomology and Nutritional Sciences.

Graduate Course

IDS 290. International Food and Nutrition Policies. (3) Sponsoring departments: Nutritional Sciences; Agricultural and Resource Economics, Social and Administrative Health Sciences. Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. A survey course surrounding the world food situation emphasizing the links between food production, food consumption and nutrition: the effect of income and prices on food demand, and socio-economic factors affecting food consumption within
mechanisms regulating physiological functions. Abnormalities of these mechanisms, changes in morphology, physiology and biochemistry related to disease, Biochemical, physiological and visual requirements of the immune response. (F) Bonanno, Miller

132. Pharmacology. (4) Four 1-hour lectures per week. Prerequisites: Vision Science 105. Formerly 140. Basic principles of drug action. Pharmacodynamics, mechanisms of action, toxicology. Actions, uses, contraindications and side effects of ophthalmic preparations used in the detection, diagnosis and management of eye disease. Adverse and beneficial ocular and systemic effects of ophthalmic and systemic drugs. (F) Paze

134. Systemic Disease. (3) Three 1-hour lectures per week. Prerequisites: 130. Formerly 130. Basic processes underlying human disease. Epidemiology, signs, symptoms, and treatment of systemic diseases. Basic techniques of physical examination and interpretation of common symptoms and signs relating to systemic disease processes. (F) Jamison

135. Ocular Manifestations of Systemic Disease. (3) Three 1-hour lectures per week. Prerequisites: 134. Formerly 131. Basic processes underlying the ocular manifestations of systemic disease. Relationship between systemic disease processes and ophthalmic signs. (SP) Mitchell

137A-137B. Fundamentals of Ocular Disease Diagnosis. (2,2) One 1-hour lecture and one 2-hour laboratory per week. Prerequisites: 130 and Vision Science 107. Formerly 135A-135B. Instrumentation, medical and surgical treatments for the detection and diagnosis of ocular disease. Includes examination of the ocular fundus, the anterior segment of the eye and the visual fields. (F,SP) DiMartino

138A-138B. Basis, Recognition, and Management of Ocular Disease. (2) Two 1-hour lectures and one 2-hour laboratory per week. Prerequisites: 135. Formerly 136A-136B. Etiology, histopathology, microbiology, symptomatology, recognition, differential diagnosis, and management of ocular disease. (F,SP) Bailey

140. Anomalies of Binocular Vision. (3) Two 1-hour lectures and one 2-hour laboratory per week. Prerequisites: Vision Science 118. Formerly 133. Heterophoria, strabismus, and amblyopia. Detection, measurement, classification, etiology, symptomology, diagnosis, and prognosis of disorders of binocular fixation, both constant and non-constant. Orthoptics and vision training. (SP) Haegerstrom-Portnoy

141. Treatment of Binocular Anomalies. (3) Two 1-hour lectures and one 2-hour laboratory per week. Prerequisites: 140. Formerly 134. Analysis of problems associated with the binocular system and the prognosis for their treatment. Rationale and methods for treatment with lenses, prisms, occlusion, orthoptics, pleoptics, drugs, and surgery. Design and implementation of treatment programs. (F) Grisham

142. Pediatric Optometry. (2) One 1-hour lecture per week. Prerequisites: 120C. Formerly 156B. Optometric examination, management and treatment of pediatric patients. Psychology of infants and children. Methods of assessing visual and intellectual development. (F) Grisham

150. Geriatric Optometry. (2) Two 1-hour lectures per week. Prerequisites: 120C. Formerly 436. Physical, psychological, and visual needs of the aging patient. Special problems, approaches and techniques used in the examination, treatment, and management of aging patients. (F) Haegerstrom-Portnoy

151. Low Vision. (3) Two 1-hour lectures and one 2-hour laboratory per week. Prerequisites: 150. Formerly 156A. Epidemiology and etiology of low vision. Opticococular principles of low vision aids. Optometric examination and treatment of the low vision patient. Interdisciplinary rehabilitation resources, counseling, and referral. (SP) Bailey

160A. Contact Lenses: Examination of the Contact Lens Patient. (3) Two 1-hour lectures and one 2-hour laboratory per week. Prerequisites: 120C. Formerly 161A. The physiological basis for fitting contact lenses. Effects of a contact lens on the tears, lids, and cornea. Examination procedures and instrumentation used in monitoring the ocular response to contact lenses. Contact lens fitting, care and handling. (SP) Mandell

160B. Contact Lenses: Principles and Practice. (3) Two 1-hour lectures, one 2-hour laboratory per week. Prerequisites: 160A. Formerly 161B. Continuation of 160A. Physical and optical properties of contact lenses. Fitting contact lenses to the human eye, clinical implications. (F) Harris

160C. Contact Lenses: Advanced Techniques. (2) One 1-hour lecture and one 2-hour clinic preceptorship per week. Prerequisites: 160B. Formerly 161C and 161D. Continuation of 160B. Advanced techniques in fitting contact lenses and recent developments in the field of contact lenses. (SP) Paze

170A-170B. Practice of Optometry. (3,2) One 2-hour lectures and one 1-hour laboratory per week. Prerequisites: 120C. Formerly 185A-185B. Laws governing the practice of optometry. Establishment, operation, and economics of an optometric practice. Professional organizations and societies, interpersonal relationships. Methods for the delivery of optometric services. Epidemiological trends and health care implications. (SP) Thal, Hisaka

190A-190B. Optometry Research Project. (1,1) One 1-hour lecture and one 2-hour laboratory per week. Prerequisites: O.D. Degree. Credit and grade to be awarded upon completion of the sequence. Must be taken on a passed/not passed basis. Prerequisites: 120C. Elements of a research proposal. Fundamentals of scientific inquiry. Experimental design and analysis of data. (F,SP) Bonanno, Cohn

191A-191B. Optometry Research Project. (1,2) One 1-hour discussion per week. Must be taken on a passed/not passed basis. Credit and grade to be awarded on completion of the sequence. Prerequisites: 190A and 190B. Thesis research for optometry students. Presentation of research results. (F,SP) Staff

198. Group Studies. (2) Two 1-hour lectures per week. Must be taken on a passed/not passed basis. Prerequisites: 430A. Advanced topics in specialty areas. (F)

Graduate Courses

230A-230B. Graduate General Clinical Practice. (2-6) Course may be repeated for credit. Four hours of clinic per credit hour. Prerequisites: O.D. Degree. General Optometric practice for four hours per week on a pass/fail basis. Must be taken on a satisfactory/unsatisfactory basis. More than one clinical specialty may be taken simultaneously. (F,SP) Staff

231A-231B. Graduate Specialty Clinics. (2-6) Course may be repeated for credit. Four hours of clinic per credit hour. Prerequisites: O.D. Degree. Clinical examination of patients in designated specialty clinics. Must be taken on a satisfactory/unsatisfactory basis. (F,SP) Staff

281A-281B. Graduate Clinical Rounds. (1-3) Course may be repeated for credit. Seminar/patient consultation. Must be taken on a satisfactory/unsatisfactory basis. (F,SP) Staff

292A-292B. 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)

299A-299B. Independent or Group Studies. (1-6) Course may be repeated for credit. Directed studies.

*Not offered 1991-92
^On leave, spring
*Recalled to active service
+Recipient of Distinguished Teaching Award
Physiological Optics (Vision Science)

Upper Division Courses

101. Geometrical Optics. (4) Three 1-hour lectures, one 2-hour laboratory and one 1-hour discussion per week. Formerly PO 110. Geometrical methods applied to the optics of lenses, mirrors and prisms. Thin lens eye models, magnification, astigmatism, prism properties of lenses, thick lenses. (F) Mandell

102. Optical Systems and Physical Optics. (3) Two 2-hour lectures and one 2-hour laboratory per week. Prerequisites: Vision Science 101 or consent of instructor. Formerly PO 111. Principles of optical systems, desire for visual perfection, optical interference, color, cuts and stops, aberrations. Selected topics in physical optics theory, diffraction, interference, polarization, and their applications. (SP) Klein

103. Normal and Abnormal Optics of the Eye. (2) Two 1-hour lectures per week. Prerequisites: 101 or consent of instructor. Formerly OPM 126. The eye as an optical instrument, image forming properties, optical defects and image quality. Ocular metrology, schematic eyes. The nature, etiology, incidence, course and management of strabismus, ametropia, and photophobia. Met hod s to correct and control refractive error. (SP) Carter

105. Anatomy of the Eye and Orbit. (5) Two 1½-hour lectures, one 1-hour lecture per week and one 3-hour laboratory every other week. Formerly Physio-

logical Optics 101. Gross and microscopic anatomy of orbital bones, appendages, face, muscles, and blood vessels. Histology of the eye, ocular surface, corneal innervation, ocular surface, and autonomic visual pathways. Embryology of the visual system. (F) Van Sluyters

107. Ocular Physiology. (3) Two 1-hour lectures and one 2-hour laboratory per week. Formerly Physiological Optics 126. Basic physiology of the eye. Local vision, visual functions, transparency, nutrition, transport and hydration. Aqueous humor. Structure and function of the crystalline lens, iris, vitreous, retina, choroid and sclera. (SP) Miller, Bonanno

110. Central Pathways and Functions. (2) Twenty 1-hour lectures and four 2-hour laboratories per week. Formerly Physiological Optics 132. Basic concepts of neuronal organization, anatomy and physiology. Structure and function of the posterior retina and peripheral visual pathways. Electrophysiological methods. Photochemistry, photodetectors, lateral interactions, thresholds, and adaptation. Spatial and temporal properties. (F) Cohn

112. Light and Color Sensitivity. (3) Two 1-hour lectures and four 2-hour laboratories per week. Prerequisites: Vision Science 111 or consent of instructor. Formerly Physiological Optics 134. The visual stimulus and photomotor. Visual receptors, light sensitivity, retinal receptors and color vision, color vision abnormalities. Change in light and color vision associated with disease, aging, and light exposure. (SP) Adams

114. Normal and Abnormal Vision Development. (1) One 1-hour lecture per week. Formerly Physiological Optics 133. Normal development of the visual pathways including optics, anatomy, and physiology. Visual deprivation and abnormally. Genetic and experiential factors and psychophysical functions. (F) Freeman

115. Infant Vision. (1) One 1-hour lecture per week. Prerequisites: 103 and 105 or consent of instructor. Formerly OPM 136B. Development of the eye and visual system. Assessment of visual function in the developing eye. Development of color vision, binocular vision, visual motor functions, visual sensitivity and perception. Refraction and refractive error in infants. (F) Banks

117. Oculomotor Functions and Neurology. (2.5) Two 1-hour lectures and seven 2-hour laboratories. Prerequisites: 105 and 110 or consent of instructor. Formerly Physiological Optics 129. Kinematics and reference axes for ocular rotations. Topographical and physiological factors and stimuli-respon se relationships for eye movements, accommodation and the pupil. Anomalies of eye movements, accommodation and pupil activity. (SP) Stark

118. Binocular Vision and Space Perception. (3) Two 1-hour lectures per week and eight 2-hour laboratories. Prerequisites: 101 and 105 or consent of instructor. Formerly Physiological Optics 128. Perception of depth, distance, and orientation. Binocular binocular correspondence. Convergence, binocular influence and phenomena of binocular vision development. Sensory vision, eye movement, static and dynamic stereopsis, binocular depth cues. (SP) Schor

198. Group Studies for Advanced Undergraduates. (1-4) Supervised group study. Must be taken on a pass/not passed basis. Prerequisites: 101, 105 or consent of instructor. Formerly Group Studies 128. (SP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a pass/not passed basis. Prerequisites: Upper division status and consent of instructor. Formerly Physiological Optics 198. (F) Staff

201A. Seminar in Physiological Optics. (2) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: Consent of instructor. Graduate seminar in physiological optics. (SP) Staff

201B. Seminar in Physiological Optics. (2) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: Consent of instructor. Graduate seminar in physiological optics. (SP) Staff

202. Visual Evoked Potentials. (3) Four hours of seminar per week. Prerequisites: Graduate standing in physiological optics, or consent of instructor. Basis of visual evoked potentials, including application to visual development and deprivation, objective testing, functional analysis of the visual brain, instrumentation, and future developments. Contributions from positron emission tomography. (F) Staff

204. Optical Image Formation in the Eye. (3) Two 1-hour lectures and two 2-hour laboratories per week. Prerequisites: Graduate standing in physiological optics, or consent of instructor. Lectures and laboratory demonstrations. Measurement of optical properties of simple and compound eyes. Image quality and resolution. Optometric instrumentation. (F) Klein

206. The Oculomotor System. (3) Two 1-hour lectures and two 2-hour laboratories per week. Prerequisites: Consent of instructor. Lectures and laboratory demonstrations on mechanical, physiological, sensori-analytical, and behavioral aspects of ocular accommodation, and monocular and binocular eye movement responses. (SP) Stark

207. Simulation of Visual Systems. (3) Two hours of lecture and 6 hours of laboratory per week. Prerequisites: Graduate standing or permission of instructor. Analysis of eye movement and systems from a control and systems approach is made available to non-engineers, using computer simulation techniques, and computer-oriented display programs. (F) Stark

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 permission of instructor. Basic concepts of radionuclide, photography and colorometry. Optical test systems, video and oscilloscope stimulus generation and calibration. Neurophysiological and biophysical techniques for measurement of eye movements, pupil, accommodation, ERG, EOG, visual evoked potential, pupil physiology. Psychophysical methodology, signal detection, computer control of stimuli, data acquisition and processing. Clinical assessment of ocular components; eye examination and function. (SP) Adams

212A. Optics and Dioptrics of the Eye. (2) Two 1½-hour lectures per week for 5 weeks plus library assignment. Prerequisites: Permission of instructor. Introduction for graduate students to basic principles of classical and modern geometric optics (thick lens systems, mirrors, prisms, apertures and stops) and physical optics (interference, diffraction and polarization) with emphasis on dioptrics of the human eye (including schematic eyes, aberrations and emotive phenomena). (F) Staff

212B. Visual Neurophysiology and Development. (2) Two 1½-hour lectures per week for 8 weeks plus library assignment. Prerequisites: Permission of instructor. Introduction for graduate students. Visual pathways will be considered from retina to lateral geniculate through visual cortex. Each stage will be covered. Primary focus will be studies of receptive field characteristics and associated visual behavior. Development and plasticity of the visual system will also be covered. Experiments and implications will be explored from controlled rearing procedures and studies of normal visual experience. (F) Freeman

212C. Spatial Vision and Machine Vision. (2) Two 1½-hour lectures per week for 5 weeks plus library assignment. Prerequisites: Permission of instructor. Introduction for graduate students to human spatial vision. Contrast sensitivity, visual acuity and spatial
212D. Anatomy and Vegetative Physiology of the Eye. (2) Two 1½-hour lectures per week for 5 weeks. Prerequisites: Consent of instructor. Introduction for graduate students to a general survey of the orbit, anterior and posterior segment of the eye, extracellular muscles, and neuroanatomy of the eye. Vegetative physiology of the cornea and tear film, aqueous humor, crystalline lens, vitreous humor, epithelial tear film (iris, ciliary body and retina), and photoreception. (F) K. DeValois

212E. Color Vision and Visual Sensitivity. (2) Two 1½-hour lectures per week for 5 weeks. Prerequisites: Permission of instructor. Introduction for graduate students to sensory aspects of light and color vision including: psychophysical methods, spectral response of the eye, mechanisms of sensitivity control, dark adaptation, color discrimination, mechanisms of normal and defective color vision. (F) Cohn

212F. Eye Movements, Motion Perception and Binocular Vision. (2) Two 1½-hour lectures per week for 5 weeks. Prerequisites: Permission of instructor. Introduction for graduate students to human eye movements, motion perception and binocular vision. (SP) W. DeValois

218. Spatial Aspects of Vision. (2) Course may be repeated for credit with consent of instructor. Two hours of lecture per week. Prerequisites: 112 or consent of instructor. Selected topics from stereopsis and binocular interactions, binocular disparity, binocular space perception and anomalies of binocular vision. (SP) Schor

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 vision focusing on fundamental aspects of binocular vision, binocular interactions, binocular disparity, binocular space perception and anomalies of binocular vision. (SP) Schor

222. Application of Vision Psychophysics to Clinical Disorders. (9) 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 chorioretinal damage, corneal and aqueous humour, glaucoma, strabismus, amblyopia, and various degrees of visual impairment. Study of basic laboratory procedures which may be applied to allow identification of specific visual disorders in the visual pathways. (SP) Enoch, Adams

252. Neurobiology of Visual Development. (2) Course may be repeated for credit. Two hours of lecture or seminar per week. Prerequisites: Consent of instructor. Reading and critical discussion of neurobiological studies of developing mammalian visual systems. Evaluation of the role of innate environmental factors in specifying the development of central visual pathways. (SP) Van Suyters

260. Vegetative Physiology of the Eye. (3) Four hours of lecture per week. Prerequisites: Graduate standing and a course in calculus. Detailed analysis of the vegetative functions of the eye. Mass and heat transfer in the cornea, sclera, lens, and vitreous body. The formation of aqueous humor and the relation of intraocular pressure to the rates of formation and drainage. (SP) Miller

296. Group Studies, Seminars, or Group Research. (1-6) One to four hours of lecture per week. Group study of selected topics. Advanced studies in various subject areas. Special seminar topics to be selected each year. Informal groups studying special problems, group participation in experimental problems and analysis. (F, SP) Staff

299. Research in Physiological Optics. (1-12) Varied. Prerequisites: Consent of instructor. (F, SP) Staff

601. Individual Study for Master's Students. (1-6) Units may not be used to meet either unit or residence requirements. Must be taken on a satisfactory/un satisfactory basis. Prerequisites: Consent of instructor. Individual study for the comprehensive requirements in consultation with the advisor in physiological optics. (F, SP) Staff

602. Individual Study for Doctoral Students. (1-6) May not be used for unit or residence requirements. Must be taken on a satisfactory/un satisfactory basis. Prerequisites: Consent of instructor. Individual study in consultation with the advisor in physiological optics, intended to provide an opportunity for qualified students to prepare themselves for the various examination required for the Ph.D. (F, SP) Staff

Professional Courses

401. Applications of Electronics and Computers. (2) Two hours of lecture and 2 hours of laboratory per week. Prerequisites: Graduate standing in physiological optics, optometry student status, or consent of instructor. The study of vision requires the application of electronic and computer techniques. Topics will cover the recording of bio-electric phenomena, and recording apparatus, transducers, signal averaging, and other computer processing and displays, and computer interactive systems used in physiological optics and optometry. (F, SP) Staff

Interdepartmental Studies Courses

Upper Division Courses

*IDS 114A-114B. Advances in Aging: Alzheimer's Disease; Biological and Social Dimensions. (2,2) One 2-hour lecture per week in the evening. Prerequisites: High school biology and chemistry. This interdisciplinary course will single out specific topics in aging of great current interest (fall, Alzheimer's disease; spring, strategies for intervention) and present lectures on all aspects of each topic (biomedical, health, socio-economic, legal and ethical). Invited speakers with special expertise in these areas will participate. Sponsoring departments: Optometry, Social Welfare, Public Health, and Molecular and Cell Biology.

*IDS 119. Multidisciplinary Studies and Field Experience in Aging. (2) Sponsoring departments: Optometry, Social Welfare Public Health, and Molecular and Cell Biology. One 2-hour seminar per week for seven weeks and 6 hours of field work. Prerequisites: Upper division or graduate student and consent of instructor. Study of adults 70 years and over. Students will visit older patients from local geriatric clinic and confer with clinic staff. One hour weekly seminar consists of lecture by faculty on aging from specific discipline. Other hour is devoted to case presentation by student on a patient's condition. Course grade based on student participation and final paper demonstrating understanding of interdisciplinary nature of aging and caring for older people.

Related Courses in Other Departments

Psychology 210A. Proseminar: Sensory Processing. (3)

Psychology 210D. Proseminar: Perception. (3)

Oriental Languages

(Organization of Letters and Science)

Department Office: 104 Durant Hall, 642-3480
Chair: Jeffrey Riegel, Ph.D.

Professors:
Haruo Asahi, Ph.D. University of California. Japanese linguistics
John C. Jamieson, Ph.D. University of California. Medieval Chinese texts, Korea
Lewis R. Lancaster, Ph.D. University of Wisconsin. Buddhist and Buddhist text
William H. McCulloch (Agassiz Professor), Ph.D. University of California. Classical Japanese literature
Tong Pang-Hsin, Ph.D. University of Washington. Chinese linguistics
Stephen West, Ph.D. University of Michigan. Medieval Chinese literature
Cyril Birch (Agassiz Professor Emeritus), Ph.D. University of London. Vernacular Chinese literature
Kun Chang (Emeritus), Ph.D. Yale University. Chinese linguistics
Helen C. McCullough (Emerita), Ph.D. University of California. Japanese, early Chinese literature

Associate Professors:
James E. Bosson, Ph.D. University of Washington. Alatcic and Tibetan languages
H. Samuel Cheung, Ph.D. University of California. Chinese vernacular literature, linguistics
Van G. Gassell, Ph.D. Columbia University. Modern Japanese literature
Judith Riegel, Ph.D. Stanford University. Early Chinese texts
Michael Strickmann, Ph.D. Ecole Pratique des Hautes Etudes, Buddhiam, Taoism, medieval Chinese cultural history
Ferdinand Morand (Emeritus), Ph.D. Stanford University. Japanese drama, modern literature and film

Assistant Professors:
H. Mack Horton, Ph.D. University of California. Classical Chinese language
Ann Lee (Acting), Columbia University. Korean language and literature
Lydia H. Liu, Ph.D. Harvard University. Modern Chinese literature, comparative literature

Professor-In-Residence:
Donald H. Shively, Ph.D. Harvard University. Japanese literature and History

Lecturer (SOE):
Cecilia Chu, M.A.

Lecturers:
Miodor Indo, B.A.
I-Hao Lui, B.A.
Sez-Yun Liu, B.A.
Kay Richards, M.A.
Sawatosho
U Lin Shih, B.A.
Takako
Seiji Watanabe, B.A.
Aya Yoshino, B.A.
Claire You, M.A.

Major Advisers: Consult Undergraduate Office.
Graduate Advisers: Mr. Cheung (Chinese); Mr. Aoki (Japanese)

The Department of Oriental Languages at Berkeley offers a thorough training in the classical and modern languages and literatures of Eastern Asia. The Eastasian Library, which houses one of the largest American collections of materials related to China, Japan, Korea, and Tibet, is located on the Berkeley campus. A student selects one area of emphasis in the undergraduate major program: Chinese, Japanese, or Alatic languages. In all cases students proceed from initial acquisition of a facility in the spoken language to a reading knowledge of both modern and classical forms. Individual upper division courses stress the philological, linguistic, or literary study of East Asian cultures, and students are encouraged to select courses that will provide them with an insight into each of these disciplines. The department also emphasizes the study of a particular East Asian culture in its broader geographical context.

*On leave, fall
*Recalled to active service
†Recipient of Distinguished Teaching Award
The Major

Emphasis on Chinese

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 classical Chinese (161, 163, 165, 167); 4 units of modern Chinese (154, 156, 158); 8 units of classical Chinese (chosen from among 140, 145, 148, 150, 151, 153, 155, 157, 170A, 170B); 4 additional units of departmental courses in Chinese or in departmental lecture courses on Chinese subjects.

Total units required: 62.

Emphasis on Japanese

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 123 (4); 4 additional units of classical Japanese (124 or 125 or 126 or 127 or 128 or 129); Japanese 162 (4); Oriental Languages 133A-133B (4-4); 4 additional units in departmental courses in Japanese.

Total units required: 56.

Emphasis on Altaic Languages

Lower Division. Korean 1A-1B (5-5) and Korean 10A-10B (5-5); or Japanese 1A-1B (5-5) and Japanese 10A-10B (5-5); or Near Eastern Studies, Turkish 1A-1B (5-5); Linguistics 5 (4). Linguistics 5 may be taken on a passed/not passed basis.

Upper Division. Altaic 144A-144B (4-4), Altaic 154A-154B (4-4) and other relevant courses designated by the adviser (e.g., Altaic 177A-177B (4-4), Korean 100A-100B (5-5), Turkish 100A-100B (5-5), Turkish 101A-101B (5-5), and Near Eastern Studies 170A-170B (3-3)) to make a total of 57 lower and upper division units.

Honors Program

An undergraduate student who has completed 12 units of upper division 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 H195 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 H195, the student will undertake independent advanced study under the guidance of appropriate members of the staff. Upon satisfactory 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, in Classical Chinese, and in Japanese Language and Literature. The M.A. degree is in Chinese Language and Literature, with emphasis on Mongolian. Information concerning graduate degree requirements may be obtained from the department office.

Prospective graduate students are urged to acquire an active command of their language of emphasis as early as possible. Toward this end, a period of study at the Inter-University Program for Chinese Language Studies in Taipei, Taiwan, or at the Inter-University Center for Japanese Language Studies in Yokohama, Japan, both institutions co-sponsored by the University of California at Berkeley, is strongly recommended.

Oriental Languages—General

(Courses in which knowledge of an Oriental language is not required.)

Lower Division Courses

38. Seminars for Lower Division Students. (2) (1-4) To be arranged. Must be taken on a passed/not passed basis. Prerequisites: Lower Division Standing, 3.5 GPA. The main concern of the courses will be critical and analytical study. A substantial term paper will be required. (F,SP) Staff

98. Directed Group Study for Lower Division Students. (1-4) To be arranged. Must be taken on a passed/not passed basis. Prerequisites: Lower Division Standing, 3.5 GPA. The main concern of the course will be critical and analytical study. A substantial term paper will be required. (F,SP) Staff

Upper Division Courses

116. The Classics of Chinese Philosophy. (4) Three 1-hour lectures per week. 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

121. Development of Buddhism in East and Inner Asia. (4) Three 1-hour lectures per week. Formerly CR LANG 151AB. A study of the Buddha-tradition as it is found in contemporary life in East Asia. The course will focus on China, Korea, Japan, Singapore, Taiwan, and China (Tibet). Students will be asked to explore the relationship that exists between Buddhist and other religious traditions, as well as political and social factors which are influencing its development. (F) Lancaster

122. Buddhism and Contemporary Society. (4) Three 1-hour lectures per week. A study of the Buddhism tradition as it is found in contemporary life in East Asia. The course will focus on China, Korea, Japan, Singapore, Taiwan, and China (Tibet). Students will be asked to explore the relationship that exists between Buddhist and other religious traditions, as well as political and social factors which are influencing its development. (F) Lancaster

131A. Chinese Literature in Translation. (4) Two 1½-hour lectures per week. Lectures on principal genres, authors, and individual works of Chinese literature from the beginnings to the fourteenth century. (F) Staff

131B. Chinese Literature in Translation. (4) Two 1½-hour lectures per week. Lectures on principal genres, authors, and individual works of Chinese literature from the fifteenth century to the present. (SP) Liu

133A. Survey of Japanese Literature in Translation. (4) Three 1-hour lectures per week. A survey history of Japanese literature from 720 A.D. to 1700. Major works of poetry, belles-lettres, fiction, and drama will be read and analyzed, each being placed within a historical context. (F) Horton

133B. Survey of Japanese Literature in Translation. (4) Three 1-hour lectures per week. A survey history of Japanese literature from 1700 to the present. Lectures will cover important literary figures and developments; genres of literature; and critical evaluation of texts. (SP) Staff

134. Seminar in Classical Women Writers of Japan. (4) Three 1-hour seminar per week. Prerequisites: 133A or permission of instructor. Critical readings in English translation of the chief women writers of Japan up to the fourteenth century, with attention to their so-

Chinese

Instructor approval is required for enrollment in language courses.

Lower Division Courses

1A-1B. Elementary Chinese, (5-5) Five 1-hour meetings plus one 1-hour language laboratory and one 1-hour tutorial per week. Prerequisites: A is prerequisite to B. (F,SP) Staff

135A. Korean Literature in Translation. (4) Three 1-hour lectures per week. Formerly 135. This is a course on Korean literature from the 12th century to the mid-20th century. Readings include selections from mythology, folklore, pansori oral narrative, drama, poetry and fiction, with collateral readings in literary criticism and history. Comparative reference to Chinese and Japanese traditions of literature will also be made when relevant. (F) A. Lee

135B. Korean Literature in Translation. (4) Three 1-hour lectures per week. Formerly 135. In this course, we will read 20th-century Korean literature from the 1940s to the present. Our readings include poetry, fiction, and drama by authors such as O Young-su, Kim Tong-ni, Hwang Sun-won, Pak Wan-so, Sin Tong-yop and Kim Chi-ki. Readings and discussion will be in English, with Korean works. We will also examine Western literary theory in light of our readings in Korean literature. (SP) A. Lee

137. Japanese Drama, (4) Three 1-hour lectures per week. Lectures will cover the three major forms of Japanese drama: No, Bunraku, and Kabuki. Readings will consist of translations of plays and selections of writings on drama in general. A theme of the course will be to contrast Japanese with European theatre. (F,SP) Staff

167. Introduction to Chinese Philosophy. (4) Two 1½ hours of lecture and one 1-hour discussion per week. A survey of the history of Chinese philosophy from late Chow times through the Ch'in dynasty. Treated in some depth are a number of major Chinese thinkers including Confucius, Mencius, Hsun Tzu, Mo Tzu, Chuang Tzu, Tung Chung-shu, Chu Hsi, Wang Yang-ming, and Tai Chen. One of the major themes presented in the course is the development of Chinese ethical theory and the role of language in moral education. (Also listed as IDS 167 and Philosophy 167). (SP) Riegel

H195A. Honors Course, (2-5) Course may be repeated for credit. To be arranged. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Senior honors candidates in Oriental Languages. Directed independent study and preparation of senior honors theses. Limited to senior honors candidates in Oriental Languages (for description of Honors Program, see Index). (F,SP) Staff

H195B. Honors Course, (2-5) Course may be repeated for credit. To be arranged. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Senior honors candidates in Oriental Languages. Formerly H165. Directed independent study and preparation of Senior Honors Thesis. Limited to Senior Honors candidates in Oriental Languages (For description of Honors Program, see Index). (F,SP) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. To be arranged. Must be taken on a passed/not passed basis. Prerequisites: Junior standing. Small group instruction in topics not covered by regularly scheduled courses. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations listed in the Letters and Science bulletin. (F,SP) Staff
2A-2B. Introduction to Classical Chinese. (4;4) Three 1-hour lectures per week. Characters, radicles, grammar; easy readings in pre-Han, Han, Six dynasties, and Tang periods. (F,SP) Riegel, Jamieson

5. Read Chinese for Mandarin Speakers. (5;5) Five 1-hour meetings in class and two 1-hour lab per week. Prerequisites: Chinese 1A-1B. An intensive reading course designed for those who speak Mandarin but do not read or write in Chinese. The course teaches both pinyin and simplified characters, introduces functional vocabulary, and provides a systematic review of grammar. (F,SP) Cheung

10A-10B. Intermediate Chinese. (5;5) Five 1-hour meetings plus one hour in language laboratory per week. Prerequisites: 1B, 10A is prerequisite to 10B. (F,SP) Chu

Upper Division Courses

100A-100B. Advanced Chinese. (5;5) Five 1-hour meetings 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. (F,SP) Chu

101. Readings in Modern Chinese. (4) Three 1-hour lectures per week. Must be taken on a pass/failed basis. Prerequisites: 100B. Reading of current political, literary, and social materials and discussion, in Chinese, of contents. (F) Staff

102. Survey of Chinese Literature. Three 1-hour meetings per week. Prerequisites: 100B, 102A, 102B, 102C, and 102D do not have to be taken in sequence. A total of three 1-hour course credits to develop student's reading ability of modern Chinese writings on the development of Chinese literature. Class conducted in Chinese.

*102A. Pre-Han. (4)
*102B. Wei-Jin Through Tang. (4)
*102C. Song-Yuan. (4)
*102D. Song-Yuan. (4)

140. Readings in Chinese Buddha Texts. (4) Two 1-hour reading/lecture per week. Prerequisites: One upper division course in classical Chinese. Formerly Chinese 140AB. (F) Lancaster

145. Taoist Texts. (4) Two 1-hour lectures per week. Prerequisites: 2B. Readings in printed and manuscript sources. (F) Strickmann

*146. Documents On the Chinese World Order. (4) Two 11/2-hour reading/lecture meetings per week. Prerequisites of classical Chinese, including 170A(formerly 109). Phenological analysis of documents pertaining to the Chinese tributary system, ca. B.C. 100- ca. A.D. 1280. The selection of documents is designed to illustrate, in specific historical contexts, the tension between rhetoric and reality, and to contrast the Sinic Zone with the Inner Asian Zone. (F) Staff

150. Ancient Chinese Prose. (4) Two 11/2-hour lectures per week. Prerequisites: 2A. Readings in historical, religious, and philosophical texts of the Chou and Han periods from printed and manuscript sources. (F) Riegel

151. Ancient Chinese Poetry. (4) Two 1-hour lectures per week. Prerequisites: 2A. Readings from the Shih-chu, the Classic of the Odes, the Chi, and selections from Han dynasty fu. (F,SP) Riegel

155A-155B. Readings in Early Medieval Literature. (4;4) Two 1-hour lectures per week. Prerequisites: 2B and one upper division course in classical Chinese. A different theme or literary form will be studied each semester. (F,SP) Strickmann

154. Readings in Vernacular Chinese Literature. (4) Three 1-hour lectures per week. Prerequisites: 100B. A critical study of pre-modern Chinese fiction. (F) Cheung

155. Readings in Later Medieval Poetry. (4) Course may be repeated for credit as topic varies. Two 11/2-hour lecture/reading per week. Prerequisites: 2B. Analysis of semantic, structural, and sonorous aspects of poems (both shih and twu) of the T’ang. Five Dynasties, and Sung periods, to reveal how their interplay makes “poetry.” (F,SP) Staff

156. Readings in Vernacular Chinese Literature: Drama. (4) Two 1-hour lectures per week. Prerequisites: 100B. Yuan-Ming drama, readings at fourth year level. (F,SP) Staff

157. Readings In Late Medieval Prose. (4) Course may be repeated for credit as topic varies. Two 11/2-hour lectures per week. Prerequisites: 2B. Philological, grammatical, and literary analysis of prose texts from the Sung, Chin, and Yuan periods. Texts will include ku-wen essays, historical works, funeral inscriptions and epitaphs, scholarly notes (pi-chi), administrative documents including memorials and rescrits, and writings on classical scholarship and thought. (F) Staff

158. Modern Chinese Literature. (4) Two 11/2-hour lectures per week. Prerequisites: 100B. Texts read in Chinese, but class conducted in English. (SP) Liu

161. Structure of the Chinese Language. (4) Two 1-hour lectures per week. Prerequisites: Linguistics 5 or 100. Chinese dialects, Mandarin phonology, and Mandarin grammar. (F) Ting

*163. Cantonese Linguistics. (4) Three 1-hour lectures per week. Prerequisites: 100A and Linguistics 5 or 100. A linguistic analysis of Cantonese with emphasis on its phonological and grammatical differences from Mandarin. (F,SP) Cheung

165. History of the Chinese Language. (4) Two 1-hour lectures per week. Prerequisites: Linguistics 5 or 100. Writing system, early dictionaries, historical phonology, and classical grammar. (SP) Ting

167. Chinese Dialectology. (4) Three 1-hour lectures per week. Prerequisites: 161 and Linguistics 5 or 100. An introductory survey 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. (SP) Ting

170A-170B. Chinese Bibliography and Research Method. (4;4) Three 1-hour lectures per week. Prerequisites: One upper-division course in classical Chinese. Formerly Chinese 109. Introduction to a range of research tools necessary for research on aspects of Chinese civilization, with an emphasis on history and literature of the premodern period. Includes analysis of materials, problem sets, and extensive readings. In the first semester, an exam and paper are among the requirements. The second semester will require polished written translations and a term paper. (F,SP) Jamieson

Japanese

Instructor approval is required for enrollment in language courses.

Lower Division Courses

1A-1B. Elementary Japanese. (5;5) Five 1-hour meetings plus one 1-hour language laboratory and 1-hour tutorial per week. Prerequisites: A is prerequisite to B. (F,SP) You, Richards

10A-10B. Intermediate Japanese. (5;5) Five 1-hour meetings plus one 1-hour laboratory per week. Prerequisites: 1A is prerequisite to 1B. (F,SP) Takaku

Upper Division Courses

100A-100B. Advanced Japanese. (5;5) Five 1-hour lectures per week. Prerequisites: 100A. A is prerequisite to B. (F,SP) You, Richards

Korean

Instructor approval is required for enrollment in language courses.

Lower Division Courses

1A-1B. Elementary Korean. (5;5) Five 1-hour meetings plus one 1-hour language laboratory and 1-hour tutorial per week. Prerequisites: A is prerequisite to B. (F,SP) You, Richards

10A-10B. Intermediate Korean. (5;5) Five 1-hour meetings per week. Prerequisites: 1B; A is prerequisite to B. (F,SP) You, Richards
Graduate Courses

201. Japanese Bibliography. (4) Three 1-hour lectures per week. Prerequisites: 100B. Japanese references work for literature and history. (F) W. McCullogh

205. Seminar in Early Chinese Fiction. (4) One 3-hour seminar per week. Studies in the historical development of Chinese fiction and critical analysis of selected texts from the Ming/Ch'ing period. (F) Cheung

206. Chinese Vernacular Literature. (4) One 3-hour seminar per week. Detailed study of a text with its literary and historical background. (SP) Liu

210. Seminar in Buddhism and Buddhist Texts. (4) One 3-hour seminar per week. (F) Lancaster

212. Seminar in Chinese Literary History. (4) One 3-hour seminar per week. Textual and aesthetic criticism. (F) Strickmann

213. Seminar in Philological Analysis of Ancient Chinese Texts. (4) One 3-hour seminar per week. Prerequisites: Chinese 150 or 151. Analysis of classical texts and inscriptions. (F) Riegel

215. Tun-Huang Studies: Manuscript Tradition in Medieval China. (4) One 3-hour seminar per week. Emphasis on textual comments and an introduction to the methods of textual criticism. (SP) Strickmann

216. Texts on the Civilization of Medieval China. (4) One 3-hour seminar per week. (F) Staff

218. Seminar on the Sources for the Traditional Chinese World Order. (4) One 3-hour seminar per week. Prerequisites: Consent of instructor. Cultural, social, economic, and political factors in the operation of the tributary system of the Chinese empire. (SP) Li

236. Seminar in Chinese Linguistics. (4) One 3-hour seminar per week. Prerequisites: Chinese 161 or 165. The topic varies according to the interests of the participants: dialectology, phonology, or grammar. (F) Ting

239. Seminar in Japanese Linguistics. (4) One 3-hour seminar per week. Prerequisites: Japanese 162 or consent of instructor. The topic varies according to the interests of the participants: dialectology, phonology, or syntax and semantics. (F) Aoki

240. Seminar in Prewar Japanese Literature. (4) Course may be repeated for credit. One 3-hour seminar per week. Prerequisites: Graduate standing and permission of instructor. Formerly 249. Reading and critical evaluation of selected texts in prewar (1868-1940) Japanese fiction, drama, or poetry. The seminar topic, chosen by the instructor, will be different each time the course is taught. (F) Staff

249. Seminar in Postwar Japanese Literature. (4) Course may be repeated for credit. One 3-hour seminar per week. Prerequisites: Graduate standing and permission of instructor. Formerly 249. Reading and critical evaluation of selected texts in postwar (1940-present) Japanese fiction, drama, or poetry. The seminar topic, chosen by the instructor, will be different each time the course is taught. (F) Staff

250. Seminar in Classical Japanese Drama. (4) One 3-hour seminar per week. Prerequisites: Japanese 123, 124, 125 or 128. Analysis and discussion of major plays from the no and kabuki theaters. Selections from the works of Zeami and Chikamatsu will be made in alternate years. (SP) Staff

269. Seminar in Classical Japanese Poetry. (4) Course may be repeated for credit. One 3-hour seminar per week. Prerequisites: Japanese 124. 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. (SP) Staff

275. Historical Documents. (4) Two 1-hour lectures per week. Prerequisites: Consent of Instructor. Course concentrates on the late Nan Bei-chao through Five Dynasties periods. Topics vary from semester to semester and include poetry, biography, historiography and social relations. (F, SP) Staff

289. Directed Study for Graduate Students. (1-9) Course may be repeated for credit. Special tutorial or seminar on selected topics not covered by available courses or seminars. (F, SP) Staff

299. Thesis Preparation and Related Research. (1-9) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of thesis supervisor and graduate adviser. (F, SP) Staff

601. Individual Study for Master's Students. (1-9) Units may not be used to meet either unit or residence requirements for a master's degree. Course may be repeated for credit. Maximum of 18 units. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of graduate adviser. (F, SP) Staff

602. Individual Study for Doctoral Students. (1-9) May not be used for unit or residence requirements for the Ph.D. degree. Course may be repeated for a maximum of 16 units. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare for various examinations required of candidates for the Ph.D. (F, SP) Staff

Paleontology

(College of Letters and Science)

The biological sciences at Berkeley were reorganized in July 1988. Consult staff in the Department of Integrative Biology for information on graduate and undergraduate programs in paleontology. Undergraduate students who desire to declare a paleontology major before fall 1989 may continue in the program provided they complete all degree requirements and graduate before fall semester 1993.

Parasitology

(School of Public Health, Interdepartmental Graduate Groups)

Office: 19 Warren Hall, 642-6531
Chair: James L. Hardy, Ph.D.

Professors:
Nina M. Agabian, Ph.D. (Biomedical and Environmental Health Sciences)
John B. Anderson, Ph.D. (Entomology and Parasitology)
Frederick L. Duran, M.D. University of California at San Francisco (Environmental Health Sciences)
Robert S. Goldsmith, M.D. University of California at San Francisco (Environmental Health Sciences)
Joseph Hardy, Ph.D. (Biomedical and Environmental Health Sciences)
Donald A. Heyneman, Ph.D. University of California at Berkeley-San Francisco Joint Medical Program
Robert S. Lane, Ph.D. (Entomology and Parasitology)
Constantine H. Tempelman, Ph.D. (Biomedical and Environmental Health Sciences)
Neylan A. Verdios, Ph.D. (Biomedical and Environmental Health Sciences)
Ching C. Wang, Ph.D. University of California at San Francisco (Pharmaceutical Chemistry)
Claudia J. Weinmann, Ph.D. (Entomology and Parasitology)

Associate Professors:
John E. Simms, Ph.D. (Biological Ecology)
Wayne P. Sousa, Ph.D. (Biological Ecology)

Assistant Professor:
James H. Leech, M.D. University of California at San Francisco (Infectious Diseases)

Lecturers:
Anne H. Good, M.D., Ph.D. (Molecular and Cell Biology)
George O. Pohler, Ph.D. (Entomology and Parasitology)
The Program

forms, and special attention is directed to parasites

dents are located in the administrative units of the

gree in a biological science may be admitted to the

cover a broad range of invertebrate and microbial

The Major

The degree of Bachelor of Arts will be granted on

I. University Requirements

II. Breadth Requirements: (A) Two courses beyond the subject A level in reading and composition; (B) Proficiency in a language other than English at a level prescribed by the College of Letters and Science; (C) One course involving analytic reasoning; and (D) One course from each of the following fields: (1) the humanities, (2) the natural sciences, (3) the social sciences.

III. Major Requirements: Introductory Courses—PACS 10: Peace Studies 101; (2) Core Courses—One course from each of the following five areas: (1) Social Change and World Order; (2) International Conflict; (3) Political Economy; (4) Ethics and Ideology; and (5) Ecology. Area of Concentration: Six upper division courses focusing on a particular area in Peace and Conflict Studies formulated by students in collaboration with their advisers.

Advanced Courses: Critical Approaches to Peace Studies and Research (PACS 100); Theories and Methods in Peace and Conflict Studies (PACS 101); Internship Program/Peace Work as a Profession (PACS 186/187) and Senior Seminar (PACS 190), Student programs should include at least one course in each of the following categories: cultural, ethnic, and gender diversity as well as class relations.

The complete version of the PACS major requirements which includes a listing of acceptable courses meeting major course requirements is available from the PACS office.

Lower Division Courses

10. Introduction to Peace and Conflict Studies. (4) Two 1½-hour lectures and 1½-hour section per week. Formerly 100. This course will explore the political and social causes of conflict and the processes that lead to ecological social integration, justice and peace. The course will be based on guest lectures and readings with continuity provided by faculty lectures. This course is required for majors but non-majors are welcome. (F,SP)

98. Directed Group Study. (1-3) Course may be repeated for credit. 1 hour of lecture/group study per week. Must be taken on a passed/not passed basis. Group discussion, research and reporting on selected topics. (F,SP)

99. Supervised Independent Study and Research. (1-3) 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 and department chair; usually restricted to PACS majors. Supervised independent study or research on topics relevant to PACS not covered in depth by other courses. A proposal must be formulated in consultation with the faculty sponsor with clearly stated objectives and means of implementation. (F,SP)

Upper Division Courses

100. Critical Approaches to Peace Studies and Research. (3) Two hours of lecture and two hours of discussion. 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)

101. Theories and Methods in Peace and Conflict Studies. (3) One 3-hour Lecture per week. Prerequisites: 10. This is a course in how to think critically about policy research, in which scientific and value structures are interwoven. It prepares students to make independent, reasoned decisions regarding the explicit integration of scientific considerations and ethical concerns. (SP)

105. Integrative Seminar. (1) Course may be repeated for credit. One 3-hour seminar per week. Must be taken on a passed/not passed basis. A weekly seminar designed to help students identify and emphasis the concepts that unify their diverse coursework. A different theme of the PACS curriculum will be focused on each semester. Strongly recommended for all PACS majors each semester. (F,SP)

119. Special Topics in Peace and Conflict Issues. (1-3) 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. (F,SP)

121. Exploring the Roots of Ethnic Conflict and Cooperation. (4) Three 1½-hour discussion per week. Course will explore some of factors influencing ethnic conflict and cooperation in world, starting with selected countries, then moving to the U.S. and finally to UC Berkeley campus. Consideration of issues which are sources of conflict, competition and confrontation such as housing, education, immigration, politics. Will also focus on examples of ethnic cooperation where different ethnic groups share territory and develop, strategies to co-exist in ways which allow diversity. (F)

124. Issues in Global and Domestic Hunger. (3) Two 1½-hour lectures per week. An introduction to the root causes of hunger, global and domestic, and possible solutions. Topics to be examined include: Overview of basic theories explaining causes of hunger; relationships of political and economic structures with hunger; and critical evaluation of current efforts to alleviate hunger. (F)

127. Human Rights. (3) Course may be repeated for credit. Three hours of seminar per week. Seminar presents a panoramic overview of both the rhetoric and reality underlying domestic and global conflicts on human rights. Special attention to the connection between human rights and peace, differences between the U.S., the Soviet Union and "Third World" approaches. Emphasis on critical analysis of the historical background and implementation problems involved in one or another set of civil-political rights or economic-social-cultural rights. (F,SP)

135. Special Topics in Regional Conflict. (3) Course may be repeated for credit, when a different topic is presented. Two hours of lecture and two hours of discussion. Topics vary from semester to semester. The course will offer a critical interdisciplinary study of geo-political regions and the sources of their conflicts. (F,SP)

140. Soviet-American Relations Since 1917. (4) Two 1½-hour lectures and 1½-hour discussion per week. The U.S.-Soviet conflict stands at the heart of many major issues of peace and justice in the world today. This course will examine important crises and turning points from the Bolshevik Revolution to Reykjavik, looking at both Soviet and American policy. (F)

149. International Conflict and World Order. (3) Two hours of lecture and two hours of discussion per week. Provides an understanding of the present world system, an appreciation of emerging trends and problems in international relations and an opportunity to explore alternatives to meet these challenges. Particular attention will be given to the role of hegemony and power, the ways in which they are changing today and their affects on international security. The op-

Peace and Conflict Studies (Special Studies)

Program Office: T-6 Room 110, 643-6455.
Chair: Eldon Morgen, M.D.
Academic Coordinator: Jerry Sanders, Ph.D.

Affiliated Faculty: Gerald Berreman (Anthropology); Claudia Carr (Conservation and Resource Studies); Owen Chamberlain (Physics); West Churchman (Evolutionary Biology); Diana Connor (History); Troy Duster (Sociology); William R. Ellis (Architecture); John Harte (Economics); Charles Henry (Afro-American Studies); Percy Hsuan (African Studies); John Kelley (Mathematics); Angela Little (Nutritional Sciences); Margarita Melville (Chinese Studies); Carolyn Merchant (Conservation and Resource Studies); Alan S. Miller (Conservation and Resource Studies); Meredith Minkler (Social and Administrative Health Sciences); Carlos Muñoz (Chicano Studies); Laura Nader (Anthropology); Michael Nagler (Classics); John B. Neilands (Molecular and Cell Biology); Frank Newman (Law); Pedro Noguera (Education); Ishmael Reed (English); Arnold Schultz (CRS/Forestry); Charles Schwartz (Physics); Susan Schwik (English); Peter Dale Scott (English); Otto J.M. Smith (Physics); Ronald Takaki (Ethnic Studies); Pravin Varayla (Electrical Engineering and Computer Sciences); Richard Walker (Geography); Michael Watts (Geography); Leon Wolsy (Molecular and Cell Biology); David Wood (Entomological Science).

Affiliated faculty serve as course instructors, student advisers, and supervisors of student projects.

The Program

Peace and Conflict Studies is an interdisciplinary undergraduate program which offers an integrative approach to the study of 1) peace theory and practice in historical perspective; 2) global problems of war, injustice, poverty, and ecological deterioration; 3) the political, ethical, and political dimensions of conflict and nonviolent conflict resolution in domestic, regional, and international contexts; 4) culture and religion, worldview and ideology as factors in conflict and cooperation; 5) visions of, and models for, world order and present efforts to achieve them; and 6) education and other change processes for realizing a more peaceful and just world.
161. War and Peace Movements in Twentieth Century America. (3) Two 1½-hour lectures per week. An examination of anti-war movements which have been an integral component to contemporary U.S. history. The historic roots of these movements will be studied in connection with their impact in shaping U.S. society. (SP)

164. Theories of Nonviolence. (3) Two 1½-hour lectures per week. Special topics in theories of nonviolence as articulated or inferred in the work of its major practitioners. (SP) Nagler

165. Introduction to the Ethics and Value Assumptions in Planning and Systems. (3) Two hours of lecture and two hours of discussion per week. Introduction to the consideration of values and ethics in social planning and policy-making, e.g., in operations research, systems science, policy science cost-benefit analysis, urban and national planning, and world modeling. (F) Churchman

174. Politics of Chemical and Biological Warfare. (3) Three hours of lecture and one hour of discussion per week. More deadly than nuclear weapons? Review of the historical, technical, and institutional origins of current CWB weaponry and policy in the United States. Ethical questions surrounding CWB development, storage, and use. (F) in rotation to student's academic interests and career objectives. Minimum 120 hours/semester work in an agency. Required for PACs majors and normally restricted to them. Must be taken concurrently with PACS 187. “Peace Work As a Profession.” Field Studies cannot be taken concurrently. (SP) Hurst

187. Peace Work as a Profession. (2). One 3-hour seminar per week. Prerequisites: 100; upper division standing or consent of instructor. Supervised internship in selected community agencies concerned with peace and justice. Practical experience related to student's academic interests and career objectives. Minimum 120 hours/semester work in an agency. Required for PACs majors and normally restricted to them. Must be taken concurrently with PACS 187. “Peace Work As a Profession.” Field Studies cannot be taken concurrently. (SP) Hurst

190. Senior Seminar. (2) One Two-hour seminar per week. Students prepare a major analytical paper synthesizing their education and present an oral defense and presentation representing their Area of Concentration. Offered to PACs majors only, to be taken final year of study. (F)

195. Senior Thesis. (3-4) Three hours of research per unit per week. Prerequisites: Senior standing in PACS. Research paper or suitable research project done under the direct supervision of a faculty sponsor. Subject must be approved by faculty sponsor no later than the preceding semester in which the course is to be taken. (F,SP)

197. Field Studies. (1-4) Course may be repeated for credit. Field work and independent meetings with faculty sponsor on the legacy of anti-war movements. Prerequisites: Upper division standing, consent of instructor and PACS chair. Supervised experience relevant to specific aspects of Peace and Conflict Studies in off-campus locations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

198. Directed Group Study for Upper Division Students. (1-3) Course may be repeated as topic varies. Variable. May be taken on a pass/no pass basis. Prerequisites: 2.0 GPA in upper division courses, graduate division standing, consent of instructor, discussion, research, and reporting on selected topics. Student initiative 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 pass/no pass 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)

Interdepartmental Studies Courses

Upper Division Courses

*IDS 173. Technology, Doctrine and Politics of the Nuclear Arms Race. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Upper division standing or consent of instructor. This survey course will examine the interaction of technological innovation, strategic planning, and political processes to understand the dynamics of the nuclear arms race. The course will provide intensive introduction to the literature, and the history of the subject will be studied critically to help in understanding contemporary conditions and the possibilities of future developments. Sponsoring departments: Physics and Peace and Conflict Studies.

*IDS 191. Public Health and Nuclear War. (2) One hour lecture and one hour discussion per week. The course will examine the impact on public health of the current arms race and the threat of nuclear war. Topics to be considered through lecture, discussion, and directed readings include the physical and medical effects of nuclear detonation, as well as the economic, psychological, and health dimensions of destruction from preparation for detonation. Conflict resolution and other preventive measures will be explored and tested. Sponsoring departments: Public Health and PACS.

Petroleum Engineering

(College of Engineering)

Office: 210 Hearst Mining Building, 642-3801

The petroleum Engineering program is designed to prepare students for careers in the petroleum producing industry and related fields. Petroleum engineering deals with the wide array of problems associated with the location, drilling, and completion of oil and gas wells, management of subsurface reservoirs to obtain the greatest recovery of oil and gas, development and application of enhanced oil recovery techniques, lifting of oil to the surface and handling of the produced fluids. Many petroleum engineers are also becoming involved in related energy areas such as extraction of oil from tar sands and oil shales, and geothermal energy production.

The exploration, development, and production of oil and gas, and other fossil fuels, in an environmentally acceptable manner become more and more complex as we continue to consume these exhaustible resources. The best estimates indicate that from two-thirds to three-fourths of all the oil ever discovered in the United States is still in the subsurface reservoirs awaiting the development of new recovery technology.

The petroleum engineering program reflects the energy industry's need for versatile, innovative engineers by providing a strong basic engineering curriculum maintaining a diversity in elective course offerings. Students will be able to channel their own interests by choosing one of the following three program emphases:

1. Mechanical engineering emphasis includes extra courses in physics, mechanical processing and design.

2. Chemical engineering emphasis. Includes physical chemistry, chemical kinetics, and mining principles.


The graduate program in petroleum engineering is offered as a field of study in mechanical engineering, materials science and mineral engineering, and chemical engineering.

Curriculum for the Bachelor's Degree

A total of 120 units is required, including:

Lower Division. Mathematics 1A-1B, 50A-50B; Chemistry 1A-1B; Physics 7A-7B; Engineering 7, 36, 45, 50; Geology 50, 50L; 10 units of electives.

Upper Division. Mechanical Engineering 106, 109; Civil Engineering 130; Electrical Engineering 100; Chemical Engineering 141; Mineral Engineering 106, 116, 146, 147, 148, 149, 150; Geology 111; Engineering 172, 190; 18 units of electives. Electives must include 15 units to satisfy the humanities and social studies requirement and 9 units in technical electives. These 9 units of technical electives will typically include a choice of the following courses, grouped to give different emphases:

1. Mechanical Engineering option: Physics 7C; Mechanical Engineering 102A, 102B, 104, 128, 134, 161, or equivalent 3-unit courses. 2. Chemical Engineering option: Chemical Engineering 140, 142, 150; Chemistry 112A, 120B; or equivalent units in upper division Chemistry or Chemical Engineering courses.

3. Mineral Engineering option: Mineral Engineering 101, 130, and one other 3-unit upper division course with mining, or other preventive measures. 4. Environmental option: Chemistry 115 and additional equivalent courses.

Humanities and Social Studies. Six courses of at least 3 units each in humanities and social studies selected from a list of selected courses in History and Culture, and three 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 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.

For further details, consult the Announcement of the College of Engineering.

Philosophy

(College of Letters and Science)

Department Office: 314 Moses Hall, 642-2722
Chair: Janet Broughton, Ph.D.

Professors:
Charles S. Chihara, Ph.D.
Thompson Clarke, Ph.D.
Hubert L. Dreyfus, Ph.D.
Samuel Scheffer, Ph.D.
John R. Searle, Ph.D.
Hans Sluga, Ph.B.
Frits Staarman, Ph.D.
Barry G. Stroud, Ph.D.
Bruce J. VanNorden, Ph.D.
Bernard Williams, M.A. (Deutsch Professor)
Emeritus, Adams, Ph.D. (Emeritus)
William Craig, Ph.D. (Emeritus)
Donald H. Davidson, Ph.D. (Emeritus) (Slussor Professor)
Paul K. Feyerabend, Ph.B. (Emeritus)
Ernest W. Adams, Ph.D. (Emeritus)
Barry G. Stroud, Ph.D.
Hans Sluga, Ph.B.
Frits Staaarman, Ph.D.
Barry G. Stroud, Ph.D.
Bruce J. VanNorden, Ph.D.
Bernard Williams, M.A. (Deutsch Professor)
Emeritus, Adams, Ph.D. (Emeritus)
William Craig, Ph.D. (Emeritus)
Donald H. Davidson, Ph.D. (Emeritus) (Slussor Professor)
Paul K. Feyerabend, Ph.B. (Emeritus)
Ernest Adams, Ph.D. (Emeritus)
Wallace I. Matson, Ph.D.
Joseph Tussman, Ph.D. (Emeritus)
Gregory Vlastos, Ph.D. (Emeritus)

Associate Professors:
Stephen Neale, Ph.D.
Affiliated Faculty:
Jeremy Waldron, LL.B. Boalt School of Law
Mills Recipient of fundamentals
Richard Wolhelm, Ph.D.

The Major

Lower Division. 12A or 14A, 25A-25B.
Upper Division. 100, 104, 122.
A total of 48 units is required in the major program.
Twenty-four units are required in the upper division in addition to the three required upper division courses: 100, 104, and 122. The student must take one course from the 160-178 series and one course from the 160-184 series and four additional upper division courses (one course numbered 191-199 may be counted among the four only if the major adviser gives written approval). Course 101 does not count as a major requirement.

Philosophy 12A or 14A should be passed before the end of the junior year. Philosophy 100 should be taken as soon as possible after declaring a major. One of the four additional upper division courses may be taken in another department, provided that the course selected is deemed by the major adviser to be relevant to the major.

Honors Program. With the consent of the major adviser, a student with an overall 3.3 grade-point average or higher and a grade-point average of 3.5 or higher 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, admitted on the basis of an application to the department. In order to also require that the candidate write an acceptable honors thesis, for which four units of credit will be given under H195.

The Minor

Required: Philosophy 25A or 25B; Philosophy 104; Philosophy 122; 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 discussion per week. Introduction to ethical and political philosophy.
3. The Nature of Mind. (4) Three hours of lecture and one hour discussion per week. Introduction to the philosophy of mind. Topics to be considered may include the relation between mind and body; the structure of action; the nature of desires and beliefs; the role of the unconscious. (SP) Searle
4. Knowledge and the Limits. (4) Three hours of lecture and one hour discussion per week. Introduction to the theory of knowledge. (F)
5. Science and Human Understanding. (4) Three hours of lecture and one hour discussion per week. Introduction to the Philosophy of Science. (SP) Lloyd
6. Man, God, and Society in Western Literature. (4) Three hours of lecture and one hour 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 well as the influence of Greek 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 or her own life. We will attempt to answer these questions as they are questions that are self-interpreted. (F) Dreyfus
7. Existentialism in Literature and Film. (4) Three hours of lecture and one hour discussion per week. Christian, agnostic, and atheistic existentialism as expressed in the works of Dostoyevsky, Melville, Kafka, Antonioni, Goddard, etc. Dreyfus
8. Introduction to Philosophy of Art. (4) Three 1-hour lectures and one hour discussion per week. This course will deal with the central features of art, and will consider alternative accounts. Topics will include: The definition of art, the institutional theory of art, intention, media of art, ontological-arts work, representation, expression, metaphysics, and values.

12A. Introduction to Logic. (4) Three hours of lecture and two hours of discussion per week. Syntax, semantics, and proof theory of sentential and predicate logic. (SP) Chihara, Adams
12B. Introduction to Logic. (4) Three hours of lecture and two hours of discussion per week. Syntax, semantics, and proof theory of sentential and predicate logic. (SP)
14A. Rudiments of Logic and the Philosophy of Logic. (4) Three hours of lecture and two hours of discussion per week.
14B. Rudiments of Logic and the Philosophy of Logic. (4) Three hours of lecture and two hours of discussion per week.

Upper Division Courses

Unrestricted Course

101. Philosophical Theories. (4) Three hours of lecture and one hour discussion per week. Prerequisites: Open to juniors and seniors who are not majors in philosophy. Two courses from 2, 4, 25A, 25B or have completed, under conditions specified below, course 101. Additional prerequisites are indicated in certain courses.
100. Philosophical Methods. (4) Two hours of lecture and two hours of discussion per week. Prerequisites: Open to juniors and seniors who are not majors in philosophy. 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 the study of selected philosophical texts and through extended training in philosophical writing, based on those texts. Should be taken as early as possible after declaring the major. (SP) Broughton, Vermazen
102. Normative Ethics. (4) Three hours of lecture per week. Prerequisites: One introductory course in philosophy or consent of instructor. Moral philosophy studied through the examination of moral principles, moral problems, and common sense moral intuitions. Specific problems discussed will vary from year to year, but will be drawn from the following: animal rights; fetal rights; world hunger and the obligation to help the needy; killing and letting die; war; choices between love and hate; virtue ethics; justice; and political obligation.
104. Ethical Theories. (4) Three hours of lecture and one hour discussion per week. The fundamental concepts and problems of morality examined through the study of classical and contemporary philosophical theories of ethics. (SP)

105. Foundations of Ethics. (4) Three hours of lecture per week. Prerequisites: 104 or equivalent. An advanced investigation of fundamental questions about the nature of morality. (F)
107. Moral Psychology. (4) Three hours of lecture per week. An investigation of critical issues in moral psychology, such as: free will, weakness of will, self-deception, moral motivation, emotions, virtues, moral education.
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.
111. Aesthetic Theories. (4) Three hours of lecture per week. A study of aesthetic theories based on historical materials.
115. Political Philosophy. (4) Three hours of lecture per week. Analysis of political obligation and related problems. (F) Schettler
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 discussion per week.
125. Metaphysics. (4) Three hours of lecture per week. (F)
126. Philosophy of Religion. (4) Three hours of lecture per week. The nature and the validity of religious ideas. (F) Staal
128. Philosophy of Science. (4) Three hours of lecture per week. A survey of major topics in the logic of science and of other issues coming under the general heading of philosophy of science. (F) Adams, Lloyd
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. (SP)
130. Philosophy of Social Science. (4) Three hours of lecture per week. Prerequisites: Open to juniors and seniors who are not majors in philosophy, economics, sociology, etc.
131. Philosophy of Action. (4) Three hours of lecture per week. A consideration, inter alia, of some of 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? (SP) Davidson
132. Philosophy of Mind. (4) Three hours of lecture per week. Mind and matter; other minds; the concept "person." (F) Searle
133. Philosophy of Language. (4) Three hours of lecture per week.
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 is compared to other sign systems. The foundations of semantics, truth, meaning, reference. Issues of logical form in belief sentences, indirect discourse, sentences about causality, events, actions. Relations between thought and language. (F)

142. Philosophical Logic. (4) Three hours of lecture per week. Major topics in modern logic with an emphasis on the logical aspects of natural language, and their relations to formal logic. Special attention will be given to unsettled questions of logical theory, including the nature of generalizations, time and tense, etc. (F)


148. Probability and Induction. (4) Three hours of lecture per week. Different approaches to the foundations of probability; inductive confirmation of scientific theories.

149. Supplementary Work in Upper Division Philosophy. (2,7,3-3) May be repeated for credit. Meetings to be arranged. Prerequisites: Consent of instructor. Special course designed to facilitate repetition of an upper division course undertaken on the quarter system in which student received a deficient grade. (F,SP)

152. Medieval Philosophy. (4) Three hours of lecture per week. (F)

153. Chinese Philosophy. (4) Three hours of lecture per week. The course focuses on certain central topics in Chinese philosophy, though a survey of the history of Chinese thought is also included. The topics emphasized vary from occasion to occasion, and may include: the Confucian ethical tradition; classical Chinese philosophy; a comparative study of Confucianism, Taoism and Buddhism. (F,SP)

154. 19th-Century Philosophy. (4) Three hours of lecture per week.

156. Foundations of Analytic Philosophy. (4) Three hours of lecture per week. Formerly 150-151. (SP) Sluga

160. Plato. (4) Three hours of lecture per week.

161. Aristotle. (4) Three hours of lecture per week.

163. Special Topics in Greek Philosophy. (4) Three hours of lecture per week. Prerequisites: 160 or 161 or equivalent. The course is designed to deal with a variety of topics in Greek philosophy. Its contents will vary from occasion to occasion. Possible topics include: the close study of one or more of Plato's dialogues, the reading of one of Aristotle's works, stoicism, scepticism, and neo-platonism.

167. Introduction to Chinese Philosophy. (4) Two 11/2 hours of lecture and one 1 hour discussion per week. A survey of the history of Chinese philosophy from late Chou times through the Ch'ing dynasty. Treated in some depth are a number of major Chinese thinkers including Confucius, Mencius, Hsun Tzu, Mo Tzu, Chuang Tzu, Tung Chung-shu, Chii Hsi, Wang Yang-ming, and Tai Chen. One of the major themes presented in the course is the development of Chinese ethical thought and the role of language in moral education. (Also listed as IDS 167 and Oriental Languages 167). (SP)

170. Descartes. (4) Three hours of lecture per week.


172. Spinoza. (4) Three hours of lecture per week.

173. Leibniz. (4) Three hours of lecture per week.

174. Locke. (4) Three hours of lecture per week.

175. Berkeley. (4) Three hours of lecture per week. (F)

176. Hume. (4) Three hours of lecture per week. (SP) Broughton

178. Kant. (4) Three hours of lecture per week. (F) Ginsborg

181. Hegel. (4) Three hours of lecture per week.

182. Kierkegaard. (4) Three hours of lecture per week. Prerequisites: One philosophy course. A study of Kierkegaard as theologian, psychologist, and philosopher with emphasis on those aspects of his thought which have provided the basis of existential phenomenology.

184. Nietzsche. (4) Three hours of lecture per week.

185. Special Topics in Modern Philosophy. (4) Three hours of lecture per week. The course is designed to deal with a variety of topics in modern philosophy. Its contents will vary from occasion to occasion. Possible topics include the detailed study of an important text by a modern philosopher, or the study of a particular period or movement of modern philosophy.


187. Hegelgger. (4) Three hours of lecture and one 1-hour section per week. A study of Hegel's Geist and Time. (F) Dreyfus

188. Wittgenstein. (4) Three hours of lecture per week. Sluga

189. Special Topics in Recent European Philosophy. (4) Three hours of lecture per week. The course is designed to deal with a variety of topics in recent European philosophy. Its contents will vary from occasion to occasion. Possible topics include: further work in phenomenology and existentialism, the study of a particular text by an important figure in contemporary European philosophy, current French and German philosophy. (SP) Dreyfus.

195. 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 prepare to satisfy the thesis requirement of the Honors Program. (F,SP)

196. Senior Colloquium. (4) Three hours of seminar per week. A seminar course for senior students in philosophy on a topic to be announced. Emphasis on the writing of papers and discussion of them. (F,SP)

198. Group Study. (1-4) Course may be repeated for credit. Tutorial. One 1/2-hour per weekly hour of instruction. 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. Tutor. One 1/2-hour per weekly hour of instruction. Prerequisites: Consent of instructor. Directed study on special topics. (F,SP)

200. First Year Graduate Seminar. (3) May be repeated for credit. Two 2-hour seminars per week. Must be taken on a satisfactory/unsatisfactory basis. A combination seminar and tutorial, required of and limited to first year graduate students in philosophy. (F)

204. Recent Work in Ethics. (3) May be repeated for credit. Two hours of seminar per week. Prerequisites: 104 or equivalent. Open to qualified upper-division undergraduates. (SP)

233. Recent Work in Philosophy of Language. (3) May be repeated for credit. Two hours of seminar per week.

234. Recent Work in Theory of Knowledge. (3) May be repeated for credit. Two hours of seminar per week.

237. Philosophical Problems. (3) May be repeated for credit. Two hours of seminar per week. Prerequisites: Graduate students who have not yet passed the Qualifying Examination.

250. Special Studies. (1-9) May be repeated for credit. Tutorial. Prerequisites: Consent of instructor. Open to qualified students wishing to pursue special study or research under the direction of a member of the staff. (F,SP)

290. Seminar. (3) May be repeated for credit. Two hours of seminar per week. Advanced study in various fields of philosophy. Topics will vary from semester to semester. (F,SP)

602. Individual Study for Doctoral Students. (1-9) May not be used for unit or residence requirements for the doctoral degree. May be repeated for credit. Independent study. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Reading or other advanced study by arrangement with a staff member, for preparation in advance of an examination for a higher degree. (F,SP)

Professional Courses

301. Professional Preparation: The Teaching of Philosophy. (2,4) May not be used for unit or residence requirements for the doctoral degree. May be repeated for credit. Independent study. 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)

Interdepartmental Studies Courses

Graduate Courses

*IDS 236. Cognitive Science Research Discussion. (1) Course may be repeated for credit. One 1 1/2-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Student must be the Cognitive Science R.A. for one of the professors associated with the Cognitive Science Program. The students will interchange on the Cognitive Science-related research that they are carrying on as R.A.'s with the aim of broadening both their experience and the scope of their group. In addition, they will discuss relevant selected readings. This course is required of all Cognitive Science R.A.'s. Sponsoring departments: Linguistics, Philosophy, and Psychology.

*IDS 237A-237B. Cognitive Science Seminar. (1;1) One 1 1/2-hour lecture and one 1 1/2-hour discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Weekly presentations by local and visiting researchers on a range of topics in Cognitive Science, with ensuing discussion. Sponsoring departments: Electrical Engineering and Computer Sciences, Linguistics, Philosophy and Psychology.

Physical Education

(College of Letters and Science)

Department Office: 200 Hearst Gymnasium, 642-3288
Chair: Roberta J. Park, Ph.D.

Professors:
George A. Brooks, Ph.D.
Helen M. Eckert, Ph.D.
Robert J. Parker, Ph.D.
Timothy P. White, Ph.D.
Mary Lou Norrie-Brown, Ph.D. (emeritus)
Anna S. Espenschade, Ph.D. (emeritus)
Franklin M. Henry, Ph.D. (emeritus)
B. Lawrence Radcl, Ph.D. (emeritus)
Deobold B. Van Dalen, Ph.D. (emeritus)

Associate Professors:
J. Brenda J. Bredmeyer, Ph.D.
Joseph Royce, Ph.D. (Emeritus)

Assistant Professor:
Steven L. Lehman, Ph.D.

Supervisors of Physical Education:
1. Francois Bolland, M.S.
2. C. Richard Crawford, M.A.
3. Peter C. Cooney, M.S.
4. Harold J. Frey, Ph.D. (Coordinator of Physical Activities at Hearst Gymnasium)
   Alvin R. Kyte, Ed.D.
   William Martell, M.S.
   Kyrie M. Mendel, M.S. (Edward Vincent)
   M. Kathryn Scott, M.A. (Vice Chair)
   Robert W. U. MacKenzie, M.A. (Emersum)
   Ralf Eckert, M.A. (Emeritus)
   Charles J. Keesey, A.B. (Emeritus)
   Chester W. Murphy, Ed.D. (Emeritus)
   Julius Paddy-Niao, M. Phys. ed., M.D. (Armes (Emeritus)

Lecturers:
1. S. Johannessen, M.A.
2. Ronald Larsen, M.S.
3. Susanne Li-Jue, M.A.
4. C. Edward McLaughlin, M.D.

Major Advisers: Ms. Brademeier, Mr. Brooks, Ms. Eckert, Mr. Lehrman, Mr. White.

Graduate Adviser: Ms. Park.

Pre-Major Adviser: Ms. Scott.

The Department of Physical Education at Berkeley offers an undergraduate A.B. major and graduate majors leading to the M.A. and Ph.D. degrees. In addition, the department makes available to all students a wide range of activities, organized and supervised by the physical education department.

The department operates an Exercise Stress Testing Laboratory for students and members of the University community who wish to utilize the service.

The physical education major is concerned with the wholeness of knowledge pertaining to an understanding of human beings as they engage in a wide range of motor activities. Emphasis is placed upon the development of a scientific and scholarly basis for understanding: (a) the physiological status of individuals engaged in physical activity; (b) acquisition, performance, and retention variables in motor activities; and (c) the nature and role of sports, dance, fitness, and gymnastics activities. The department operates an Exercise Stress Testing Laboratory for students and members of the University community who wish to utilize the service.

The physical education major is academic in its orientation, but can be broadened to accommodate the needs of each individual student. Students who have completed the undergraduate major in physical education will find that it has prepared them with a sound theoretical basis for entrance into advanced degree programs which emphasize research, as well as for entrance into such professional programs as physical therapy, sports medicine, cardiac rehabilitation, sports and recreation management, corporate fitness, teaching, and athletic training. The department does not offer formal programs in these professional fields, however.

For junior transfer students who plan to apply for admission in the area of biological science with a major in physical education, preparation should be as follows:

**Students who have completed 56 to 70 semester units:** Chemistry 1A and at least three of the following courses: (a) Anatomy 108-108L (or Chemistry 1A); (b) Biology 131-131L (or formerly Anatomy 108-108L) or equivalent; Elementary Statistics, Physics 8A, Molecular Biology 32 or (formerly Physiology 1-1L or formerly Integrative Biology 132-132L [formerly Physiology 109-109L] [human physiology with laboratory], and at least two of the following: Elementary Statistics, Physics 8A, Mathematics 16A, Psychology 135A, 135B, 140; Molecular and Cell Biology 32 or (formerly Physiology 1-1L or formerly Integrative Biology 132-132L [formerly Physiology 109-109L]) (human physiology with laboratory), and at least two of the following: Elementary Statistics, Physics 8A, Mathematics 16A, Psychology 135A, 135B, 140; Anthropology 3 or Sociology 1.

Courses accepted for the above requirements must be the equivalent of Berkeley campus courses.

**The Major**

**Lower Division:** Chemistry 1A; a course in elementary statistics; Molecular and Cell Biology 32 (formerly Physiology 1-1L) or Integrative Biology 132-132L (formerly Physiology 109-109L); Integrative Biology 131-131L (formerly Anatomy 108-108L); Physics 8A; Mathematics 16A; Psychology 1; History 5, 7B, 17A-17B or 30B; Anthropology 3 or Sociology 1.

**Upper Division:** Physical Education 101, 105A, 110, 111, 121, 130; 8 units from Physical Education 102, 105B, 107, 108, 112, 114, 119, 120, 135A, 135B, 140.

**Honors Program:** A student with an overall grade-point average of 3.5 or higher in courses in the major may, with the approval of the major adviser, apply for admission to the honors program. Requirements include an A grade in Comprehensive Examination which covers three sub-disciplines of Human Performance. Detailed information concerning honor classifications is available. Two hours of laboratory per week. Instruction in a variety of sports, exercise, and conditioning activities is offered at low 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. (FSP) Park, Staff.

**Graduate Degrees**

Graduate work leading to the M.A. and Ph.D. degrees is offered in the Department of Physical Education. Each is a research-oriented degree. The department does not offer professional degree programs. For the M.A. degree the student may choose either Plan II or Plan III. Plan II requires: (1) Historical and Social-Scientific Aspects of Human Motor Performance; (2) Motor Learning, Performance, and Development; (3) Physiological Aspects of Human Performance. Detailed information concerning admission, degree requirements, and graduate student instructor appointments is available upon request from the graduate secretary, 200 Hearst Gymnasium.

**Activities Instruction**

The department offers instructional classes to students in aquatics, sports, dance, fitness, combatives, and gymnastic activities. Instruction is planned to develop and improve performance skills, to impart knowledge and concepts relevant to the activity, to introduce information concerning the benefits of regular exercise, and to help students to develop and maintain physical fitness. Elementary through advanced level classes are provided in many activities. All classes are open to men and women for credit. Consult the Schedule of Classes each semester to determine the particular activities available. (FSP) Park, Staff.

**Departmental Fees:** The incidental fee payable by all students at the time of registration entitles students to use various gymnasia, swimming pools, tennis courts, and athletic fields. Lockers and shower facilities are provided. Some activity fees such as bowling and marital arts require payment of extra fees.

**Lockers Room Regulations and Penalties:** A penalty fine is imposed if students fail to comply with the following regulations: (a) clear lockers by specified date; (b) return equipment or clothing on or before the date posted for such return at the end of each semester or at the end of each special session of the University; (c) overtime use of locker in designated areas.

**Exercise Stress Testing:** As a service to the campus community the Department of Physical Education (in conjunction with the Student Health Service) offers a program of exercise stress testing and peak performance. Students may be directed to run on a treadmill or bicycle ergometer or be monitored. The determination of maximum oxygen consumption (VO max) is the best measure of physical fitness available. Participants are presented a computer generated evaluation of fitness status, as well as a program of exercise to maintain or improve physical fitness. This program is available to the University community on a fee basis. Inquiries should be directed to 103 Harmon Gymnasium.

**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 low 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. (FSP) Park, Staff.

2. **Physical Education Activities.** (.5) Course may be repeated for credit. Two hours of laboratory per week. Instruction in a variety of sports, exercise, and conditioning activities is offered at the low intermediate level. Students select section by activity and time preferences. Students should consult the Schedule of Classes each semester to determine the particular activities available. (FSP) Park, 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 low 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. (FSP) Park, 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 low 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. (FSP) Park, 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 low 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. (FSP) Park, 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. (FSP) Staff.

7. **Physical Education Activities.** (.5) Course may be repeated for credit. Two hours of laboratory per week. Variety of intercollegiate team 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. (FSP) Staff.
9. Physical Education Activities for Majors. (1) Course may be repeated for credit. Four hours of laboratory per week. Sections in sport, exercise, and dance for physical education majors. (F,SP) Scott

32. Fitness for Life: Physiological Adaptations to Exercise. (2) One hour of lecture and three hours of laboratory per week: Limited to Freshmen and Sophomores. Introduction to the body's major systems (i.e., cardiorespiratory, musculoskeletal, neuro-muscular, etc.) Specific adaptations of these systems in response to different exercise regimens will be examined. Environmental, nutritional and aging influences on performance will also be discussed. Exercise programs designed to enhance endurance, speed, balance and strength will be examined. The lab will provide students with actual opportunities to participate in the assessment of fitness. (SP) Johannessen

39. Healthy, Moral and Strong: Athleticism in the 19th Century. (3) Two 1/2-hour meetings per week. Nineteenth century American and European views of bodily fitness, exercise, and athletics. The rise of "modern" sport. Medicine, biology and Victorian notions of health and exercise. Physical education and sport as perceived means to moral and physical regeneration and the establishment of a well-ordered society. (F) Park

50. Emergency First Aid and Sports Related Injuries. (2) One 1/2-hour lecture and one two-hour laboratory per week. Must be taken on a passed/not passed basis. Intensive course in First Aid. Upon successful completion of the course and the additional requirements of the American Red Cross, an appropriate certificate may be issued. (F) Park

69. Descriptive Introduction to Physical Education. (2) Two hours of lecture per week. Prerequisites: High school biology or equivalent. Physical structure and muscular movements in relation to the body as a whole. Emphasis on exercise and recreation with reference to the immediate and more lasting effects of physical activity on the human body including: growth and development, factors affecting motor learning, socio-psychological aspects of sports participation, and philosophical and historical considerations of sports. (SP) Scott

99. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Three to twelve hours of tutorial (or field research) per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Individual independent study and research by lower division students. Limited to freshmen and sophomores. (F,SP) Park

Upper Division Courses

101. Kinesiology and Body Mechanics. (3) Two hours of lecture and one 3-hour laboratory per week. Prerequisites: College level courses in human anatomy with lab, in human physiology with lab; Physics 10 (or 8A recommended). Physical structure and muscular movements in various physical activities. Anatomico-physiological concepts and physical laws related to joint and muscle action. (F)

102. Kinesiology of the Handicapped. (2) Two hours lecture per week. Prerequisites: 101. Causes, incidence, physical, psychological, social, and philosophical considerations of motor participation in society. Current research and nature of programs designed to lead to optimum function of the handicapped. (SP)

105A. Exercise Physiology. (4) Three hours lecture and one three-hour lab per week. Prerequisites: A college level course in zoology with lab or General Chemistry 1A. Discussions of how chemical energy is captured within cells, and how potential chemical energy is converted to muscular work. Energetics, direct and indirect calorigraphy, pathways of passage of factors in exercise, ventilation, circulation, skeletal muscle fiber types. (F) Brooks

105B. Exercise Physiology. (4) Three hours of lecture and one 3-hour laboratory per week. Prerequisites: 105A. Discussions of the effect of exercise on skeletal muscle, exercise and cardiovascular disease, the interaction in the heat, cold, under water, and at altitude, nutrition and performance, effects of drugs on performance, blood doping, sex differences and performance. (SP) Brooks

107. Sports Medicine. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 105A or equivalent. An introduction to the mechanisms of injuries in physical activities: strategies in the prevention, recognition, evaluation, management and rehabilitation of sports related injuries. (SP) McLaughlin

108. Neuromuscular Fatigue. (2) Two hours of lecture per week. Prerequisites: Human Physiology or equivalent. Physiology of motor nerve, muscle excitation and muscle contraction, and changes occurring during fatigue and recovery. (F) Lehman

110. Motor Control. (3) Two hours of lecture and two hours of laboratory per week. Control of normal human movement with an emphasis on the physical mechanisms: Structure and mechanical properties of muscle, function of proprioceptors, sensory and motor pathways and areas in the central nervous system, and sensorimotor integration in control of posture, locomotion and simple voluntary movement. (SP) Lehman

111. Motor Development. (3) Three hours of lecture per week. Prerequisites: Psychology 1 and elementary statistics. Motor development from birth to maturity, age changes, sex and individual differences, maturational, motor learning in childhood adolescence, and relation of motor performance to other aspects of behavior. (F) Eckert

112. Motor Development of the Handicapped. (2) Two hours of lecture per week. Prerequisites: 111. Motor development of the handicapped as a function of age, sex, and type of disability. Influence of maturation and environmental factors on motor development according to the type of handicapping condition. (SP) Eckert

114. Psychological Bases of Human Movement. (2) Two hours of lecture per week. Prerequisites: Psychology 1. The focus of this course will be on selected psychological and social psychological factors relevant to physical activity experience. Specifically, we will explore how certain human qualities influence the performance and experience of physical activity participants, and how participation may affect the psychological make-up of individuals. (F) Bredemeier

119. Exercise and Aging. (3) 2 hours lecture and 1 hour discussion per week. Prerequisites: Molecular and Cell Biology 32; Psychology 1. Functional capacity changes during aging. Exercise, physical performance, and the aging process. The role of exercise and physical activity in the maintenance of healthy lifestyles for older adults: physiological, morphological, developmental, psycho-social, and cultural considerations. (SP) Eckert

120. Sports in American Society. (2) Two hours of lecture per week. Prerequisites: Sociology 1. Interrelationships of sports and physical recreation with other aspects of American culture. Emphasis on the twentieth century. (F) Bredemeier

121. Social-Cultural Bases of Human Movement. (3) Two hours of lecture and one hour of section 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, processes, and systems are examined in relation to sport and social groups as subcultures. (F) Bredemeier

130. History of Physical Education and Sport. (3) Two hours of lecture and one hour of section per week. Prerequisites: History 5, 75, 17A-17B or 30. Historical overview of physical education and sport in cultural, social, and pertinent scientific aspects. Emphasis on 17th through early 20th centuries. (F) Park

131. Curriculum Development and Administration. (2) Two hours of lecture per week. Prerequisites: 111 and 130. Curriculum development and evaluation in school and college programs of physical education in- cluding instructional programs, interscholastic sports and intramural activities, and intercollegiate sports and interscholastic athletics. Administrative policies and procedure pertaining to staff, facilities, equipment, budget and program. (F) Kyte

135A. Measurement and Evaluation in Physical Education. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: Elementary statistics. Evaluation in physical education. Measurement of physical abilities and specialized motor skills. (SP) Eckert

135B. Measurement and Evaluation in Physical Education. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: 135A. Advanced topics in the measurement and evaluation of human motor performance. Eckert

140. Recreation in American Society. (2) One and one-half hours of lecture and one hour of section per week. Prerequisites: Sociology 1 or Anthropology 3. Nature, scope and significance of recreation in the social and economic life of the American people. (SP)

150. Theory of Dance. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Activity class sections in dance and either Sociology 1 or Anthropology 3. Ethnic, social, and contemporary dance forms: development in Europe and the Americas; present trends in the United States; nature and function of rhythm in dance; theories and principles of technique and composition. Bioland, Li-Jue

165. Introduction to the Biomechanical Analysis of Human Movement. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 9 and 101. Basic biomechanical and anatomical concepts of human movement and their application to fundamental movement patterns, exercise, and sport skills. (F) Scott

171. Conditioning for Exercise and Sports, and Care of Sports Injuries. (2) One hour of lecture and two hours of laboratory. Prerequisites: Pre-Preliminary Molecu- lar Cell Biology 32 & 32L; Integrative Biology 131 & 131L (or equivalents), current American Red Cross first aid certificate. Conditioning for exercise, sports, and athletics: sleep, diet, health, and physical activity habits. Regiments of preventing sports injuries. Care of injuries with special emphasis on taping, therapy, protective equipment. (SP) Park

195. Honors Course. (2-4) Course may be repeated for credit. Individual conferences to be arranged. Must be taken on a passed/not passed basis. Supervised experience relevant to specific aspects of physical education, sport and fitness. Regular individual meetings with faculty sponsor and written reports required. (F,SP) Park, Staff

196. Honors Thesis. (2) Course may be repeated for credit. Individual conferences to be arranged. (F,SP) Park, Staff

197. Field Study in Physical Education. (1-3) Course may be repeated for credit. Individual conferences to be arranged. Must be taken on a passed/not passed basis. Supervised experience relevant to specific aspects of physical education, sport and fitness. Regular individual meetings with faculty sponsor and written reports required. (F,SP) Park, Scott

199. Supervised Independent Study and Research for Undergraduates. (1-3) Course may be repeated for credit. Individual conferences to be arranged. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations listed on pages 91-92 of the General Catalog. (F,SP) Park, Staff

Graduate Courses

200. Seminar in Physical Education. (2) Two hours of class per week. Critical review of literature and research methods. (F)

201. Seminar in Kinesiology and Body Mechanics. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 101. Neurophysio- logical concepts, physical laws and kinesiology.

205. Seminar in Physiological Bases of Physical Activity. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 105A. Immediate and long-range adaptations of the body to ex-
208. Seminar in Neuromuscular Fatigue. (2) Course may be repeated for credit. Two hours of seminar per week. Critical review of current literature on neuromotor control. (F) Lehman

210. Seminar in Motor Control. (2) Two hours of seminar per week. Prerequisites; 110. The control of normal human movements, with emphasis on physiological mechanisms: structure and mechanical properties of muscle, anatomy and function of proprioceptors, spinal pattern generation and reflexes, motor systems of the brain. Synthesis of these mechanisms in relation to hierarchical and voluntary movements. Critical review of current literature in motor control. (SP) Lehman

211. Seminar in Motor Development. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 111. Contemporary theories of development. Changing motor abilities and behavior from childhood through youth and age. (SP) Eckert

212. Seminar in Motor Development of the Handicapped. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 112. Special problems in the motor development of the handicapped with reference to type of disability, maturational level, sex, and environmental factors. (F,SP) Lehman

214. Seminar: Psychological Bases of Human Movement. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 114. Critical review of current literature on selected sociopsychological constructs pertinent to physical activity experiences. (SP) Bredemeier

221A. Seminar in Sociocultural Bases of Play, Games, and Sport. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 120 or 121. Critical review of current literature on the social importance and structure, variety, and extent of sport in modern societies. (SP) Bredemeier

221B. Seminar in Sociocultural Bases of Play, Games, and Sport. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 120 or 121. Historical analyses of physical education and sport in various societies. Emphasis on Western Europe and the United States. (SP) Bredemeier

221. The Management and Administration of Sports and Physical Education. (2) Two hours of seminar per week. Prerequisites: 121 or 130. Theories, styles, policies, and practices relative to the planning and administration of physical education, exercise, sports, and athletic programs and organizations. (SP) Park

230. Research. (2-12) Course may be repeated for credit. Hours to be arranged. (F,SP) Park, Staff

235. Department Seminar. Course may be repeated for credit. One hour of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Preparation of research and lectures by graduate students. (F,SP) Scott

231. The Management and Administration of Sports and Physical Education. (2) Two hours of seminar per week. Prerequisites: 121 or 130. Theories, styles, policies, and practices relative to the planning and administration of physical education, exercise, sports, and athletic programs and organizations. (SP) Park

240. Research. (2-12) Course may be repeated for credit. Hours to be arranged. (F,SP) Park, Staff

260. Teaching in Laboratory/Discussion Sections. Course may be repeated for credit. Hours to be arranged. Open only to qualified graduate students. (F,SP)

600A. History of Physical Education and Sport. (1-8) Park

600B. Kinesiology. (1-6)

600C. Motor Development. (1-6) Eckert

600D. Exercise Physiology. (1-6) Brooks

600E. Psychological Bases of Physical Activity. (1-6) Bredemeier

600F. Socio-Cultural Bases of Physical Activity. (1-6) Park

600G. Motor Control. (1-6) Course may be repeated for credit. Park

601. Individual Study for Master’s Students. (3-12) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Individual study to prepare for master’s comprehensive examination. Units may not be used to meet either unit or residency requirements for the master’s degree. (F,SP) Park, Staff

602. Individual Study for Doctoral Students. (3-12) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with major field advisor to prepare for doctoral examinations. May not be used for unit or residency requirements for the doctoral degree. (F,SP) Park, Staff

605. Training in Research Methods in Physical Education. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Experiences in methods appropriate to the conduct of research in various areas of the field of physical education. Students may only enroll in an area corresponding to his/her area of emphasis in graduate study, and when such experiences clearly contribute to the attainment of the student’s academic objectives. Units may not be used for unit or residency requirements for a master’s degree. (F,SP) Park, Staff

Professional Courses

300. Problems and Methods in Teaching Physical Education. (2) One hour of lecture and three hours laboratory per week. Prerequisites: 9, 165, 101 or 105A. Course to include the problems involved with physical activities in schools, community agencies, and private organizations. (SP) Scott

305. Methods of Teaching Physical Education Activities. (2) One and one-half hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Intensive course for graduate student teaching at the college level. Various dimensions of teaching physical activity classes at the college level. Course to include philosophies and competencies as well as methods of transmitting content and evaluation. Required for all new graduate students holding associate appointments in the physical education activity program. (F) Scott

320. Sport Management and Administration. (2) One hour of lecture and three hours of laboratory per week. Prerequisites: 114, 120 or 121, or 140. The management of intercollegiate and intramural athletic, professional sports, corporate fitness, and related exercise and recreational programs: psychosocial, health; personnel, technical, and business considerations. (F)

403. Exercise Stress Testing Techniques. (1-3) Course may be repeated for credit. One 3-hour laboratory and one 1-hour discussion per week. Prerequisites: 105A or consent of instructor. Theory and practice of exercise stress testing and prescription. Techniques include: pulmonary function testing, body composition and analysis, recording of ECG, determination of blood pressure, treadmill and bicycle ergometer testing, maximal oxygen consumption determination, data interpretation and exercise prescription. (F,SP) Johannessen

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall

Physical Science

(Stated Letters and Science)

Major Adviser: (To be announced), 370 LeConte Hall, 642-0481.

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 is based on Physics 8, which is required of life sciences students, and Mathematics 16, which is required in part by life sciences departments. Through this plan a student preparing for a career in environmental or health science may 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, 51 or 55; Physics 8A-8B; Chemistry 1A-1B; Computer Science 8.

Upper Division Courses. Physics 132; Chemistry 130A-130B; Physiological Optics 110; Statistics 131A. Electives in physical sciences, mathematics and statistics, with the approval of the adviser to complete a total of 30 upper-division units in the major. Up to 8 upper-division units in engineering and/or computer science will be accepted with the approval of the adviser.

Plan B

(Option of departmental concentration)

Lower Division Courses. Mathematics 1A-1B, 50A-50B; Physics 7A-7B-7C; Chemistry 1A-1B or 4A-4B; recommended Chemistry 14.

Additional Required Courses. Geology 50/50L or Geology 100A or Astronomy 7 or 127A.

Upper Division Courses. Two of the three courses Physics 105, 110A, or 137, Chemistry 120A or (for students well-enough prepared) 104A. Electives in physical sciences, mathematics and statistics, with the approval of the adviser to complete a total of 24 upper-division units. Up to 8 upper-division units in engineering and/or computer science will be accepted with approval of the adviser.

Honors Program. Students with a grade-point average both 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 include two semesters of work in a departmental 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 Act of 1970. Prospective single subject teachers in physical science are encouraged to complete the field major in the 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.

*On leave, spring
*Recalled to active service
*Recipient of Distinguished Teaching Award
Physics
(College of Letters and Science)

Department Office: 366 LeConte Hall, 642-7166
Chair: Buford Price, Ph.D., D.Sc.

University Professors:

Arthur H. Rosenfeld, Ph.D. University of Chicago, D.Sc.
Alan M. Portis, Ph.D. University of California at Berkeley.
Paul L. Richards, Ph.D. University of California at Berkeley.
Ronald R. Ross, Ph.D. University of California at Berkeley.
Richard A. Muller, Ph.D. University of California at Berkeley.
Sitanley Mandelstam, Ph.D. University of Chicago, theory of temperature physics.
Robert P. Lin, Ph.D. University of California at Berkeley.
Robert G. Littlejohn, Ph.D. University of California at Berkeley.
Robert P. Ely, Ph.D. Massachusetts Institute of Technology.
Marc Davis, Ph.D. Princeton University, astrophysics.
Kenneth M. Crowe, Ph.D. University of California at Berkeley.
Frank S. Crawford, Ph.D. University of California at Berkeley.
George H. Trilling, Ph.D. California Institute of Technology.
Marc Davis, Ph.D. Princeton University, astrophysics.

Theory of Elementary Particles:

- Robert D. Tripp, Ph.D. University of California at Berkeley.
- Richard H. Wicke, Ph.D. Columbia University.
- Howard A. Strobridge, Ph.D. University of California at Berkeley.
- Peter Y. Uf, Ph.D. Brown University, experimental condensed matter physics.
- Alex Zei, Ph.D. University of California at Los Angeles.

Condensed Matter Physics:

- Bruno Zumino, Ph.D. University of Rome, theory of elementary particles.
- Owen Chamberlain, Ph.D. (Emeritus).
- William B. Fetter, Ph.D. University of California at Berkeley.
- Charles Kittel, Ph.D. (Emeritus).
- John H. Reynolds, Ph.D. University of Chicago, Dr.h.c. (Emeritus).

Associates Professors:

- Roger W. Falcone, Ph.D. Stanford University.
- Quantum electronics and atomic physics.
- James L. LeCron, Ph.D. Stanford University.

Senior Lecturers:

- David L. Judge, Ph.D. California Institute of Technology.
- D.Sc. Classical dynamics, fusion, particle accelerators and beams.

The Major

The physics major is designed to give the student a broad and thorough understanding of the fundamentals of physics. The emphasis is, therefore, on general understanding rather than on specialized skills; although some specialized courses are among the options, they are not intended to substitute for that kind of instruction. Students considering a physics major are urged to consult a departmental adviser, in order to discuss the content of the major and also the opportunities after graduation. Recent graduates have entered graduate study in a number of scientific fields such as biophysics and geophysics as well as in physics, and others have gone on to jobs in academic, industrial and government laboratories. Students who are considering high school teaching as a career are especially urged to consult with their adviser early.

Lower Division Courses.

Physics 7A-7B-7C (regular or honors) are required for students in physics, mathematics, and electrical engineering courses. These courses must be taken for a letter grade (thus Physics 12A, 12B, 12C is not acceptable). The students must achieve a minimum GPA of 3.0 in the seven courses.

Minor Requirements.

Physics 137A; 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 (thus Physics 12A, 12B, 12C, 198, 199 will not count toward the minor program). A minimum of three upper division courses must be completed at Berkeley. An overall minimum GPA of 2.0 is required for all upper division courses applied to the minor program.

Students who have completed the requirements for the minor will be required to furnish transcripts (official or unofficial) to the undergraduate assistant (in 366 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 366 Le Conte Hall) the student 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 completed until the student graduates from the College of Letters and Science.

For more information regarding this program please contact the undergraduate assistant at 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 must submit satisfactory grades in the graduate record examination in physics. Detailed information concerning admission, graduate student instructor appointments, fellowships, and degree requirements is given in a departmental brochure 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. Campus research includes atomic physics and spectroscopy, astrophysics, cosmic rays, mass spectrometry, nonlinear optics, solid state physics, low-temperature physics, electron and nuclear magnetic resonance, gasdynamics, electronics, and upper atmospheric physics. At the Lawrence Berkeley Laboratory, extensive opportunities exist for research in elementary particle and nuclear physics, in plasma physics, and on energy and environmental problems. Space physics, interplanetary studies, solar plasma research, physics of the upper atmosphere, and cosmological problems are pursued both in the Physics Department and in the Space Sciences Laboratories. Students with special research interests should make inquiry in the department office.

Requirements for the Ph.D. include the following courses: Physics 210A-210B and 221A-221B 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 200 courses. Some of the 19 units could include courses in mathematics, bio- physics, or astrophysics. Mathematics 224 is recommended. Physics 251, 290, 295, 299, 300, and 602 are excluded from the 19 units considered above. In physics, the M.A. degree requires 30 semester units of upper division and graduate courses followed by a comprehensive final examination administered by the Physics Department. At least 18 units must be in graduate courses in the major subject.

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 planning to enter the College of Chemistry or the College of Engineering. Students proceeding with a second-year mathematics sequence should take courses 50A-50B concurrently with Physics 7B-7C, respectively. Physics 8A-8B are designed for premedical 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 lecture, one hour discussion, and three hours 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 lecture, one hour discussion, and three hours laboratory per week. Prerequisites: 7A, Math 1A-1B, Math 50A (may be taken concurrently). Heat, electricity, and magnetism. (F,SP) Staff

7C. Physics for Scientists and Engineers. (4) Three hours lecture, one hour discussion, and three hours laboratory per week. Prerequisites: 7A, Math 1A-1B, Math 50A-50B (Math 50B may be taken concurrently). Basic principles of physics, optics, relativity, and quantum physics. (F,SP) Staff

H7A-H7C. Physics for Scientists and Engineers. (4;4;4) Three hours lecture, one hour discussion, and three hours laboratory per week. Prerequisites: High School Physics; Math 1A-1B, Math 50A-50B (may be taken concurrently). Mechanics, wave motion, electricity, and magnetism. (F,SP) Staff

8A. Introductory Physics. (4) Students with credit for 7A will not receive credit for 8A. Three hours lecture and one hour discussion per week plus ten 3-hour laboratories 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 series 8A-8B. (F,SP) Staff

8B. Introductory Physics. (4) Students with credit for 7B or 7C will not receive credit for Physics 8B. Three hours lecture and one hour discussion per week plus ten 3-hour laboratories per semester. Prerequisites: 8A or equivalent. Electromagnetism, optics and modern physics. (F,SP) Staff

10. Descriptive Introduction to Physics. (3) Not open to students who have taken any of 7A-7B-7C, 101A-101B, 137A-137B (137B may be taken concurrently). Three hours lecture and one hour 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 lecture and one hour discussion per week. Prerequisites: No previous courses in Physics are assumed, although Physics 10 is recommended. Physical principles encountered in the study of music. The applicable laws of mechanics, fundamentals of sound, harmonic content, principles of sound production in musical instruments, musical scales. Numerous illustrative lecture demonstrations will be given. Only the basics of high school algebra and geometry will be used.

39. Lower Division Physics Seminars. (1.5) Course may be repeated for credit. Two hours of lecture per week. Must be taken on a passed/not passed basis. Prerequisites: Enrollment by consent of instructor during the week of pre-enrollment. Consult bulletin board outside of 366 Le Conte for more information. Enrollment limited to 20 students per section. Physics Seminar course designed for both non-major students and those 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 to be 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

105. Analytic Mechanics. (4) Three hours lecture and one hour discussion per week. Newtonian mechanics, motion of a particle in one, two, and three dimensions, central force motion, moving coordinate systems, mechanics of continuous media, oscillations, normal modes, Lagrange's equations, rigid body dynamics, linear and angular oscillations. (F,SP) Staff

110A-110B. Electromagnetism and Optics. (4;4) Three hours lecture and one hour discussion per week. A course emphasizing electromagnetic theory and applications; charges and currents; electric and magnetic fields; dielectric, conducting, and magnetic media; relativistic, Maxwell equations. Wave propagation in media, radiation and scattering, Fourier optics, transmission, refraction and diffraction, ray optics and applications. (F,SP) Staff

111. Modern Physics and Advanced Electrical Laboratory. (1-3) Five units required for physics major; eight units may be taken for credit. More than 3 units may be completed in one semester. Two 4-hour laboratory sessions per week, minutes to be arranged. Consent of instructor. The course will begin with a seminar (8 hours/week) and laboratory and lecture on Basic Semiconductor Circuits (BSC(Sup)) for 2 units, followed by an individual experimental project on approximately 0.5 units each. This advanced laboratory for junior and senior students involves some of the significant experiments of atomic, nuclear, classical, and solid-state physics. Individual work is encouraged. (F,SP) Staff

112. Introduction to Statistical and Thermal Physics. (4) Three hours lecture and one hour discussion per week. Basic concepts of statistical mechanics, microscopic basis of thermodynamics and applications to macroscopic systems. Statistical states, phase transformations, quantum distributions, elementary kinetic theory of transport processes, fluctuation phenomena. (F,SP) Staff

123. Computational Physics. (2) Three hours seminar and three hours laboratory per week. Must be taken on a passed/not passed basis. Prerequisites: Working knowledge of at least one of the following computer languages: Basic, Fortran, Pascal, or C. Senior standing in the Physics major or related discipline.

124. Introductory Nuclear Physics. (3) Three hours lecture and one hour discussion per week. Prerequisites: 137A. Tools of nuclear physics, alpha, beta, and gamma decay, nuclear interactions and structure, brief introduction to particle physics. (F,SP) Staff

129A-129B. Particle Physics. (4;4) Three hours lecture and one hour 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 studied by quantum field theory. Lab. 129A will study the field including some related topics in nuclear physics. 129B will develop more quantitatively such topics as quantum number determination of resonances and decay processes. (F,SP) Staff

132. Contemporary Physics. (3) Not open for credit to students who have completed 137A. Three hours lecture and one hour discussion per week. Prerequisites: 8A-8B or equivalent or consent of instructor. A general descriptive course of selected topics in contemporary physics. Subject matter will vary and may include topics from special and general relativity, quantum mechanics, elementary particle physics, fundamental particles and their symmetries, superconductivity and superfluidity, solid state physics, astrophysics, and cosmology. (SP) Staff

137A-137B. Quantum Mechanics. (4;4) Three hours lecture and one hour discussion per week. Introduction to quantum mechanics with applications to atomic, molecular, solid state, nuclear and elementary particle physics. (F,SP) Staff

138. Modern Atomic Physics. (3) Three hours lecture and one hour discussion per week. Prerequisites: 137A-137B. Course goals: 1. The description and calculation of the properties of atomic energy levels based on the central field approximation. The ideas developed in this description are widely used in solid state, particle and nuclear physics. 2. The description of modern experimental
methods in atomic and physical science and some of the important physics obtained from them. Examples are atomic resonance, lasers and masers, ion and neutral atom traps, optical pumping and beam foil spectroscopy. (F) Marrus

139. Special Relativity and General Relativity. (3) Three hours lecture and one hour discussion per week. Prerequisites: MAT 010 or consent of instructor. Historical and experimental foundations of Einstein's special theory of relativity; spatial and temporal measurements, particle dynamics, electrodynamics, Lorentz invariance, 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 and their bonding; electromagnetic, elastic, and particle waves in periodic lattices; thermal magnetic and dielectric properties of solids; energy bands of metals and semiconductors; superconductivity; magnetism; ferroelectricity; magnetic resonances. (F,SP) Staff

142. Introduction to Plasma Physics. (4) Three hours lecture and one hour discussion per week. Prerequisites: 112 or 112B or 112C or equivalent. Motion of charged particles in electric and magnetic fields, dynamics of fully ionized plasma from both microscopic and macroscopic point of view, magnetohydrodynamics, small amplitude waves; aspects from astrophysics, space sciences and controlled-fusion research. (SP) Staff

150. Introduction to Atmospheric and Space Sciences. (3) Three hours lecture and one hour discussion per week. Prerequisites: Senior standing in the physical sciences or consent of instructor. Recent measurements and physical theories of processes in the solar system, galaxy, and universe resulting from the interactions of particles, fields, radiation and matter. (F) Staff

153. Physics in the American System. (1) One and one-half hours of lecture per week plus optional section meetings. Must be taken on a passed/not passed basis. Prerequisites: Introductory course in physical science or consent of instructor. A critical study of the political, economic, and social forces that influence the work of physicists and scientists generally. (F) Staff

180. Physics of Energy Conversion and Use. (3) Three hours lecture and one hour discussion per week. Prerequisites: 112 or equivalent, or consent of instructor. Thermal and electrical conversion of solar, chemical, nuclear, geothermal, hydro and wind energy; properties of solids; electrical properties of energy conversion materials. Physics and thermodynamics of the efficient use of energy. (SP) Staff

H190. Physics Honors Course. (2) Course may be repeated for credit. Must be taken on a passed/not passed basis. A seminar which includes study and reports on current theoretical and experimental problems. Open to all students. (F,SP) Staff

H195A-H195B. Senior Honors Thesis Research. (2,2) Credit and grade to be awarded upon completion of the sequence. Prerequisites: Open only to students in the honors program. Directed individual research, with 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

198. Directed Group Study. (1-4) Must be taken on a passed/not passed basis. Enrollment is restricted by regulations governing 198 courses. See section on Course Listings on pages 91-92 of the General Catalog. (F,SP) Staff

199. Supervised Independent Study. (1-3) Must be taken on a passed/not passed basis. Enrollment is restricted by regulations governing 199 courses. See section on Course Listings on pages 91-92 of the General Catalog. (F,SP) Staff

Graduate Courses-

205A. Advanced Dynamics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 105 or equivalent. Variational methods, stability, kinematics and dynamics of rotation, canonical variables and transformations, perturbation theory, non-linear dynamics, KAM theory. (F) Staff

205B. Advanced Dynamics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 205A. Continuous 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: 110A-110B and 137A-137B. 210A, 210A, or their equivalents are recommended. semiclassical theories of emission and absorption, theory and operation of common laser systems, wave propagation in anisotropic and nonlinear media, nonlinear optical phenomena such as second harmonic generation and parameter amplification. (F) Staff

208B. Introduction to Quantum Electronics and Nonlinear Optics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 208A or equivalent. Basic concepts and applications included are: quantum mechanics, quantum electrodynamics. Topics selected from recent contributions. (F,SP) Staff

210A. Theory of Electricity and Magnetism. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 110A-110B or equivalent. Methods of mathematical physics with emphasis on electricity and magnetism. General study of partial differential equations, special functions, Green's functions, complex variable methods, approximation methods. (F) Staff

210B. Theory of Electricity and Magnetism. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 210A. Maxwell's equations, relativity, radiation, diffraction, interactions of radiation with matter. (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. Techniques of interacting systems. Particle (F) Staff

212. Nonequilibrium Statistical Physics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 211A and 221A, or equivalent. Time dependent processes, non-equilibrium systems. Transport processes. Irreversibility. Theory of many-particle systems. Fluctuation phenomena. (SP) Staff

216. Special Topics in Many-Body Physics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 221A-221B or equivalent. Recommended. Quantum theory of many-particle systems. Applications of theory and technique to physical systems. Pairing phenomena, superfluidity, equation of state, critical phenomena, phase transitions, nuclear matter. (F) 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; Schrodinger 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. Many-body methods, radiation field quantization, relativistic quantum mechanics, applications. (SP) Staff

222. Special Topics in Mathematical Physics. (2-4) May be repeated for credit with consent of instructor. Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Application of a branch of mathematical physics to physical problems. Topics to be announced by the department. Particular attention will be given to recent developments in methods and to the unifying mathematical ideas. (SP) Staff

223. Group Theory and Quantum Mechanics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 221A-221B or consent of instructor. Introduction to theory of groups and group representations; brief survey of quantum mechanics of atoms, molecules, and solids, emphasizing applications of group theoretical methods. (SP) Staff

225A-225B. Relativistic Particle Physics. (5,5) Three hours of lecture and one hour of discussion per week. Prerequisites: 221A-221B or equivalent. 225A is a prerequisite to 225B. Feynman diagram calculation including many examples such as Compton, Moller, and Bhabha scattering. Higher order diagrams and renormalization. Renormalization group. Consequences of charge conjugation, parity reflection, and time reversal. Isospin invariance, SU(3), and scalar quark model SU(6). Gauge symmetries of colors and flavors. Spontaneous breaking of symmetries. Parton model and perturbative quantum chromodynamics. (F) Staff

229. Theory of Weak Interactions. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 225A or consent of instructor. Phenomenological theory of weak interactions. Introduction to four-fermion interaction. Decays of leptons and hadrons. Neutrino scattering at high energies. Unified gauge models of weak and electromagnetic interactions, in particular, Glashow-Salam-Weinberg model and its experimental verification. Grand unified models of electroweak and strong interactions. (F) Staff

230A-230B. Quantum Theory of Fields and Particles. (4,4) Three hours of lecture and one hour of discussion per week. Prerequisites: 221A-221B and 225A or equivalent. 221B may be taken concurrently. 225A is prerequisite to 230B. Relativistic quantum mechanics of fields and particles. Lorentz invariance, S matrix, perturbation expansion, renormalizations, and quark models. Quantum electrodynamics. Recent developments in field theory such as functional integral formalism, nonabelian gauge fields, renormalization group, and axiomatic and constructive field theories. (F) Staff

231. General Relativity. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 210A or equivalent, or consent of instructor. An introduction to Einstein's theory of gravitation. Tensor analysis, general relativistic models for matter and electromagnetism, Einstein's field equations. Applications, for example, to the solar system, dense stars, black holes, and cosmology. (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 equivalents, 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 spherical symmetries; Impurity states; transport processes; Fermi-Dirac statistics and perturbation scattering; nonclassical effects; theoretical methods in magnetic resonance. (F) Staff

242A-242B. Theoretical Plasma Physics. (4,4) Three hours of lecture and one hour of discussion per week. Prerequisites: 225A or equivalent, or consent of instructor; 242A is prerequisite to 242B. Applications of plasma theory to the understanding of partially ionized plasmas, including electron recombination, radiation and transport phenomena, plasma production and decay. Application to atmospheric and...
astrophysical sciences, high speed gas dynamics, and electric discharges. (F) Staff

250. Special Topics in Physics. (2-4) 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) Formerly 251A-251B. One 1-hour lecture and one 1-hour discussion section per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Department of Physics 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

252. Issues in the Teaching of Physics. (2) One 2-hour lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Senior or Graduate standing in Physics or consent of instructor. Discussion of issues and recent developments important for the teaching of physics. Especially highly recommended for all graduate student instructors, and students without prior teaching experience, to prepare them for their physics teaching activities in graduate school and subsequent careers.

290. Seminar. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. 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

*290C. Experimental Cosmology. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. (F)

290J. Seminar. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. (F)

290L. Seminar. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. (F)

290N. Seminar in Non-Neutral Plasmas. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. (F)

*290P. Seminar. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. (F)

290Q. Seminar in Quantum Optics. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. (F)

285. Research. (1-12) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. This course is arranged to allow qualified graduate students to investigate possible research fields or to pursue problems of interest through reading or non-laboratory study under the direction of faculty members who agree to give such supervision. (F,SP) Staff

299. Special Study for Graduate Students. (1-4) Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. This course is arranged to allow qualified graduate students to investigate possible research fields or to pursue problems of interest through reading or non-laboratory study under the direction of faculty members who agree to give such supervision. (F,SP) Staff

702. Individual Study for Doctoral Students. (1-8) May not be used for unit or residence requirements for the doctoral degree. May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. For qualified graduate students. Individual study in consultation with the major field advisor, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (F,SP) Staff

Professional Courses

300. Professional Preparation: Supervised Teaching of Physics. (2) May be repeated for credit. One hour of supervised teaching 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) Shagam

Interdepartmental Studies Courses

Lower Division Course

IDS 80. Environmental Physics. (3) Three hours of lecture and one hour of discussion per week. Elementary concepts of physics with application to problems of environment, pollution, energy, geology. Specific examples of the role of physics in contemporary social issues. Sponsoring departments: Conservation and Resource Studies and Physics. (F)

Upper Division Course

*IDS 173. Technology, Doctrine and Politics of the Nuclear Arms Race. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Upper division standing or consent of instructor. This survey course will examine the interaction of technological innovation, strategic planning, and political processes to understand the dynamics of the nuclear arms race. The course will provide intensive introduction to the literature and history of the subject and will be structured critically to help in understanding contemporary challenges and the possibilities of future developments. Sponsoring departments: Physics and Peace and Conflict Studies.

Graduate Courses


*IDS 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 the astrophysical environment. Cosmic ray production and propagation. Applications selected from pulsars, x-ray sources, supernovae, interstellar medium, intergalactic medium, extragalactic radio sources, quasars, and big-bang cosmology. (F)

*IDS 258. Theoretical Astrophysics Seminar. (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. The study of theoretical astrophysics. Sponsoring departments: Astronomy and Physics.

Plant Biology

(College of Natural Resources)

Office: 111 Genetics and Plant Biology Building, 642-9595
Chair: Richard Malik, Ph.D.
Professors: Bob B. Buchanan, Ph.D. Duke University. Plant biochemistry
Lewis J. Feldman, Ph.D. Harvard University. Plant physiology/development
Michael Freeling, Ph.D. University of Indiana. Plant development and gene regulation
William Gruissem, Ph.D. University of Bonn. Plant molecular biology
Russell L. Jones, Ph.D. University of Wales. Plant biology
Donald R. Kaplan, Ph.D. University of California at Berkeley. Developmental biology
Wilcoxen, Ph.D. Stanford University. Experimental morphology
Lowell N. Lewis, Ph.D. University of Michigan. Plant physiology and molecular biology
Richard Malik, Ph.D. University of California at Berkeley. Bioenergetics of photosynthesis
Annette H. Mills, Ph.D. Florida State University. Biophysics of photosynthesis
Roderic B. Park, Ph.D. California Institute of Technology. Plant molecular biology
Peter H. Quail, Ph.D. University of Sydney. Plant molecular biology
Zimray Rennes Sung, Ph.D. University of California at Berkeley. Cell biology
Ian M. Sussex, Ph.D. Manchester University. Plant developmental biology.
Norman Terry, Ph.D. Nottingham University. Environmental plant physiology
John A. West, Ph.D. University of Washington. Phycology
Patricia C. Zambrasky, Ph.D. University of Colorado. Plant molecular biology
Ian M. Sussex, Ph.D. Manchester University. Plant developmental biology.
Norman Terry, Ph.D. Nottingham University. Environmental plant physiology

Associate Professors:
Rohin Fischer, Ph.D. University of California at Berkeley. Plant molecular biology
John W. Taylor, Ph.D. University of California at Davis. Mycology

Adjunct Assistant Professors:
Sarah C. Heke, Ph.D. Washington University. Plant developmental genetics
Shelia M. McCormick, Ph.D. University of Missouri. Plant developmental genetics
Athanasios Theologis, Ph.D. University of California at Los Angeles. Plant molecular biology

Undergraduate Advisers: Mr. Melis, Ms. Sung.
Graduate Advisers: Mr. Feldman (Head Adviser), Mr. Fischer, Mr. Gruissem.

Department of Plant Biology

The Department of Plant Biology considers developmental and functional aspects of the biology of plants studied from molecular to organismal levels using a range of organisms, including photosynthetic bacteria, algae, fungi, and vascular plants, as objects of investigation. The recently reorganized department represents a unique amalgamation of traditional botanical sciences, such as plant physiology, plant morphology and anatomy, and the newer biological disciplines of genetics, molecular biology, and biochemistry, to produce new syntheses and educational perspectives in the study of plants. 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 electives, available in the recently completed Genetics and Plant Biology Building, the facilities of the National Science Foundation Center of Plant Developmental Biology and the United States Department of Agriculture Plant Gene Expression Center are available for the programs of the department.

Undergraduate Program

The undergraduate program in plant biology is a broadly based program in biology, emphasizing the study of plants at the organismal, cellular, and molecular levels. Lower division courses are intended to produce a foundation in biological and
physical sciences as a preparation for advanced study at the upper division level in specific areas of plant biology. At the upper division level, the program is structured around a two-semester core that emphasizes developmental, physiological, and biochemical aspects of plant biology. This core is supplemented by two laboratory courses that introduce modern techniques in plant biology. Additional courses in specialized areas in plant biology (mycology, physiology, morphology, and ecology), as well as appropriate courses from other disciplines, are also available at the upper division level.


Upper Division. Molecular and Cell Biology 102, 142; Plant Biology 100A-100B, 101; 130 or Integrative Biology 110 plus 110L, 111 plus 111L, Plant Biology 110 or 120 or Integrative Biology 101 plus 101L or Forestry 142; Forestry 123 or Integrative Biology 151 plus 151L or 154 plus 154L.

For further details, please consult the Announcement of the College of Natural Resources.

Graduate Program

The graduate program in plant biology is designed to train students in modern research areas of plant biology. The department has research expertise in the following areas: molecular, cellular, genetic, biochemical, and structural plant biology. The graduate program includes an introductory two-semester core which emphasizes in an integrated manner the following areas: plant structure, plant physiology, plant biochemistry, plant development, plant cell biology, and plant molecular biology. Additional special topic courses and seminars in areas of individual faculty expertise will also be available.

Prospective students for the graduate program in plant biology will be expected to demonstrate academic excellence and potential for independent scientific research. Students are expected to have a basic background in chemistry, physics, mathematics, and biology, equivalent to the undergraduate program. An admissions committee composed of five members of the department will review applications and make recommendations to the full department for approval.

Graduate Courses

* 200A. Plant Genetics and Regulatory Biology. (4) Two 11/2-hour lectures and one 11/2-hour discussion per week. Prerequisites: Consent of instructor. The course is divided into two parts. The first part considers regulatory mechanisms in plant development with an emphasis on the molecular biology of light-induced physiological responses. The second part considers functional mechanisms and discoveries in plant genetics. Analytical approaches and biochemical mechanisms are applied to current problems in plant gene regulation and evolution. Required core course for the Ph.D.

* 200B. Plant Molecular Biology and Biochemistry. (4) Two 11/2-hour lectures and one 11/2-hour discussion per week. Prerequisites: Consent of instructor. The course is divided into two parts. The first part will consider major aspects of plant cell biology, such as genome structure and function, Embryogenesis and differentiation. The second half will consider problems in plant biochemistry, such as photosynthesis, respiration, and secondary plant metabolism. Required core course for the Ph.D.

* 200C. Plant Cell and Developmental Biology. (4) Two 11/2-hour lectures and one 11/2-hour discussion per week. Prerequisites: Consent of instructor. The course is divided into two parts. The first half will consider major aspects of plant cell biology, such as the mechanism of action of secondary messengers (plant hormones) and the action of proposed "secondary" messengers, such as calcium. The second half will consider cellular aspects of plant development and will focus on the cell wall, the coordinate and cellular motility. Required core course for the Ph.D.

* 211. Advanced Topics in Plant Molecular Biology. (3) Course may be repeated for credit. Four hours of lecture and discussion per week. Prerequisites: Consent of instructor. Formerly Molecular Plant Biol. 288. Topics will be covered in a research-oriented fashion, emphasizing both relevant factual content as well as methodologies. Topics: A. Current experimental techniques for analysis of plant gene expression in response to light, hormones and stress; C. Mobile DNA elements (mechanism of movement and use as experimental tools); and D. Molecular analysis of plant development (embryogenesis, flower development, tissue specific gene expression).

* 222. Photosynthesis. (3) Three 1-hour lectures per week. Prerequisites: Consent of instructor. Formerly Molecular Plant Biology 222.photosynthesis, structure of photosynthetic apparatus, light and dark reactions with special emphasis on energy conversion, photosynthetic phosphorylation, and photosynthesis in subcellular systems.

280. Seminar. (1) May be repeated for credit. One 11/2-hour discussion per week. Prerequisites: Consent of instructor. Formerly Botany 280. Advanced study in...
Plant Pathology involves the study of interactions among plants, pathogens, and their environment, with the objective to develop procedures for the protection of plants from disease. The subject area is exceptionally broad, embracing the response of the plant to the environment and to diseases caused by bacteria, fungi, viruses, and viruses. Plant pathologists are involved in the study of such diverse problems as host-plant physiology, molecular genetics, pathogen genetics, comparative virology, ecological and biological control approaches. Because of the fundamental importance of plants as food, fiber, and recreational resources, the discipline makes an important contribution to human welfare.

Graduate Programs

This program is administered by the Department of Plant Pathology and provides graduate education leading to the M.S. and Ph.D. degrees. Applicants should have a bachelor's degree in plant pathology or an equivalent field that includes a broad background in physical and biological sciences, including bacteriology, mycology, molecular biology, plant cell biology, and plant physiology.

The field is primarily concerned with the study of plant diseases and protection of a wide range of crops from disease losses. The subject area is exceptionally broad, embracing the response of the plant to disease caused by agents, such as bacteria, fungi, seed plants, and viruses, as well as their control. This leads to research on fundamental problems as host-partisite physiology, molecular genetics, comparative virology, and microbial ecology. It includes applied programs such as integrated pest management and biological control. Areas of emphasis include biological determinants of wood; epidemiology and diagnostics of plant diseases; forest pathology; physiology of pathogenic fungi and bacteria; and taxonomy, ecology, and behavior of soil-borne plant pathogens.

The department maintains extensive research facilities, including greenhouses and a broad range of specialized research equipment. One of the largest plant pathology reprint libraries in the world is also maintained.

Requirements for Admission. Prospective students will be expected to show academic excellence and potential for independent scientific research. Students are expected to have a background in the plant sciences, such as plant pathology, plant biology, bioresource sciences, or botany, and a broad background in physical and biological sciences, bacteriology, biochemistry, plant cell biology, and plant physiology. The department Graduate Affairs Committee reviews applications and makes recommendations to the University Graduate Division for admission. Admission to the program is based on upper division and graduate-level GPA's, letters of recommendation, written statements of academic and professional goals, and other evidence of academic and research capabilities. The Graduate Division requires the Graduate Record Examination of all domestic applicants; the TOEFL and TSE are also required for international applicants.

Graduate Studies. New students in the program meet initially with the graduate advisor, who discusses the background of the student and advises on courses of study and research areas. Students are admitted to a particular laboratory, or they may arrange rotations through consultation with the graduate advisor and the major research advisor. Research rotations for students participating in the McKnight program are required in both the department and the Plant Gene Expression Center. All students will be required to take the core curriculum offered by the Department of Plant Pathology. This course work provides basic emphasis in fungal, bacterial, and viral pathogens as well as a review of the principles of plant pathology. Additional courses will be dictated by the student's background and interests, and programs will be individually designed to allow diversity in training for each student.

The Department of Plant Pathology follows the Graduate Division's Plan B for master's degrees. This plan requires a minimum of 24 hours of course work and a two-hour oral examination by three faculty members who advise the student.

Normative time for the Ph.D. program is five years. The oral qualifying examination is normally taken during the fifth semester. The five-member faculty committee for the Ph.D. examination is chosen in consultation with the student.

In addition, Ph.D. students are required to serve as teaching assistants for one semester as part of the training for the degree. The department teaches and participates in undergraduate courses which use teaching assistants, and several faculty teach undergraduate courses in other departments which are also acceptable for fulfilling the teaching requirement. Further details about the program can be obtained by contacting the department.

Upper Division Courses

*100. Introduction to Plant-Microbe Interactions. (3) Two 1-hour lectures and one 3-hour laboratory/discussion per week. Prerequisites: Biology 1A, 1B. An introduction to the basic ecological relationships between plants and microorganisms, with emphasis on those causing plant disease. The molecular, cellular, physiological and ecological basis for these interactions will be considered. The laboratory will include experiments, demonstrations and discussions to supplement information provided in lectures.

Gordon

*105. Modern Applications of Plant Biotechnology. (3) Two 1-hour lectures and one 1-hour discussion/demonstration per week. Prerequisites: Suggested 100A, Molecular and Cell Biology 112; 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. Also listed as IDS 105 and Plant Biology 105.

120. Plant Diseases. (4) Two 1-hour lectures and two 3-hour laboratories per week. Prerequisites: Biology 1A-1B. An introductory course in plant diseases. Diseases studied include those important throughout the world as well as those important in California and include non-infectious diseases as well as those resulting from infection by bacteria, mycoplasma, fungi, viruses, nematodes and phytophagous insects. Students in the laboratory with fresh or preserved material in plant pathology.

123. Introduction to Microbiology of Natural Resources. (4) Two 1-hour lectures and two 3-hour laboratories per week. Prerequisites: A course in Biology Chemistry 6A & 6B. Formerly 23. A survey of the groups of microorganisms bacteria, fungi, protozoa, algae and viruses. The emphasis of the course is on the role of both procaryotic and eucaryotic microbes in the environment, particularly in agriculture. Laboratory work will include current techniques in microbiology. (SP) Epstein

*On leave, spring
^On leave, fall
†Recipient of Distinguished Teaching Award

Various fields of plant biology. Topics will be announced in advance of each semester. Enrollment in more than one section permitted. (F,SP) Staff

298. Plant Biology Group Studies. (1-6) Course may be repeated for credit. Three hours of research/laboratory per week. Prerequisites: Consent of Instructor. Advanced study of research topics which will vary semester to semester. (F,SP) Staff

299. Graduate Research. (1-12) Course may be repeated for credit. Three hours of research/laboratory per week. Prerequisites: Graduate standing. Formerly Botany 299, Molecular Plant Biology 299. Graduate student research. (F,SP) Staff

602. Individual Study for Graduate Students. (1-8) May not be used for unit or resident requirements for the doctoral degree. May be repeated for credit. One 1-hour meeting per week. Must be taken on a satisfactory/fair basis. Prerequisites: Graduate standing. Formerly Botany 602. 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

Plant Pathology (College of Natural Resources)

Department Office: 147 Hilgard Hall, 642-5121 Chair: Milton N. Schroth, Ph.D.

Professors:

Fields W. Cobb, Jr., Ph.D. Pennsylvania State University.

Joseph G. Hancock, Jr., Ph.D. Cornell University. Fungal pathology.

Andrew D. O'Donnell, Ph.D. University of Michigan, Canada.

Plant virology.

Sydney A. Kusitel, Ph.D. University of California, Davis.

Regulation of bacterial metabolism.

Steve A. Landrock, Ph.D. University of Wisconsin. Bacterial ecology.

T. Jack Morris, Ph.D. University of Nebraska. Plant virology, comparative virology.

John R. Pentemg, Jr., Ph.D. University of Wisconsin. Forest pathology.

Nicholas N. Papoulopoulos, Ph.D. University of California at Berkeley. Molecular genetics.

Robert A. Ponn, Ph.D. University of Wisconsin. Fungal ecology.

Ornamental plant pathology.


Albert R. Weinhold, Ph.D. University of California at Davis. Fungal pathology, pathology.

Peter A. Ark, Ph.D. (Emeritus).

Jean L. Ausheuth, Ph.D. (Emeritus).

Kenneth F. Baker, Ph.D. (Emeritus).

Stephan Wnifem, Ph.D. (Emeritus).

Associate Professors:

Oenes C. Huusma, Ph.D. University of California at Davis. Plant pathology, disease and pathogen physiology.

Philip T. Spieh, Ph.D. University of Oregon. Evolutionary biology and population genetics of fungi.

Brian J. Staikoswicz, Ph.D. University of California at Berkeley. Molecular genetics.

Assistant Professors:

Thomas D. Brus, Ph.D. University of Michigan. Fungal molecular evolution.

Lynn Epstein, Ph.D. Michigan State University. Development and Biochemistry of plant pathogenic fungi.

Thomas R. Gordon, Ph.D. University of California at Davis. Fungal ecology.

Adjunct Assistant Professors:

Barbara Baker, Ph.D. Genetic disease resistance.

David W. Ow, Ph.D. Plant viral gene expression.

Undergraduate Program

The Department of Plant Pathology has withdrawn from undergraduate major as of fall 1990. Undergraduates may apply to Bioresource Sciences or Plant Biology for training in plant pathology.

To function as a professional plant pathologist, graduate training to the M.S. level is required, and the Ph.D. is highly desirable. Because of the broad requirements, students are advised to obtain a strong undergraduate background in plant biology or general microbiology.

On leave, spring
^On leave, fall
†Recipient of Distinguished Teaching Award

†On leave, spring
organismal habitats; population dynamics. Enrollment is limited. 

187. Field Study in Plant Pathology. (1-3) Course may be repeated for credit. Three-hour laboratory discussion per week per unit. To be arranged. Must be taken on a pass/no pass basis. Supervised experience in off-campus organizations relevant to specific asp suspect of interest. Field trips will constitute the laboratory portion of the course. (F,SP) Staff

188. Directed Group Study. (1-3) Course may be repeated for credit. Three hours of laboratory/discussion per week per unit. To be arranged. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor. Special topics will be offered from time to time. (F,SP) Staff

189. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Three hours of laboratory/discussion per week per unit. To be arranged. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor. Supervised Independent study (upper division). (F,SP) Staff

Graduate Courses

201. Seminar in Plant Pathology. (1) May be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. An advanced research seminar on topics in plant pathology. (F,SP) Jackson

202. Advanced Plant Pathology. (1) One 1-hour lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly 200A-200B. Introduction to graduate study in Plant Pathology. The course will introduce important principles, provide a historical perspective, and evaluate the role of Plant Pathology in agricultural research. Hancock

204. Plant Bacteriology. (3) Two 1-hour lectures and one 3-hour laboratory discussion per week. Prerequisites: Biology 1A-1B. The systematics, ecology, and genetics of bacterial diseases of plants will be emphasized. Course content will include discussions on factors affecting the survival and pathogenic activities of bacteria including the various mechanisms associated with the invasion and infection of the host. Classical and contemporary methods for controlling diseases will be covered. Laboratory exercises emphasize methods necessary to isolate, identify, and classify bacterial pathogens. (SP) Schroth

205. Fungi in Relation to Plant Disease. (3) Two 1-hour lectures and one 3-hour laboratory discussion per week. Prerequisites: Biology 1A-1B or equivalent. Formerly 200A-200B. Overview of fungal plant pathogens. Lectures will focus on taxonomy, ecology and genetic structure of plant pathogens and symbiotic fungi. Laboratory exercises will stress methods of collection, isolation, culture, identification, and pathogenic manipulation and characterization. Bruns

207. Epidemiology and Control of Plant Disease. (3) Three hours of lecture per week. Prerequisites: 120. Theory and practice of plant disease control and management. Introduction to chemical, biological, and genetic methods. Epidemiology of plant diseases, inoculum-disease relationships, factors involved in the development of epidemics, Lindow

208. Plant Virology. (3) Two 1-hour lectures and one 3-hour laboratory discussion per week. Prerequisites: Biology 1A-1B. The structure, classification, genetics, transmission, epidemiology and disease potential of plant viruses will be emphasized. Course content will include history and development of the science of virology stressing plant virus studies culminating in classification, detection, and control of plant pathology, and biochemistry. Classical and contemporary applications for disease control will be discussed. Jackson, Morris

209. Molecular Plant Pathology. (2) Two 1-hour discussion per week. Prerequisites: Consent of instructor. An integrated approach to the study of disease mechanisms at the molecular, biochemical and cellular level. Emphasis will be placed on using a genetic approach to study pathogenicity and mechanisms of disease resistance in higher plants. Opportunities and limitations for engineering agricultural crops for plant disease control will be covered. Panopoulos

210. Field Plant Pathology: Principles and Practice. (3) One 2-hour lecture and 1 field trip per week. Prerequisites: Consent of instructor. A study of California agriculture and major plant diseases, including disease development in the field; factors affecting disease incidence and severity; and approaches to control. Field trips will constitute the laboratory portion of the course. (SP) Wehnheim

211. Advanced Plant Virology. (1) May be repeated for credit. One hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 200A-200B and consent of instructor. Seminar/discussion by graduate students of current research in the field of plant virology. (F) Jackson, Morris

212. Advanced Soil Microbiology. (1) May be repeated for credit. One hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 200A-200B and consent of instructor. Seminar/discussion by graduate students of current research in the field of soil microbiology with emphasis on plant pathogenic microorganisms and biological control. (F) Hui man

213. Molecular Basis of Plant Disease. (1) May be repeated for credit. One hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 200A-200B and consent of instructor. A critical analysis of the current, literature dealing with molecular basis of plant pathogenesis. Staskawicz

214. Plant Pathogenic Bacteria. (1) May be repeated for credit. One hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 200A-200B and consent of instructor. Seminar/discussion by graduate students of current research in the field of plant pathogenic bacteria. Lindwor, Schroth, Staskawicz

215. Topics in Forest Pathology. (1) May be repeated for credit. One hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 200A-200B and consent of instructor. Seminar/discussion by graduate students of current research in the field of forest pathology. (SP) Cobb

216. Plant Pathogenic Fungi. (1) Course may be repeated for credit. One hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 200A-200B and consent of instructor. Seminar/discussion by graduate students of current research in the field of plant pathogenic fungi. Schroth

288. Directed Group Study. (1-6) May be repeated for credit. Four hour lab/discussion per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Research in plant pathology. (F,SP) Staff

299. Research in Plant Pathology. (1-12) May be repeated for credit. Four hour lab/discussion per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Research in plant pathology. (F,SP) Staff

601. Individual Study for Master's Students. (1-8) May not be used to meet either unit or residence requirements for a master's degree. May be repeated for credit. Four hours of lab/discussion per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study for the comprehensive or language requirements in consultation with the field advisor. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) May not be used to meet either unit or residence requirements for the doctoral degree. May be repeated for credit. Four hours of lab/discussion per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study in consultation with the major field 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

Political Economy of Industrial Societies

(College of Letters and Science)

Group Major Office, International and Area Studies, 201 Moses Hall, 642-4466

Major Advisers: Mr. Abrams (History); Mr. Aggarwal (Political Science); Ms. Bonnell (Sociology); Mr. Buxbaum (School of Law); Mr. Cohen (City and Regional Planning); Mr. Ettinghreem (Economics); Mr. Fishlow (Economics); Mr. Sabini (Economics); Mr. Gregor (Political Science); Mr. Hammel (Anthropology); Mr. Janos (Political Science); Mr. Landau (Governmental Studies); Mr. Leonard (School of Business Administration); Mr. Stoklowski (International and Area Studies); Mr. Reed (Geography); Mr. Reich (Economics); Mr. Rochlin (Governmental Studies); Mr. Rosborg (Political Science); Ms. Sanger (Economics); Mr. Tece (Business Administration); Ms. Tyson (Economics); Mr. Ward (Economics); Mr. Wiensnky (Political Science); Ms. Yellen (Business Administration); Mr. Zysman (Political Science).

Group Major in Political Economy

Political Economy of Industrial Societies provides an issue-oriented approach to problems common to contemporary society, regardless of the political and economic institutions which prevail in them. It is designed to provide students with a broad-based, liberal arts background as well as thinking skills applicable to a variety of public and private-sector fields. The major also provides an excellent background for students seeking admission to graduate programs in any of the social science disciplines and many professional schools.

Although scholars and practitioners have never entirely agreed on a precise definition of political economy as distinguished from the classical social science disciplines, they tend to concur on certain key points. The major involves a study of political economy as the study of problems in which the interaction between political and economic variables plays a central role. While the primary focus of the major involves an application of those political and economic variables to problems of industrial societies, it is by no means limited to them. Comparisons between industrial, industrializing, and developing societies may also be considered.

The PEIS major offers students a chance to study economic issues and their root causes and the institutions and values that have shaped them. They also concentrate on planning and problem solving; on resource use and distribution; and on challenges of institutional adaptation, value innovation, and changing political equilibria.

In order to achieve this, PEIS majors study issues such as the impact of political participation on decision making. Other questions raised include: Which goals should prevail—increased production and consumption of goods and services or ecological management? Which institutions are most appropriate for solving contemporary problems—classical capitalism, communism, democratic socialism, or some mixture? Will state planning prevail over political and market competition as the allocator of wealth? What is the impact of international interdependence on efforts to cope with problems of high industrialism?

Each student in the major creates an individualized plan of study designed to provide a well-rounded understanding of economic issues and the opportunity to study issues mentioned above and to explore the many other aspects of political economy.

For a detailed description of the program and course offerings, please obtain a brochure from the Group Major Office.
Declaration of Major. Berkeley students must declare the major no later than the semester in which they are completing their 61st unit. Unless they declare well before reaching the maximum number of units, they must have completed two of the required lower division courses and must be enrolled in a third. Students transferring in their junior year should declare by the second semester at Berkeley before declaring. They must have no more than 75 completed units and must have completed two of the lower division prerequisites and be in the process of completing a third.

Students will be admitted to PEJS if their grade-point average in courses relevant to the major is at least 3.2. Relevant courses include courses in business administration, economics, political science, history, mathematics, statistics, city planning, public policy, political science, anthropology, geography, and anthropology courses. In addition, the faculty committee reserves the right to review transcripts and statements of purpose and to interview any student seeking admission to the major with a grade-point average in relevant course work under 3.2. In reviewing these candidates, the committee will consider factors such as a) demonstrated interdisciplinary interest, independent research, special projects, etc.; b) extracurricular academic activities such as work, internships, participation in student conferences; and c) demonstrated ability to clearly and intelligently state legitimate reasons for interest in the major in a five-page statement of purpose.

Please check with the Group Major Office regarding current eligibility requirements and application procedures. At the time this catalog was published, revisions were under consideration.

Advising. In the major, great importance is assigned to advising. The purpose of advising is to give students personal interests the appropriate academic orientation within the major’s intellectual goals. When declaring, students must decide on a plan to complete the major, to be discussed and approved by a major adviser. Changes in the plan must also be approved by an adviser.

Lower Division. Economics 1, Introduction to Economics; History 5, Modern European History; History 7B, U.S. History from the Civil War to the Present; Political Science 2, Comparative Politics; Statistics 2, 20, 21 or Anthropology 190A; optional: Mathematics 1A-1B (required only of students taking Economics 101A-101B to satisfy the methodology requirement) must be taken in addition to the other lower division requirements, not in lieu of them.

Introductory courses on data processing and computer science are strongly recommended.

Upper Division. 30-36 units. Upper division courses are organized as follows: Methodology (two courses), Introductory sequence (two courses), fields of concentration (seven courses).

Methodology. Economics 100A-100B or Economics 101A-101B.

Introductory Sequence. PEIS 100 or Political Science 138B or History 160 or 161 or Economics 115; and PEIS 101 or Political Science 120A or 126A or 126B.

Fields of Concentration. Seven Courses. No more than two courses from any one department may be used to fulfill the following course work:

Note: Course additions and deletions are frequently made within fields. Consult the program brochure for updated information.

I. Models of the Industrial State: Three one-semester courses.


II. Systems of Interdependency: one one-semester course.

Agriculture and Resource Economics 231; Anthropology 148; Biology 150; Business Administration 188; Conservation and Resource Studies 110, 163; Economics 111B, 115, 162, 181, 182, 183; History 130A, 130B, 162A, 162B; Interdepartmental Studies 180, 187; Military Affairs 121, 126, 127; Political Science 120A, 120B, 121, 122, 124A, 124B, 125, 126A, 126B, 127, 129C, 137A.

III. Planning and Policy Making: one one-semester course.

Business Administration 112, 190; City and Regional Planning 110, 112, 127, 250; Economics 123, 136, 152, 155, 156, 171, 172, 173; Geography 110; Mass Communications 103; Political Science 125, 125B, 125E, 182, 184, 185, 187A, 187C; Public Policy 170, 173, 174, 176, 177, 179, 180, 181, 184, 185, 189.

IV. Additional Field Courses: two one-semester courses.

Resource Management:

Human: Anthropology 115; Business Administration 150, 151, 154, 156; Conservation and Resource Studies 160; Economics 121, 151, 157; Geography 125; Legal Studies 145, 180; Political Economy of Natural Resources 141; Population Studies 100; Psychology 180; Sociology 113, 116, 126.

Environmental: Anthropology 148; Biology 150; Conservation and Resource Studies 110, 115, 150, 151, 163, 169; Economics 125, 155, 156; Energy and Resources 100; Geography 101, 120, 125, 130, 131, 132; Political Economy of Natural Resources 100, 101, 102, 151; Public Policy 181; Sociology 125.

No course taken to fulfill major requirements may be taken passed/not passed.

Up to two substitutions of courses may be permitted in the major with the approval of a major adviser. Any course not officially approved by the Executive Committee of the College of Letters and Sciences used in the group major program is considered a substitution.

A maximum of three courses outside the College of Letters and Science may be included in the major, e.g., courses in business administration, city and regional planning, conservation and resource studies, education, engineering, political economy of natural resources, social welfare, and journalism.

Honors Program. Students accepted into the honors program will enroll in Political Economy of Industrial Societies H195A-H195B. Senior Honors Seminar (4-4): One 2-hour seminar plus 1-hour consultation per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Senior Standing. Check with the faculty office for current requirements. The honors student is required to write a thesis on research performed in the H195A-H195B course. The thesis will be reviewed by the honors instructor and second reader to be selected based on the thesis topic.

H195A-H195B. Special Field Research. (1-6) May be repeated for credit. Individual and/or individual projects. Group meetings, to be announced. Must be taken on a passed/not passed basis. Prerequisites: Written consent of instructor. Supervised experience relevant to specific aspects of Political Economy of Industrial Societies in off-campus organizations. Regular individual meetings with the faculty sponsor and written reports required. (F,SP)

197. Field Studies. (1-4) May be repeated for credit. Group meetings, to be announced. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Supervised experience relevant to specific aspects of Political Economy of Industrial Societies in off-campus organizations. Regular individual meetings with the faculty sponsor and written reports required. (F,SP)

198. Directed Group Study. (1-4) May be repeated for credit. Group meetings, to be announced. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. (F,SP)

199. Supervised Independent Study and Research for Undergraduates. (1-4) May be repeated for credit. Individual meetings, to be announced. Must be taken on a passed/not passed basis. Prerequisites: Written proposal must be approved by a faculty advisor. (F,SP)

On leave, spring

Recalled to active service

Recipient of Distinguished Teaching Award

Upper Division Courses

100. Classical Theories of Political Economy. (3) Three hours of lecture and one hour of discussion per week. One-semester lecture course offered each fall. Strong emphasis is placed on a philosophical-analytical analysis of the classical political economy literature, including such authors as Locke, Smith, Marx, Mills, and Weber to Veblen and Polanyi. Strong emphasis is placed on providing appropriate background for understanding the development of the literature that has emanated from the various social science disciplines which forms the basis of modern political economy. (F,SP)

101. Contemporary Theories of Political Economy. (3) Three hours of lecture and one hour of discussion per week. One-semester lecture course offered each fall. This course covers the study of classical political economy of PEJS 100 with an examination of contemporary applications of political economic theory. (F,SP)

102. Scope and Methods of Research in Political Economy. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor and background in political economy required. Topics in methodology and their applications in 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 a paper and presentation. Topics change each semester. (F,SP) Epstein

191. Special Field Research. (1-6) May be repeated for credit. Individual and/or individual projects. Group meetings, to be announced. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Supervised experience relevant to specific aspects of Political Economy of Industrial Societies in off-campus organizations. Regular individual meetings with the faculty sponsor and written reports required. (F,SP)

198. Directed Group Study. (1-4) May be repeated for credit. Group meetings, to be announced. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. (F,SP)

199. Supervised Independent Study and Research for Undergraduates. (1-4) May be repeated for credit. Individual meetings, to be announced. Must be taken on a passed/not passed basis. Prerequisites: Written proposal must be approved by a faculty advisor. (F,SP)

On leave, spring

Recalled to active service

Recipient of Distinguished Teaching Award
Political Science
(College of Letters and Science)

Department Office: 210 Barrows Hall, 642-6323
Chair: David Collier, Ph.D.

Professors:
George W. Breslauer, Ph.D.
Bruce E. Clay, Ph.D.
David Collier, Ph.D.
Jyotihrinda Das Gupta, Ph.D.
Ghulam Q. Ghafoor, Ph.D.
Lowell Dittmer, Ph.D.
A. James Gregor, Ph.D.
Ernst B. Haas, Ph.D. (Robson Research Professor of Governance).

Assistant Professors:
Jacob Citrin, Ph.D.
Peter W. Sperlich, Ph.D.
Robert L. Powell, Ph.D.
Henry E. Brady, Ph.D.

Associate Professors:
Victor Jones, Ph.D. (Emeritus)
George Lenczowski, LL.M., J.S.D. (Emeritus)
Eugene C. Lee, Ph.D. (Emeritus)
Robert A. Scalapino, Ph.D. (Emeritus)

Graduate Program

American Politics

100. Labor, Professions, and Bureaucracy. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: One lower division course in political science, economics, or sociology. The organization of work and the nature of work experience in modern society. Social attention to labor force trends in the U.S.; the character of the "service sector"; structural determinants of occupational choice; the structure, functions, and power of labor unions, business enterprises, and professions; work reform movements and economic democracy. (F,SP)

102. The American Executive. (4) Three hours of lecture and one hour of discussion per week. Analysis of principal institutions, functions, and problems of the Presidency and the federal executive branch. Special attention will be given to topics of political leadership, staffing, executive-legislative relations, and policy formation. Comparative reference to executive processes in other political systems. (F,SP)

103. Congress. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1 or consent of instructor. Nomination and election, constituency relations, the formal and informal structures of both houses, relations with the executive branch, policy formation, and lobbying. (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, state, national, and local party systems and their variations. Nominations and elections. One directed research paper will be required. (F,SP)

105. The Politician. (4) Three hours of lecture and one hour of discussion per week. The nature of politics, the education of politicians, the structure of ambition, and the ethical values of social behavior in the political world. Sessions with elected officials and party workers on their vocation. Directed field research. (F,SP)

106. Social Groups and Political Power. (4) Three hours of lecture and one hour of discussion per week. Privilege, power and public policy: the nature and causes, strategy and tactics of group power in the context of the American institutional setting. Business, agriculture, labor, the military, black protest and other significant loci of power. Implications for a democratic society. (F,SP)

107A. The Policy Process. (4) Three hours of lecture and one or two hours of discussion per week. How policy is "made" in the United States. How issues get on the political agenda, the role of legislatures, executives, courts, bureaucracies, interest groups, and parties in formulating public policies; policy implementation and policy evaluation. (F,SP)

107B. Public Policy Doctrines. (4) Three hours of lecture and one or two hours of discussion per week. History, principles, and impact of public policy in the United States in areas like education, social welfare, taxation, business regulation, racial discrimination, employment, environment, and consumer protection. Range of topics will vary. (F,SP)

108. Selected Topics in American Politics. (4) Three hours of lecture and one hour of discussion per week. See departmental announcement.

109. Women and Politics. (4) Three hours of lecture and one hour of discussion per week. Analysis of women in politics from a historical as well as theoretical perspective. The role and contributions of women in American politics, including women's roles in the political process, women's political representation, and women's rights movements. (F,SP)

110. Labor, Professions, and Bureaucracy. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: One lower division course in political science, economics, or sociology. The organization of work and the nature of work experience in modern society. Social attention to labor force trends in the U.S.; the character of the "service sector"; structural determinants of occupational choice; the structure, functions, and power of labor unions, business enterprises, and professions; work reform movements and economic democracy. (F,SP)

112. The American Executive. (4) Three hours of lecture and one hour of discussion per week. Analysis of principal institutions, functions, and problems of the Presidency and the federal executive branch. Special attention will be given to topics of political leadership, staffing, executive-legislative relations, and policy formation. Comparative reference to executive processes in other political systems. (F,SP)

113. Congress. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1 or consent of instructor. Nomination and election, constituency relations, the formal and informal structures of both houses, relations with the executive branch, policy formation, and lobbying. (F,SP)

114. 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, state, national, and local party systems and their variations. Nominations and elections. One directed research paper will be required. (F,SP)

115. 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 elected officials and party workers on their vocation. Directed field research. (F,SP)

116. Social Groups and Political Power. (4) Three hours of lecture and one hour of discussion per week. Privilege, power and public policy: the nature and causes, strategy and tactics of group power in the context of the American institutional setting. Business, agriculture, labor, the military, black protest and other significant loci of power. Implications for a democratic society. (F,SP)

117A. The Policy Process. (4) Three hours of lecture and one or two hours of discussion per week. How policy is "made" in the United States. How issues get on the political agenda, the role of legislatures, executives, courts, bureaucracies, interest groups, and parties in formulating public policies; policy implementation and policy evaluation. (F,SP)

117B. Public Policy Doctrines. (4) Three hours of lecture and one or two hours of discussion per week. History, principles, and impact of public policy in the United States in areas like education, social welfare, taxation, business regulation, racial discrimination, employment, environment, and consumer protection. Range of topics will vary. (F,SP)

118. Selected Topics in American Politics. (4) Three hours of lecture and one hour of discussion per week. See departmental announcement.

119. Women and Politics. (4) Three hours of lecture and one hour of discussion per week. Analysis of women in politics from a historical as well as theoretical perspective. The role and contributions of women in American politics, including women's roles in the political process, women's political representation, and women's rights movements. (F,SP)
ical perspective. This course will examine the strategy and tactics of women’s political groups and the relationship between various stages of the women’s movement and political events. (F,SP)

110. Cal-in-the-Capital. (4) Three hours of seminar and one hour conference per week. Must be taken on a passed/not passed basis. Prerequisites: Limited to summer Cal-in-the-Capital interns. The course is designed to provide prospective interns with the opportunity to gain firsthand understanding of some important issues facing our national government and an appreciation of the way these issues are dealt with in Washington, D.C. The course deals with the internship experience through class members’ the opportunity to work with Berkeley experts who will make demands of the students’, research skills. (Staff)

111. Political Cultures. (4) Two 1½-hour lectures and one hour discussion per week. The formation of preference — who wants what, when, and why. How and why people organized in various ways of life (or cultures) perceive the world in different ways. (F,SP)

Political Theory

112A. History of Political Theory. (4) Three hours of lecture, one hour of discussion, and one hour of conference per week. Major theories from the ancient Greeks to the modern period. Ancient and medieval political thought, including Plato, Aristotle, and St. Augustine. (F,SP)

112B. History of Political Theory. (4) Three hours of lecture, one hour of discussion, and one hour of conference per week. Early modern political thought up to the French Revolution, including Machiavelli, Hobbes, Locke, and Rousseau. (F,SP)

112C. History of Political Theory. (4) Three hours of lecture, one hour of discussion, and one hour of conference per week. Nineteenth and twentieth century political thought, including Burke, Utilitarianism, Marx, and contemporary theory. (F,SP)

113A-113B. American Political Theory. (4:4) Three hours of lecture and two hours of discussion per week. Basic problems of political theory as viewed within the context of American domestic and institutional traditions. (F,SP)

114. The Theorists and Their Theories. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: One semester of 112 or 113. Intensive study of one great political theorist. Topic will vary with instructor. (F,SP)

115A-115B. Marxist Political Theory. (4:4) Three hours of lecture and one hour of discussion per week.

A. The development of Marxist theory during Marx’s lifetime.

B. The development of Marxist theory after Marx’s death. (F,SP)

115C. Marxism and Communist. (4) Two 1½-hour lectures and one hour of discussion per week. The purpose of this course is to trace the development of Marxism as an idea system and political ideology since its inception, focusing particularly on developments in “Communist or State Socialist” systems, but also including a brief look at Eurocommunists thought. (F,SP)

116. Selected Topics in Political Theory. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: One semester of 112 or 113. Intensive study of topic problem or intellectual movement in political theory. Topic will vary with instructor. (F,SP)

117. Political Theory in Nonwestern Societies. (4) Three hours of lecture and one hour of discussion per week. Political Thought in Far Eastern, South Asian, and African societies. The impact of modern Western thought on non-Western political theories and views. Emphasis on current ideological trends, nationalist movements, and the impact of modern Western and neo-Marxist thought. (F,SP)

International Relations

120A. International Relations. (4) Three hours of lecture and one hour of discussion per week. Comparative foreign policy. (F,SP)

120B. International Relations. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 120A. Theory of international relations. (F,SP)

121. International Organizations. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 120B. United Nations, Organization of American States, NATO, Warsaw Pact, Organization of African Unity, Arab League. (F,SP)

122. International Law. (4) Two 1½-hour lectures per week. The formation of international law to the end of the 19th century, with emphasis on modern legal rules governing international relations. It includes the rules of customary law as well as the law of treaties. Special attention is given to modern development such as the law of the sea, relations of the environment, and the use of force. In addition, the course will focus on the emerging laws of the United Nations. (F)

123. Selected Topics in International Relations. (4) May be repeated for credit with a different topic or consent of instructor. Three hours of lecture and one hour of discussion per week. Prerequisites: 120A or 120B or consent of instructor. See departmental announcements. Topic will vary with instructor. (F,SP)

124A. War and Politics in History. (4) Three hours of lecture one hour of discussion per week. The nature and causes of war: the relationship of politics to war. The interaction of military strategy, economic forces, and the international system. (F,SP)

124B. Politics and Military Strategy. (4) Three hours of lecture and one hour of discussion per week. The interrelationships among military strategy, politics, economic policies, and the use of force. (F,SP)

125. Science, Technology and International Politics. (4) Three hours of lecture and one hour of discussion per week. Major theories, from the ancient Greeks to the modern period. Ancient and medieval political thought, including Plato, Aristotle, and St. Augustin. (F,SP)

126A-126B. International Political Economy. (4:4) Three hours of lecture and one hour of discussion per week. The formation of foreign economic policies and the role of national security, liberation, and international political stability in the international community. Analysis of current policy alternatives in the light of modern economic and political theory. (F,SP)

127. American Foreign Policy. (4) Three hours of lecture and one hour of discussion per week. Analysis of competing views of the American “national interest” and the definition and implementation of such international conflict issues as national security, international trade, socialism, and the development of the International Monetary Fund. (F,SP)

128A-128B. The American Role in Asia. (4:4) Three hours of lecture and one hour of discussion per week. Economic concepts in the study of international political behavior. Political concepts influencing the choice of economic policies. (F,SP)

129. Revolutionary Change. (4) Three hours of lecture and one hour of discussion per week. Theories of revolutionary violence, rebellion, and revolution. (F,SP)

130. Revolutionary Movements. (4) Three hours of lecture and one hour of discussion per week. Analysis of political change in socialist countries and the impact of socialist revolutions on their political systems. (F,SP)

131. Political Inquiry. (4) Three hours of lecture and one hour of discussion per week. To be repeated for credit with a different topic or consent of instructor. Three hours of lecture and one hour of discussion per week. Credit and grade be awarded upon completion of the sequence. Comprehensive introduction to research methods, statistical analysis, and computer usage in the social sciences. Emphasis on critical analysis and interpretation of existing empirical research and individual student research projects. Meets basic methodological needs of all political and social science majors. (F,SP)

132. Selected Topics in Quantitative Methods. (4) May be repeated for credit with a different topic or consent of instructor. Three hours of lecture and one hour of discussion per week. Prerequisites: 131 or 132. See departmental announcements. Topic to vary with instructor. (F,SP)

Comparative Politics

136A. Theory in Comparative Analysis. (4) Three hours of lecture and one hour of discussion per week. Major themes in comparative analysis. Political systems, culture, authority and other themes in the study of comparative politics. Practical experience of research with instructor. For details consult departmental announcements. (F,SP)

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 construction. Methodological issues that arise in comparing national units and in making comparisons across different cultures. (F,SP)

137A. Revolutionary Change. (4) Three hours of lecture and one hour of discussion per week. Theories of revolutionary violence, rebellion, and revolution. (F,SP)

137B. Revolutionary Movements. (4) Three hours of lecture and one hour of discussion per week. Analysis of political change in socialist countries and the impact of socialist revolutions on their political systems. (F,SP)

137C. intellectuals In Politics. (4) Three hours of lecture and one hour of discussion per week. The role of intellectuals in the struggle for power. (F,SP)

137D. Intellectuals as a social group in the process of "modernization." Definitions of "intellectual," Renaissance antecedents, men of letters in the eighteenth century, the Romantic reaction. Intellectuals as a social group in the process of "modernization." (F,SP)

138A. Modern Democracy. (4) Three hours of lecture and one hour of discussion per week. Political process in modern political systems, culture, authority and other themes in the study of comparative politics. Practical experience of research with instructor. For details consult departmental announcements. (F,SP)

138B. The Industrial State. (4) Three hours of lecture and one hour of discussion per week. Political process in modern political systems, culture, authority and other themes in the study of comparative politics. Practical experience of research with instructor. For details consult departmental announcements. (F,SP)

139. Political Science / 333
138C. Comparison of Party Systems. (4) Three hours of lecture and one hour of discussion per week. The course provides an introduction to the study of political parties and party systems in democratic societies. It examines the historical origins of parties and party systems, as well as main lines of cleavage in democratic politics. The course also assesses the influence of ideology, electoral systems and parliamentary arrangements, governing coalitions, and the policy consequences of political parties. (F,SP)

138D. Comparative Political Economy. (4) Three hours of lectures and one hour of discussion per week. Prerequisites: Two lower division courses in social sciences or history or consent of instructor. Political, social, cultural impact of economic growth in rich countries. Critical examination of major images of modern society—"industrial," "post-industrial," "mass," "capitalist." Analysis of convergence and divergence among market-oriented democracies emphasizing class structure, minority groups, the welfare state, popular culture and political parties, the role of experts and intellectuals. (F,SP)

139A. Development Politics. (4) Three hours of lecture and one hour of discussion per week. Modernization, development and political change. Relating general theories of change to processes of political, economic, and social development within several third world contexts. (F,SP)

139B. Development Politics. (4) Three hours of lecture and one hour of discussion per week. Politics of economic development in developing counties. Comparative analysis of the theories and practice of development in the light of contemporary experience. Political strategies of agrarian, industrial, educational, and regional development and their impact on autonomy, welfare, justice, and human development. (F,SP)

135C. Selected Issues of Development Politics. (4) May be repeated for credit as topic varies. Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. See departmental announcements. Topics will vary with instructor. (F,SP)

140A. Authoritarian Government. (4) Three hours of lecture and one hour of discussion per week. Authoritarianism in traditional and revolutionary societies. Tensions between personal and institutional power, legitimacy and efficiency, political ends and bureaucratic means. (F,SP)

140B. Comparative Communism. (4) Three hours of lecture and one hour of discussion per week. The formation and evolution of Eastern European communist state systems: methods of economic modernization; education principles and practices, roles of socio-economic groups in communist society; revolutionary tactics and state-building. Examples drawn from Asia, East Europe, Latin America, (F,SP)

140C. Selected Topics in Communist Politics. (4) Course may be repeated for credit with a 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. (F,SP)

140D. Selected Topics in Comparative Politics. (4) Three hours of lecture and one hour of discussion per week. See departmental announcements. (F,SP)

Area Studies

141A. Soviet Politics. (4) Three hours of lecture and one hour of discussion per week. Introduction to Soviet politics. Political history of the USSR from Lenin through Brezhnev. Emphasis on policy priorities, and the nature of politics as these evolved over time. Law, economics, and society as related to government and politics. (F,SP)

141B. Soviet Politics. (4) Three hours of lecture and one hour of discussion per week. Selected themes in contemporary Soviet internal affairs; the nature of the Brezhnev era. Eastern European and international issues include leadership, political succession, economic and ethnic policy; political stability and the future. (F,SP)

141C. East European Politics. (4) Three hours of lecture and one hour of discussion per week. A study of the political process in relation to social structure and national diversity. A comparison of communist and prewar political systems, and an analysis of contemporary political developments. (F,SP)

142A-142B. Middle East Politics. (4) Three hours of lectures and one hour of discussion per week. The Middle East in world affairs, international relations and domestic policies of contemporary states in the Middle East; policies and strategy of major powers; supranational movements, regional political and security organizations. The area comprises Turkey, Iran, Afghanistan, Iraq, and the Arab countries. (F,SP)

143A-143B. Northeast Asian Politics. (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 on such topics as nationalism, political modernization, and ideology. (F,SP)

143C. Southeast Asian Politics. (4) Three hours of lecture and one hour of discussion per week. The impact of cultural variables on political behavior. The effect of Southeast Asian politics on the "Indian influence," religious values, economic change, patron-client relations, and the psychological roots of colonialism. (F,SP)

143D. Policy Problems of Southeast Asia. (4) Three hours of lecture and one hour of discussion per week. Subject will vary with instructor. (F,SP)

145A-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. (F,SP)

146A. African Politics. (4) Three hours of lecture and one hour of discussion per week. Introduction to African politics of sub-Saharan Africa. Focus on the relationship of politics to social and economic change. Emphasis is placed on the basic problems and challenges faced by the post-colonial states of the region, and on alternative strategies for state-building, political instability, "neo-colonialism," are among the specific topics that are discussed. (F,SP)

146B. African Politics. (4) Three hours of lecture and one hour of discussion per week. In-depth analysis of several African states, focusing on the formation of their contemporary state structures and political systems, and the nature of current political processes and problems. Cases are chosen so as to highlight contrasting political strategies for the pursuit of economic development and modernization. (F,SP)

146C. Conflict and Change in Southern Africa. (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 political actors is placed within the context of regional political change 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. (F,SP)

147A. Western European Politics. (4) Three hours of lecture and one hour of discussion per week. The origins and development of state and society in Western Europe from the Middle Ages to the Industrial Revolution. Feudalism, the estate society, absolutism, constitutionalism. State building, authority, and social relations. (F,SP)

147B. Western European Politics. (4) Three hours of lecture and one hour of discussion per week. Western Europe from the construction of the corporate state. Patterns of industrialization and social conflict. Mass politics and party systems. Democratic and authoritarian paths to development. (F,SP)

147C. British Politics. (4) Three hours of lecture and one hour of discussion per week. The British people and their country, government and economy. Mass media, voters and elections. The party system. The British Constitution. Institutions of government, parliament, cabinet, monarchy, administration, the courts, Regionalism and local government. Public policy. (F,SP).

147D. Southern European Politics. (4) Three hours of lecture and one hour of discussion per week. Nationalism, political development, and current political problems in Southern European countries. Comparison with the politics of continental Europe. (F,SP)

147E. U.S.-European Relations. (4) Three hours of lecture and one hour of discussion per week. A lecture course which assumes no previous study of U.S.-European relations. This course will review the history of the Atlantic Alliance, especially the creation of NATO, and the conflicts that were common between the U.S. and Europe in the 1950's and 1960's. It will also review more recent sources of conflict, including detente, crisis outside of the NATO area, military burden sharing, money and trade. (F,SP)

147F. The Politics of France. (4) Three hours of lecture and one hour of discussion per week. The development of French politics in the twentieth century. Political parties and institutions of government. Domestic and foreign policies. (F)

147G. Government and Politics of Germany. (4) Three hours of lecture and one hour of discussion per week. Development of political institutions in the twentieth century. Political parties and institutions of government. Domestic and foreign policies. (F)

Public Law and Jurisprudence

150. The American Legal System. (4) Students who have taken 150A during the 1983-84 or 1984-85 academic year will receive no credit for 150. Two 1 1/2-hour lectures and one hour of discussion per week. The nature of the American legal system; the interrelationship 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 will receive no credit for 151. 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 level. (F,SP)

157A-157B. Constitutional Law of the United States. (4,4) Two 1 1/2-hour lectures and one hour of discussion per week. Fundamental principles of constitutional law, leading cases, causes, and consequences of legal decisions. A. The Federal System B. Civil Liberties (F,SP)

158. Selected Topics in Public Law and Jurisprudence. (4) Two 1 1/2-hour lectures and one hour of discussion per week. See departmental announcements. (F,SP)

Political Behavior

151. Public Opinion, Voting and Participation. (4) Three hours of lecture and one hour of discussion per week. The nature of public opinion, attitude formation, electoral turnout and choice; political cleavages; the role of the mass public. (F,SP)

162. Communications and Politics. (4) Three hours of lecture and one hour of discussion per week. The role of mass communication, propaganda, political persuasion, and information campaigns in the political process. (F)
163. Religion and Politics. (4) Three hours of lecture and one hour of discussion per week. The role of religion in politics varies from authoritarian organizations, ideological, and behavioral perspectives. (SP)

164A. Political Psychology and Involvement. (4) Three hours of lecture and one hour of discussion per week. Personality factors in political behavior; psychological roots of decision-making; leadership, psychological sources of political behavior; conflict theory. (F)

164B. Political Psychology and Involvement. (4) Three hours of lecture and one hour of discussion per week. Personality factors in political behavior; psychological roots of decision-making; leadership, psychological sources of political behavior; conflict theory. (F)

168A-168B. Seminar in Political Behavior. (4-4) Three hours of lecture and one hour discussion per week. Prerequisites: For advanced undergraduates. Analysis of theories, findings, and significant studies in the field. Topics: ideology, voting participation, party identification, political conformity, tolerance, dissent, personality and group influence on political beliefs and conduct. (F,SP)

169. Selected Topics in Political Behavior. (4) Three hours of lecture and one hour of discussion per week. See departmental announcements. (F,SP)

Sub-National Government and Politics

170. Comparative State Politics. (4) Two 1/2-hour lectures and one hour of discussion per week. The role of the states in the federal system; the structure and operation of state government, including political institutions, parties, interest groups, and the determinants of policy outcomes. (SP)

171. California Politics. (4) Two 1/2-hour lectures 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. (F)

175A. Urban and Metropolitan Government and Politics. (4) Two 1/2-hour lectures 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)

175B. Urban and Metropolitan Government and Politics. (4) Two 1/2-hour lectures and one hour of discussion per week. Metropolitan regions: planning, decision-making, and administration. (SP)

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, elderly, 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)

177A-177B. Political Internship Program. (4-4) Three hours of lecture; 15-20 hours field work 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, elderly, 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)

178. Selected Topics in Sub-National Politics. (4) Two 1/2-hour lectures and one hour of discussion per week. The role of various levels of government—local, regional, state, and national—in politics and policy-making in metropolitan regions. (F)

Public Organization, Administration, and Policy

181. Public Organization, Administration, and Policy. (4) Three hours of lecture and one hour of discussion per week. The role of public organizations in the American political system. An introduction to theories of organizational behavior. The effects of administrative structure upon the creation and distribution of public benefits. (F,SP)

182. Public Policy and Administration in Developing Countries. (4) Three hours of lecture and one hour of discussion per week. The political economy of policy-making and administration for economic development in selected developing countries. (F)

183. Administrative Behavior. (4) Two 1/2-hour lectures and one hour of discussion per week. The dynamics of public policy formulation within bureaucratic organizations; the influence upon public organizations of the legislature and pressure groups; patterns of conflict within public organizations. (SP)

185. Public Policy and Decision Analysis. (4) Three hours of lecture and one hour of discussion per week. Variations in decision-making and policy-analytical approaches, concepts of rationality in politics, analysis of the political uses of policy analysis, game theory, bargaining as applied to policy issues. (F)

187A. Seminar: Bureaucracy and the Modern State. (4) Three hours of seminar and one hour of conference per week. The comparative study of bureaucracies and decision making within the modern bureaucratic state. The impact of parts of policies resulting from the interaction of environment and institutions. (F)

187C. Seminar: Technology and Politics. (4) Three hours of lecture and one hour of discussion per week. The relationship of technology to social/political change, scope of challenges of democratic governance, and the development of public and private decision-making roles of various governmental, political, and economic institutions. (F)

189. Selected Topics in Public Organization and Policy. (4) Three hours of lecture and one hour of discussion per week. See departmental announcements. (F,SP)

Special Studies

H190A-H190B. Honors Seminars. (4-4) Four hours of seminar per week. Prerequisites: Senior honors candidates and consent of instructor. Offerings vary from year to year. May be one or two semesters. Credit and grade awarded upon completion of thesis. Applications and details through the Undergraduate Office. (F,SP)

191. Experimental Courses. (3) Three hours of lecture per week. See departmental announcements. (F,SP)

H192. Honors Seminar. (4) Three hours of lecture and 1 hour of conference per week. Honors seminar following, or in conjunction with, a regular lecture course. Open only to students who have taken, or are taking, the related lecture course. (F,SP)

H195A-H195B. Senior Honors Thesis. (4-4) Four hours each week. Prerequisites: Senior honors candidate and consent of instructor. Offerings vary from year to year. May be one or two semesters. Credit and grade awarded upon completion of the sequence. Applications and details through Undergraduate Office. (F,SP)

196. Special Research Project. (1-4) The course may be repeated for credit. Regular individual meetings with faculty sponsor. Prerequisites: Consent of faculty sponsor and department chairman. Independent study of an advanced topic resulting in a substantial research paper. (F,SP)

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 chairman. Supervised experience of an advanced topic resulting in a substantial research paper. (F,SP)

*Not offered 1991-92
*On leave, spring
*On leave, fall
*Recipient of Distinguished Teaching Award

198. Directed Group Study for Undergraduates. (1-3) By arrangement with faculty. Must be taken on a passed/not passed basis. Prerequisites: Course must be an extension of an existing Political Science course. 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. (1-3) Offered for credit. By arrangement with faculty. Must be taken on a passed/not passed basis. 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 works to be studied vary with instructor. See departmental announcements. (F)

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 relations between domestic political developments and the international system. The effect of economic development on political change. The effect of labor politics on national politics. (F,SP)

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. (F)

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. (SP)

203. Comparative Analysis of Communist Societies. (4) Three hours of seminar per week. An analysis of the international behavior of Communist systems, with particular reference to institutional and ideological differences, presented at an advanced level for graduate students. Discussion and papers required. (F)

204. Authoritarianism. (4) Three hours seminar per week. An advanced analytic, descriptive, theoretical, and normative inquiry into the concept authoritarianism. Lectures and discussions will review prevailing definitions, pursue descriptive accounts of the history and current practices of authoritarian systems, undertake comparative analyses of different systems and compare attempts at theory construction dealing with such politics. Efforts will be made to address the normative issues involved in the treatment of authoritarianism—particularly in its modern variants. (SP)

205. The Nation-Building Process. (4) Three hours lecture 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 relation 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. (F)

207. Revolutionary Change. (4) Three hours seminar per week. Analysis and comparative study of the occurrence of various forms of revolution in society. (F,SP)

On leave, spring
*Recipient of Distinguished Teaching Award
Materials are drawn from political philosophy, systems theory, and empirical research. (SP)

208. Development Policy. (4) Three hours 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 agriculture, industry, educational development and their implications for national development, prosperity, justice, and human capability. Students from other disciplines are welcome. (F,SP)

209A. Comparative Political Economy. (4) Emphasis on three models of modern society—"post-industrial," "liberal," and "corporativist."—that they apply to different countries and similar in economic level but different in culture and politics to explore (a) the development or effects of the welfare state; (b) divergence in particular public policies (e.g., regarding labor, the family, health, safety, etc.); (c) the reasons (or reasons) for differences in the political legitimacy and the fiscal crisis. (SP)

209B. Comparative Public Policy. (4) Two hours, seminar and one hour conference per week. Contrast national responses to similar social problems among rich countries. Students will compare two or more nations similar in economic level but different in culture and politics to explore (a) the development or effects of the welfare state; (b) divergence in particular public policies (e.g., regarding labor, the family, health, safety, etc.); (c) the reasons (or reasons) for differences in the political legitimacy and the fiscal crisis. (SP)

210. Selected Topics in Comparative Politics. (4) Course may be repeated with a different topic and consent of instructor. Three hours seminar per week. Prerequisites: Consent of instructor. See departmental announcements. Topic will vary with instructor. (F,SP)

Political Theory

213. American Political Theory. (4) Three hours seminar per week. Prerequisites: 112A or consent of instructor. Basic problems of political theory will be examined within the context of American political development. (F)

214. Themes in Western Political Theory. (4) Course may be repeated for credit. Three hours seminar per week. Themes to be specified by instructor. (F,SP)

215. Contemporary Theory and Political Science. (4) Three hours seminar per week. The properties of theory—both classical and contemporary—as employed in the discipline. Theoretical selections will vary with each offering. (F)

217. Politics and Culture. (4) Three hours seminar per week. Analysis of the interrelationships of politics, personality, and culture, with special focus on American materials. Research papers will be written and discussed during the semester. (F)

218A-218B. Colloquium in Political Theory. (4;4) Three hours 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 seminar per week. Forum for the presentation of original work in political theory. (F,SP)

International Relations

220A. Theories of International Relations. (4) Three hours seminar per week. The theoretical and methodological approaches to the study of international relations. Origin, application and utility of major concepts featured in the study of international relations. (F)

220B. Theories of International Relations. (4) Three hours seminar per week. Credit and grade to be awarded upon completion of the sequence. Prerequisites: 220A. The construction of theories in the field of international relations. (SP)

221. International Organization. (4) Three hours seminar per week. Evolution of international institutions in response to changes in knowledge and international political conditions in fields such as economics, science and technology, health, education, welfare, and management of conflict as reflected in United Nations and specialized agencies, regional organizations, and common markets. (SP)

222. Nationalism and Imperialism. (4) Three hours seminar per week. Prerequisites: Consent of instructor. Three hours seminar per week. Prerequisites: Consent of instructor. See departmental announcements. Topic will vary with instructor. (F,SP)

225A-225B. International Political Economy. (4/4) Three hours 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 revolving around trade, money, resource use, technology, and physical environment. (F)

227A-227B. International Relations and Foreign Policy. (4;4) Three hours seminar per week. Prerequisites: Consent of instructor. Three hours seminar per week. Prerequisites: Consent of instructor. See departmental announcements. Topic will vary with instructor. (F,SP)

228. National Security Policy. (4) One 3-hour 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 use of military force; and present and future problems of national security. The main emphasis is on the United States. (SP)

229A. Soviet Foreign Policy. (4) Three hours seminar per week. Soviet perceptions, priorities, policy toward West and East Europe, Third World, the Sino-Soviet conflict. (F)

229B. Soviet-American Relations. (4) Three hours seminar per week. The nature of the Cold War, and the factors that facilitated the rise of detente; character and evolution of Soviet-American relations during the 1970's; the future of superpower collaboration and conflict. (SP)

Empirical Theory and Quantitative Methods

230. Political Inquiry. (4) Three hours seminar per week. Introduction to the epistemological and methodological issues that characterize political science inquiry. The processes involved in theory generation in the social sciences; the discovery, communications, confirmation, and articulation of logical, empirical normative truth claims. Research procedures in political science inquiry. (F)

231A. Quantitative Analysis in Political Research. (4) Three hours seminar per week. Prerequisites: 132A-132B or Statistics 130A. An introductory course in the analysis of political data. (F,SP)

231B. Quantitative Analysis in Political Research. (4) Three hours seminar per week. Prerequisites: 231A or equivalent. Topics from multiple-equation causal modeling and introductory econometrics, with special emphasis on procedures appropriate for political data, including survey data. (SP)

231C. Econometrics for Political Science. (4) Three hours seminar per week. Prerequisites: 231B or equivalent. Econometric theory and applications at a more advanced level than 231B. Special emphasis on multivariate and multiple equation methods and their applications. Selected topics from factor analysis, scaling theory, analysis of covariance structures, and Bayesian methods. (SP)

232. Formal Models of Politics. (4) Three hours seminar per week. Mathematical models of politics with applications to political learning, bargaining, and democratic theory. Topics from game theory, collective choice theory, and mathematical psychology. (F)

235. Introduction to Research Methods. (4) Three hours seminar per week. Overview of methods of political research. Theories, concepts, variables, hypotheses. Research design, quantitative and qualitative methodology. Basic data collection techniques. Approaches to data analysis. Provides an overview of different statistical techniques, but does not teach statistics per se. (SP)

239. Selected Topics In Methodology. (4) Course may be repeated for credit with a different topic. Three hours seminar per week. Prerequisites: Consent of instructor. See departmental announcements. Topic will vary with instructor. (F,SP)

240. The Pacific Rim. (4) Three hours 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 demilitarization. Also listed as Asian Studies 220. (SP)
Political Behavior

261. Political Behavior. (4) Three hours seminar per week. A comprehensive review of the major topics in political behavior through intensive study of the theories, findings, and proceedings of the most significant studies in the field. (F)

262. Voting Behavior and Public Opinion. (4) Three hours seminar per week. Examination of the basic literature on American voting behavior, public opinion and student research on individually selected topics in this field. (F)

269. Selected Topics in Political Behavior. (4) Course may be repeated for credit with different topic. Three hours seminar per week. Prerequisites: Consent of instructor. See departmental announcements. Topic will vary with instructor. (F,SP)

American Government and Politics

271A-271B. American Government. (4) Three hours seminar per week. Credit and grade to be awarded upon completion of the sequence. Overview of the American political system. The system in comparative perspective. Social and demographic foundations of American government and politics. The American system in light of democratic theory. (F)

272A-272B. National Policy Making. (4) Three hours seminar per week. Formerly Political Science 272. National policy-making processes, concentration on Congress, the Presidency, and interactions among policy making institutions. (F,SP)

273. Urban Politics. (4) Three hours seminar per week. Politics and policy-making in American cities. Historical, economic, and social context of urban politics; problems affecting political order and development; modernization and equity; and interstate conflict and international relations. (F)

Public Law and Jurisprudence

280A. Public Organization, Administration, and Policy. (4) Three hours seminar per week. The process of public programming, and administrative decision-making. (F)

280B. Comparative Administration. (4) Three hours seminar per week. A comparative analysis of the structures and processes which are used to control the effects of those controls on the character of administrative decision-making. (F)

280C. Public Policy and Decision Making. (4) Three hours seminar per week. The process of public policy formulation, governmental planning and programming, and administrative decision-making. (F)

281A-281B. Budgeting. (4) Three hours seminar per week. Budgeting in diverse contexts—from ancient to modern times, local, state and national government, and poor and rich countries. Topics include budgetary theory, strategies and calculations, program budgeting, state power and financial capability, decentralization, diffusion of financial norms and technology. The emphasis is on comparative analysis. (F)

Management Information Systems

282. Management Information Systems. (4) Three hours seminar per week. This course will focus on the problems of converting data into information, and the use of information in policy design and implementation. Major issues will be considered in the context of organizational theory and policy analysis. (F,SP)

Bureaucratic Politics

283. Bureaucratic Politics. (4) Three hours seminar per week. The role of bureaucratic politics in the formulation of administrative policies, including consideration of individual incentives, inter-agency relations, bureaucratic-legislative relations, bureaucratic-executive relations and the problem of democratic control. (F)

Development Administration

287. Development Administration. (4) Three hours 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 organization theory to non-Western administration. (F)

Research Topics in Public Organization

289. Research Topics in Public Organization. (4) Three hours seminar per week. Content of course will alternate between budgeting and information systems. (F,SP)

Special Studies

290. Dissertation Research. (4) Course may be repeated for credit. One 3-hour 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 designs and proposals for outside funding, field work, and writing and presenting the results of completed research. Presentations by graduate students working on their dissertations. (F,SP)

291. Experimental Course. (4) Course may be repeated for credit. Three hours seminar per week. Prerequisites: Consent of instructor. Topics, experimental in nature, will vary from year to year. (F,SP)

292. Directed Dissertation Study. (4) Course may be repeated for credit. By arrangement with faculty. Prerequisite: Consent of instructor and graduate advisor. Open to qualified graduate students wishing to pursue special study and research under direction of a member of the staff. (F,SP)

296. Directed Dissertation Research. (4-12) Course may be repeated for credit. By arrangement with faculty. Must be taken on a satisfactory/unsatisfactory basis. Open to qualified students advanced to candidacy for the Ph.D. degree. (F,SP)

299. Independent Study in Preparation for the M.A. Essay. (4-8) Credit to be awarded upon completion of the M.A. essay. Course may be repeated for credit. By arrangement with faculty. Must be taken on a satisfactory/unsatisfactory basis. Open only to qualified first-year graduate students working toward the M.A. degree. (F,SP)

602. Individual Study for Doctoral Students. (4-12) Course may be repeated for credit. By arrangement with faculty. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. May not be used for unit or residence requirements for the doctoral degree. (F,SP)

Professional Courses

398. Professional Preparation for Graduate Student Instructors. (4) Course may be repeated for credit. By arrangement with faculty. Must be taken on a satisfactory/unsatisfactory basis. Special study under the direction of a staff member with emphasis on the teaching of undergraduate courses in political science. (F,SP)
404. Research Skills. (1-4) Course may be repeated for credit. By arrangement with faculty. Must be taken on a satisfactory/unsatisfactory basis. Individual research work under supervision of faculty members. Open to students engaged in supervised research projects in Political Science. (F,SP)

Interdepartmental Studies Courses

Related Courses offered in the Program in Public and Nonprofit Management
IDS 206. Advanced Seminar in Public and Nonprofit Management. (3)
IDS 207. Managers and Management. (3)
IDS 208. Techniques of Management Control. (3)
IDS 209. Applied Microeconomics. (3)
IDS 210. Organizational Understanding for Managers. (3)
IDS 211. Public Sector Accounting. (3)
IDS 212. Financial Management. (3)
IDS 214. Strategic Management in the Public Sector. (3)
IDS 217. Technology, Tasks, and Politics. (3)
IDS 218. Information Resource Management. (3)
IDS 219. Financing Tools for Public Managers. (3)
IDS 220. Management Professionals in Organizations. (3)

For information about these and other courses related to this program, see the Public and Nonprofit Management section of this catalog.

Population Studies

(College of Letters and Science)

Office: Graduate Group in Demography, 2232 Piedmont Avenue, 642-9000

*Advisers: Mr. Hammel, Mr. Wachter, Mr. Lee.*

The Group in Demography offers an undergraduate minor in the subject of population. The minor is open to all interested undergraduate students. Please see the “Demography” listing in this catalog for a complete description of the minor. The undergraduate program in psychology is open to all undergraduate students. A listing of the faculty and description of the graduate program are given under Demography. Senior undergraduates are eligible to enroll in the graduate courses if otherwise qualified.

Lower Division Courses

*5. Seminar in Population. (2) One 2-hour seminar per week. Introduction to the study of population. History of human populations, theories about causes and consequences of population changes especially mortality, fertility, marriage, divorce and migration. Enrollment is limited to twelve students.

Upper Division Courses

100. Introduction to Population Theory. (3) Two 1½ hour lectures per week. Population structure and change in developed and developing countries, and in the past. Social and economic consequences for development, resources, employment, households, social security, etc. The influence on fertility, mortality and migration, of social, economic, technological and policy factors. (F, W, Ch)


Psychology

(College of Letters and Science)

Department Office: 3210 Tolman Hall, 642-5292
Chair: Ervin R. Hafer, Ph.D.

Professors:
- Jack Block, Ph.D. Stanford University. Personality theory, personality development.
- Joseph J. Campos, Ph.D. Cornell University. Social development of infants, perceptual development.
- Martin V. Covington, Ph.D. University of California. Problem-solving, thinking, educational infant development.
- Phippo A. Cowan, Ph.D. University of Toronto. Clinical and developmental cognitive development.
- Russell L. DeVos, Ph.D. University of Michigan. Sensory psychology, color vision.
- Stephen E. Glickman, Ph.D. McGill University. Comparative behavior in mammals.
- Ervin R. Hafter, Ph.D. University of Texas. Auditory perception and psychophysics; attention.
- Ekaterina E. Jones, Ph.D. University of California. Psychotherapy research, minority issues.
- Daniel Kahneman, Ph.D. Stanford University. Judgment, decision-making, attention.
- Geoffrey Keppel, Ph.D. Northwestern University. Experimental design and statistical analysis.
- Jonas Langer, Ph.D. Clark University. Cognitive development.
- Arnold L. Leiman, Ph.D. University of Rochester. Nervous system development, plasticity.
- Mary B. Main, Ph.D. Johns Hopkins University. Attachment, speech process, ethology.
- Joe L. Martinez, Ph.D. University of Delaware. Neurobiology of learning and memory.
- Christina Maslach, Ph.D. Stanford University. Social, health psychology.
- Gerald A. Mundelohn, Ph.D. University of Michigan. Personality development.
- William M. Meredith, Ph.D. University of Washington. Personality development.
- Charlan J. Nemeth, Ph.D. Cornell University. Social psychology.
- Donald A. Riley, Ph.D. Ohio State University. Learning in animals.
- Eleanor H. Rosch, Ph.D. Harvard University. Cognition, concepts, semantics, statistical analysis.
- Dan J. Slobin, Ph.D. Harvard University. Psycholinguistics.
- Guy E. Swanson, Ph.D. University of Chicago. Personality and development.
- Phillip E. Tetlock, Ph.D. Yale University. Social, political behavior.
- Tom R. Tyler, Ph.D. University of California. Psychology of justice, psychology of the law, political psychology.
- Rhona S. Weinfield, Ph.D. Yale University. Clinical, community, school.
- Sheldon Zedeck, Ph.D. Bowling Green University. Industrial/organizational, personnel.
- Catherine Landreth, Ph.D. (Emeritus) University of Minnesota. Personality assessment.
- Pitts H. Stowe, Ph.D. (Emeritus) Yale University. Personality development.
- Alex C. Smith, Ph.D. (Emeritus) University of California. Differentiation.

Assistant Professors:
- Alison Gopnik, Ph.D. Oxford University. Thought and language development.
- Stephen Hsu, Ph.D. University of California. Child psychology, developmental psychopathology.
- Richard Ivey, Ph.D. University of Oregon. Biological and cognitive psychology.
- Oliver P. John, Ph.D. University of Oregon. Personality theory and assessment.
- Alvin F. Zander, Ph.D. University of Michigan. Personality development.

Adjoint Professors:
- Robert A. Kelemen, Ph.D. University of California. Psychology of women; creativity.

Affiliated Professors:
- Martin Banks, Ph.D. (Optometry)
- Curtis L. Hardyck, Ph.D. (Education)
- Lonnie R. Stroebel, Ph.D. (Social Welfare)
- Elliot Turkel, Ph.D. (Education)

Visiting Professor:
- Alvin F. Zander, Ph.D. University of Michigan. Small group processes.

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, differential, industrial, quantitative, clinical, and cognitive psychology, learning (human and animal), perception, personality, and psychophysiology.

The fact that psychology is so diverse means, however, that all areas of study cannot be represented within the expertise or primary interest of a single faculty or department. This is true at Berkeley, where the student is upon entrance upon the upper division level requires 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) six one-semester courses distributed over three areas, (3) a one-semester course in statistics and methodology, and (4) additional courses to bring the upper division units completed to 28. Most students who complete the requirements (2) and (3) in the junior year, although beginning the satisfaction of either or both requirements during the sophomore year is encouraged in order to allow for flexibility of course scheduling in subsequent years. As many of the courses which may be used to satisfy requirement (2) will be more meaningful to students who have completed requirement (3), students should be encouraged to take 101 early in the major.

Students will be admitted to the major upon completion of the prerequisite courses.

The Major

Lower Division. Prerequisites may be taken on a P/NP basis and must be completed with a "passed"
grade or a letter grade of C+ or higher. 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 13 (formerly Molecular Biology 10); Molecular and Cell Biology 32 (formerly Physiology 1); Molecular and Cell Biology 61 (formerly Physiology 10); Integrative Biology 30 (formerly Zoology 10); Molecular and Cell Biology 60 or equivalent. Students should consult the department advisers for changes in these requirements resulting from the reorganization of the biological sciences.

Evolution: One course from Anthropology 1, 15, Molecular and Cell Biology 41 (formerly Genetics 10), Integrative Biology 60 or equivalent.

Social Science: Two courses from among the following: Anthropology 3 or 17; Linguistics 5; Sociology 3.

Quantitative: Statistics 2 or Psychology 5.


Note: A few courses are listed as meeting requirements in more than one area. However, if a course is used to satisfy the requirement in one area, it cannot be used for another area.


3. Additional Psychology courses to bring the total upper division units completed to 28. No more than one 108L or 108 course may be offered for completion of the major unit requirement.

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 advisor.

Honors Program. The award of departmental honors contingent upon: (1) maintenance of an overall grade-point average of 3.3; (2) achievement of a grade-point average of 3.3 in upper division psychology courses; (3) submission of a thesis of high quality prepared under the supervision of a member of the Psychology Department faculty, and marked by satisfactory completion of at least 3 units of course 199 or H195A-B. 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 regards completion of an undergraduate major in psychology or a cognate field as the best preparation for graduate study. The undergraduate program should include study in statistical methods and a laboratory in experimental psychology. The number of fully qualified applicants generally exceeds the number admitted; therefore, the prospective applicant who has little or no background in psychology is advised to defer application until appropriate undergraduate course work has been completed.

Graduate Training Programs. The graduate program is designed for doctoral students interested in pursuing advanced study and conducting original research in psychology. New admissions are restricted to candidates who have completed at least two years of graduate study. Prerequisites: Students are accepted for the fall semester only. Detailed information concerning admission, financial aid, and degree requirements is given in a brochure available from the Student Services Office, Department of Psychology, University of California at Berkeley; Berkeley, CA 94720.

Graduate training is organized around seven major areas of study. Formal graduate training, including the selection and evaluation of students and the development of the Ph.D. degree, is based on the philosophy that the major requirements of training programs is the primary responsibility of faculty members in the following areas: biological, clinical, cognitive, developmental, personality, quantitative, and social.

The second of each training program is a list of prerequisite courses. These courses are des

99. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Must be taken on a pass/no pass basis. Prerequisites: 1 or 108. Must be taken with a written proposal by the instructor of record. Intended for freshmen and sophomores who wish to undertake 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.

*107. Buddhist Psychology. (3) Two 1½-hour lectures per week. Based on tradition of direct observation of working of ordinary mind in everyday life situations as contrasted to present day theoretical constructs. Based on the theories of cognition, perception, motivation, emotion, and social interaction, and neurosis.

*108. Environmental Psychology. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 101 recommended. Survey of environmental psychology with a focus on psychological aspects of environmental perception and behavior; behavioral effects of density; psychological factors in environmental planning design.

*108L Laboratory in Environmental Psychology. (1) One 3-hour laboratory per week. Prerequisites: Concurrent enrollment in 108 and consent of instructor. Demonstrations, exercises and field projects in environmental psychology.

109. History of Psychology. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: One course in each of the three breadth areas required for the major. Development of scientific study of human and animal behavior. Consideration of history of psychological factors in environmental planning design.

Quantitative Psychology

101. Research and Data Analysis in Psychology. (4) Three 1-hour lectures and one 2-hour discussion per week. Prerequisites: 1 and completion of the quantitative prerequisites for the major or consent of the instructor. The use of data analysis and techniques in research design. Topics to be covered include experimental design, comparison of means, comparison of frequency distributions, tests of hypotheses, regression and correlation. Students will be expected to participate in data collection and its analysis. Reliability, validity and level of measurement; factorial designs and their analyses also covered. (F,SP)

104. Formal Models of Cognitive Processes. (3) Three hours of lecture per week. Prerequisites: 101. This course will introduce students to psychological models in the areas of learning, perception, psychophysics, judgment, and choice. It will cover both the theoretical underpinnings and the empirical success of signal detection theory, mathematical learning theory (e.g., Markov processes, etc.), game theory, probabilistic models of choice, expected utility theory, and connectionist models, among other topics. (SP)

*105. Introduction to Multivariate Psychological Experimentation. (4) Two 1½-hour lectures and one 1½-hour discussion per week. Prerequisites: 1 or consent of instructor. General techniques for analyzing psychological experiments yielding multiple measurements of observations. Emphasis on multivariate prediction methods, factor and component analysis,
discrimination and classification, multivariate analysis of variance, and latent class and structural analysis.

*106. Topical Seminars in Quantitative Psychology. (3) Two-hour lectures and one 1-hour discussion per week. Prerequisites: Consent of instructor. A precise schedule of offerings check with the Student Services Office each semester.

*106A. Test Theory. (Prerequisites: 104 recommended.

*106C. Psychological Scaling. (3) Prerequisites: 104 and 105 recommended.

*106E. Decision Making. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 101. This course focuses on empirical and theoretical studies of individual decision-making; basic concepts in measurement and decision modeling and descriptive and normative models of decision-making under certainty, uncertainty and risk. Examples of discussion topics include preference judgments, evaluations of alternatives, probabilistic choice, and Bayesian inference.

*106F. Research Design and Analysis. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101 or instructor's approval. An in-depth examination of research design in psychological and sociological contexts, including consideration of within-subjects designs, with special emphasis on the inter-relationship between research design and statistical analysis.

Biological Psychology

*110. Introduction to Biological Psychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 1 and biological prerequisites for the major or consent of instructor. Survey of relations between behavioral and biological processes. Topics include sensory and perceptual processes, neural maturation, natural bases of motivation, and learning.

*111. Sensory Processes: Vision. (3) Two 2-hour lectures per week. Prerequisites: 110 or consent of instructor. Examination of various aspects of visual perception (adaptation, brightness and color vision, binocular vision, object detection) in relation to anatomy and physiology of the visual system.

*111L. Laboratory in Vision. (2) Two 2-hour laboratories per week. Prerequisites: Concurrent enrollment in 111 and consent of instructor. Various experiments carried out to illustrate and reinforce observations of physiological studies of single cell responses.

*112. Sensory Processes: Hearing. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: Completion of biological prerequisites for the major or consent of instructor. Course in mammalian physiology recommended. A consideration of the biological clocks that generate daily, lunar, seasonal and annual rhythms in various animals including people. Course covers a broad range of topics related to the psychology of hearing and the physiology of the auditory system.

*113. Biological Clocks: Physiology and Behavior. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: Completion of biological prerequisites for the major or consent of instructor. Course in mammalian physiology recommended. A consideration of the biological clocks that generate daily, lunar, seasonal and annual rhythms in various animals including people. Course covers a broad range of topics related to the psychology of hearing and the physiology of the auditory system.

*114. Biology of Learning and Neural Plasticity. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 110 or consent of the instructor. A study of theoretical and experimental investigations of the biological substrates of learning, memory and forms of neural plasticity related to the growth and maturation of the nervous system.

*115. Introduction to Comparative Psychology. (3) Students who have taken Integrative Biology 145 or IDS 122 will receive no credit for 115. Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 1. Studies of animal behavior in evolutionary perspective, including analysis of behavior development, reproduction, aggression, territoriality.

*116. Hormones and Behavior. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: Completion of biological prerequisites for the major and consent of the instructor; a course in mammalian physiology recommended. Neural and endocrine mechanisms underlying behavior, especially reproduction and the process of sexual differentiation of the endocrine system will be emphasized. Hormonal influences on feeding, byrothyncs and aggressive behavior.

*117. Biological Psychology and Problems of Human Dysfunctions. (4) Two 1½-hour lectures and one 1-hour discussion per week. Prerequisites: 110 and consent of instructor. A survey of current psychological approaches to problems of human disabilities including mental disorders, behavior changes following human brain injury and disease, and mental diversity. Emphasis on nervous system models of these problems and areas of potential application of basic research development.

*118. Topical Seminar in Biological Psychology. (3) Course may be repeated for credit with a different topic and with consent of instructor. One 3-hour meeting per week. Prerequisites: Consent of Instructor. For a precise schedule of course work check with the Student Services Office each semester.

*119. Drugs and Behavior. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 110 or consent of instructor. A survey course exploring the basic principles of psychopharmacology. The major focus of the course is on the relationship between behavior and the physiological actions of drugs. Emphasis will be placed on effects of pharmacological agents on mental processes such as attention, motivation, learning and memory.

For additional courses in biological psychology, please see IDS listings following the graduate psychology courses.

Cognitive Psychology

*121. Animal Cognition. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 1 and 5 or Statistics 2. Consideration of a range of topics concerned with the processing, organizing, and retention of information by animals; conditioning and learning in animals; symbolic processes and representations of information by animals. Species comparisons of cognitive approach processes; evolution of cognition.

*122A. Introduction to Human Learning and Memory. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 101 is recommended. Theoretical and experimental analysis of human learning and memory; short-term and long-term memory; coding and retrieval processes; transfer and interference; mechanisms of forgetting.

*122B. Advanced Topics in Human Learning and Memory. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 122A or consent of instructor. 101 is recommended. Detailed analysis of special problems in human learning and memory.

*123. Concepts and Categories. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: Consent of instructor; 101 recommended. The course 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 comparisons.

*124. Psycholinguistics. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: Consent of instructor. An introduction to linguistics or consent of instructor. Introduction to psycholinguistics, emphasizing effects of psychological variables on the learning and use of language. Influences of language behavior on psychological processes; special attention to psychological applicability of modern linguistic theory to social psychological aspects of language behavior.

*125. Second Language Learning and Bilingualism. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: Background in linguistics and psychology recommended. Process and structure in second language acquisition, development of "inter-languages." Processing of linguistic information by bilinguals (perception, recall, translation); structure of bilingual cognitive processes.

*126. Perception. (3) Two 1-hour lectures and one 1-hour 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 psychophysical and physiological mechanisms of perception and applications to human behavior.

*127. Cognitive Neuroscience. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 101 or IDS 120. Location of the parts of psychological models in the brain. Functional mapping of the brain.

*128. Topical Seminars in Cognitive Psychology. (3) Course may be repeated for credit with a different topic and permission of the instructor. One 3-hour seminar per week. Prerequisites: Consent of instructor. For a precise schedule of offerings check with the Student Services Office each semester.

Clinical Psychology

*130. Clinical Psychology. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 1. Theoretical and empirical approaches to the explanation of psychological dysfunction. The relation between theories of psychopathology and theories of intervention. A critical evaluation of the effects of individual, family, and community approaches to therapeutic and preventive intervention. Thematic focus of the course may change from year to year. See department notes for details.

*132. Community Psychology. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 130 or consent of instructor. Study of mental health problems from a social psychological perspective, with particular concern for ecological, epidemiological and sociological factors. Critical examination of emerging methods of community intervention, including prevention.

*133. Minority Mental Health. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 130 or consent of instructor. Overview of concepts and research findings relevant to understanding and contributing to the solutions of the particular mental health problems of ethnic minority communities. Will be offered every other year.

*134. Field Experience in Clinical and Social Change. (3) Course may be repeated for credit. One 1-hour lecture, five hours field work per week. Prerequisites: 130 or consent of instructor. Conceptual overview and small group discussion of issues involved in mental health work. Students must be involved in at least 5 hours of work per week in a mental health setting approved by the instructor. In a given semester, a specific focus may be adopted for the course. Check with the Student Services Office each semester.

*138. Topical Seminars in Clinical Psychology. (3) Course may be repeated for credit with a different topic and consent of instructor. One 3-hour seminar per week. Prerequisites: 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 1-hour lectures and one 1-hour discussion per week. Prerequisites: 1. Survey of theory and research in developmental psychology with emphasis upon changes in behavior throughout the life span, including prenatal development.

*141. Development during Infancy. (3) Two 1-hour lectures and one 1-hour discussion per week. Cogni-
Social Psychology

160. Social Psychology. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 1. Survey of social psychology including interaction processes, small groups, attitudes and attitude change, and social psychology. Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 160 or consent of instructor. Theory and research in interpersonal dynamics including such topics as aggression, altruism, attraction, and conformity.

161. Interpersonal Processes. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 160 or consent of instructor. Theory and research in interpersonal dynamics including such topics as aggression, altruism, attraction, and conformity.

162. Attitudes, Beliefs, and Influence Processes. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 160 or consent of instructor. Theory and research in interpersonal dynamics including such topics as aggression, altruism, attraction, and conformity.

163. Small Group Structure and Processes. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 160 or consent of instructor. Social psychological theories and research methods in the area of small groups.

165. Language in Social Interaction. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: Background in linguistics and psychology recommended. Variation in linguistic features, register, style, dialect and language in interaction, in relation to social features of participants and situation. Analysis of social rules, and strategic use to convey social meaning.

166. Socialization and Personality. (3) Three hours of lectures per week. Prerequisites: 1. Development and change in personality as a result of socialization in the family and in wider social relations from childhood through the middle years.

168. Topical Seminars in Social Psychology. (3) Course may be repeated for credit with a different topic and consent of instructor. One 2-hour lecture and one 3-hour laboratory per week. Prerequisites: Consent of instructor. For a precise schedule of offerings, check the Student Services Office each semester.

171. Psychology of Abilities and Aptitudes. (3) Two 1½-hour lectures per week. Prerequisites: 101 or equivalent course. Theory and evaluation of the principal tests of abilities and aptitudes. Historical development of psychological test methods.

Industrial-Organizational Psychology

180. Industrial-Organizational Psychology. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 101 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 the processes involved in developing and maintaining organizations.

Personality Psychology

180. Psychology of Personality. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 1. A consideration of general and systematic issues in the study of personality and an evaluation of major theories and points of view.

151. Assessment of Personality. (4) 3 hours of lecture and 2 hours of laboratory per week. Prerequisites: 150 and consent of instructor. Theoretical and methodological issues in the assessment of personality; observational procedures; the interview; problems of test interpretation and psychodiagnosis; demonstration and exercises in the methods of personality assessment.

153. Stress and Adjustment. (3) Two 1-hour lectures and one 1-hour discussion per week. Prerequisites: 150 and consent of instructor. Examines stress theory and research from clinical field and laboratory settings dealing with the physiological issues involved in adjustment to life stresses.

158. Topical Seminars in Personality. (3) Course may be repeated for credit with a different topic and consent of instructor. One 2-hour lecture and one 3-hour laboratory per week. Prerequisites: Consent of instructor. For a precise schedule of offerings check with the Student Services Office each semester.

159. Laboratory in Personality Research. (3) One 2-hour lecture and one 3-hour laboratory per week. Prerequisites: 101 and consent of instructor. Students are expected to read an article each week and actively participate in the discussion with the speaker.
most common designs found in psychology experiments. 201B is a continuation of 201A and covers the design and analysis of more complicated experimental designs.

*205A-205B. Data Analysis. (3;3) Three hours lecture and one 2-hour discussion/lab per week. Students will need to work through problems (homework). A general data analytic course that emphasizes design issues. Development of latent trait and item response theory by way of standard models that are associated with the normal ogive, logistic, etc. Laserfeld's latent trait models will be discussed as will be special topics in the field. Tailored testing will be introduced.

*208C. Psychological Scaling. (3) Two 1½-hour lectures per week. An introduction to the measurement of psychological value. Emphasis will be placed on psychological judgment. Topics will include Weber's Law, Fechner's Law, Thurstone scaling, signal detection theory, debates on the use of category ratings vs. magnitude estimation, the ratio-difference controversy, cross modality matching, theories of contextual effects.

*208D. Multidimensional Scaling. (3) Three hours of lecture per week. This course will cover the fundamental underpinnings of multidimensional scaling together with numerous applications in psychology and marketing. The first part of the course will be devoted to geometric distance models of similarity judgment, the second part will cover individual-difference models, and the third part will be devoted to multidimensional models of preference data. Students will have the opportunity to use many existing programs and gain first-hand experience.

*209G. Introduction to Linear Models. (3) Two 1½-hour lectures per week. This course will be primarily concerned with correlation, regression, and related topics (e.g., the use of dummy coding, trend analysis, relations to factor analysis and analysis of variance, problems in interpretation). The course will also provide an introduction to path-analysis and linear structural equations models.

209. Quantitative Seminar. (1) Course may be repeated for credit. One 1½-hour meeting per week. May be taken as an advisor and other graduate students. Prerequisites: Consent of instructor. Reports and discussions of original research in the area of quantitative 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 quantitative graduate program. (F,SP) Staff

Biological Psychology

210A-210B. Graduate Survey of Biological Psychology. (4;4) Two 2-hour lectures per week. Prerequisites: Consent of instructor. A two-semester survey of the field of biological psychology. Both semesters are required for the comprehensive study of biological psychology. Other graduate students may take either or both semesters for credit. First semester covers basic and sensory processes; second semester is concerned with learning, neural plasticity and ethology. (F,SP) Staff

*211. Hormones and Behavior. (3) One 3-hour meeting per week. Prerequisites: 210A-210B. A consideration of the influence of hormones on reproductive behavior and the control of the sexual differentiation. Discussions of parental behavior, seasonal reproduction and hormonal involvement in non-reproductive processes, including eating, social behavior, learning and memory. Emphasis on mammals.

*212. Biological Clocks and Animal Behavior. (3) One 3-hour meeting per week. Prerequisites: 210A-210B. Formal models of entrainment and generation of circadian rhythms. Consideration of the role of circadian processes in photoperiodic time measurement and on seasonal reproductive cycles. Discussion of chemical and genetic processes for generation and entrainment of biological rhythms.

*217. Drugs and Behavior. (3) One 3-hour lecture per week. Prerequisites: 210A-210B. This course attempts to explain how drugs influence behavior. Principles of pharmacology, cytology of nerve cells, neuropsychological and physiological functions are emphasized. The anatomy, neurochemistry and pharmacology of neurotransmitter systems are reviewed. The actions of drugs on psychopathological conditions will be studied. Finally the course will focus on the effects of drugs on complex behaviors such as motivation, cognition, learning and memory.

*218. Research Reviews on the Biological Basis of Cognition and Learning. (1) Course may be repeated for credit. One 1-hour 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 repeated for credit. One 1½-hour meeting 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 biological 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 biological graduate program. (F,SP) Staff

Cognitive Psychology

*220A. Proseminar: Cognition. (3) One 3-hour lecture per week. 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 comparisons.

*220B. Proseminar: Conditioning and Discrimination Learning. (3) One 3-hour lecture per week. Classical and instrumental conditioning and discrimination learning, with material taken both from human and animal literature, but with emphasis on the animal work.

*220C. Proseminar: Human Learning and Memory. (3) One 3-hour lecture per week. Theoretical and experimental analysis of human learning, transfer, and memory. Stress will be given to the learning and retention of verbal materials.

*220D. Proseminar: Problem Solving. (3) One 3-hour lecture per week. Principal theoretical constructs and experimental procedures in visual and auditory perception. Topics will include convergent and divergent thinking, computer simulation, and the measurement and training of problem solving effectiveness.

*220E. Proseminar: Perception. (3) One 3-hour lecture per week. Principal theoretical constructs and experimental procedures in visual and auditory perception. Topics will include perception, categorization, color, space, shape, and motion, pattern recognition, and perceptual attention.

229. Cognitive Seminar. (1) Course may be repeated for credit. One 1½-hour meeting 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 cognitive psychology. Not all participants must report in any given semester, but all are expected to attend and to enter into the discussions. Required course for all students in the cognitive graduate program. (F,SP) Staff

Clinical Psychology

*226. Proseminar: Clinical Psychology. (3) One 3-hour lecture per week. Examination of major theoretical and historical themes in the development of modern clinical psychology, with special attention to concepts of mental health and psychopathology, models of intervention and clinical research, and emerging professional roles and institutions.

*231A. Clinical Psychopharmacology. (3) One 3-hour lecture per week. The interaction between psychological and physiological factors with particular emphasis on the interplay between psychopharmacology and clinical psychology. Topics to be covered include structure, function and measurement of the autonomic nervous system; fundamental psychopharmacological concepts and models; human emotion; stress; psychopharmacological disorders; psychobiological substrates of personality and psychopathology; social psychopharmacology, and applied psychopharmacology.

*231B. Clinical Issues in Neuropsychology. (3) One 3-hour lecture per week. Examination of neuroanatomical and neuropsychological issues related to neuropsychological and psychiatric disorders. Topics will include neuropsychological assessment, clinical test batteries, neurologically related emotional disorders, child neuropsychology, and therapeutic approaches to brain injury. A basic understanding of brain organization and function will be provided.

231C. Assessment of the Child in the Family and School. (3) One 3-hour lecture per week. An introduction to the clinical methods of assessing children in the context of their family and school settings.

231D. Minority Mental Health. (3) One 3-hour lecture per week. Overview of concepts and research findings relevant to understanding, and contributing to the solution of the particular mental health problems of ethnic minority communities.

*231E. Expectations and the Prevention of School Failure. (3) One 3-hour lecture per week. Examination of the theory and research on expectancy processes in the classroom and in schooling, with particular focus on classroom and school practices which enhance the social processes of instruction and promote the development of competence in children.

233A-233B. Laboratory in Clinical Assessment. (2;2) One 2-hour discussion per week. Credit and grade to be awarded upon completion of the seminar. Prerequisites: First year status as graduate student in clinical psychology or consent of instructor. The clinical interview and principles and methods of intellectual, objective, and projective clinical assessment. Readings, discussion, and supervised experience in clinical assessment. Required of all clinical students. (F,SP) Staff

*234A. Theories of Psychotherapy. (3) One 3-hour lecture per week. Examination of the major theories of psychotherapy and personal change. Orientations that have received the most psychoanalytic approaches, behavioral and cognitive-behavioral techniques, the humanistic schools, and systems theory.

*234B. Theories of Child and Family Therapy. (3) One 3-hour lecture per week. Analysis of major approaches to promoting developmental change in children, couples and families. To be offered every other year.

*234C. Theories of Community Intervention. (3) One 3-hour lecture per week. Examination of theory and research underlying social and community approaches to the promotion of mental health and the prevention of dysfunction. Analysis of the methods of intervention, with a special focus on consultation.

235. Clinical Research. (3) One 3-hour lecture per week. Strategies of research in clinical issues; clinical methods of gathering and interpreting data; case examples from the research in progress of participants in the seminar.

237A. Intervention: Adult Psychotherapy. (1) Course may be repeated for credit. One 1-hour meeting per week. Prerequisites: Limited to second and third year clinical psychology students or consent of instructor. Psychological intervention with adults. (F,SP) Staff

237B. Intervention: Child and Family Therapy. (1) Course may be repeated for one-hour credit. Prerequisites: Limited to second and third year clinical psychology students or consent of in-
Personality Psychology

250A. Perspectives in Personality: Overview. (3) One 3-hour lecture per week. Introduces the perspectives and research programs of the personality faculty 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 program.

250B. Perspectives in Personality: Trends and Issues. (3) One 3-hour 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, and (4) personality systematics; (5) personality development and concepts of structure, and (6) formulation of personality-system-social-system interactions.

250C. Perspectives in Personality: Stress and Coping Processes. (3) One 3-hour lecture per week. Explores the ways stress and coping processes affect health, functioning and morale as reflected in current models and research. Focuses on human psychological studies of coping and adaptation. Occasionally may deal with theories of affect and its links to cognition.

250P. Principles and Pragmatics of Personality Measurement. (3) One 3-hour lecture per week. Methodological aspects of personality measures expected to be attended and to enter into the discussions. Required for all students in the clinical psychology graduate program. (F,SP)

Developmental Psychology

240A. Proseminar: Biological and Perceptual Development. (6) Three hours of lecture per week. Survey of the biology of the nervous system and behavior; the cellular interactions during development in animals and humans, including neurogenesis, synaptogenesis, cell death and synapse elimination; perception, 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.

240B. 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, familial, and cultural factors affecting socioemotional development through childhood and adolescence. Focus includes how normal or pathological trajectories are maintained in some children, while others shift into or out of clinically diagnosable disorders. (SP)

240C. Proseminar: Development in Infancy. (3) Three hours of lecture per week. Theory and research on cognitive and social development during the first two years of life. Specific areas of focus are: (1) learning, memory, and categorization; (2) social interaction; and (3) attachment theory, including variables related to individual differences in attachment organization. (F)

240D. Proseminar: Cognitive and Language Development. (3) Three hours of lecture per week. Theory, research, and methods of the processes and structures of intellectual growth from birth to adulthood. Specific areas of focus include conceptual, metacognitive, psycholinguistic, and sociolinguistic development. (SP)

249. Developmental Seminar. (1) Course may be repeated for credit. One 1-hour lecture 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 psychology graduate program. (F,SP) Staff

Social Psychology

260A-260B. Proseminar Course in Social Psychology. (3,3) One 3-hour lecture per week. Extensive coverage of the 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. (F,SP)

261. Research Methods in Social Psychology. (3) One 3-hour lecture per week. Survey of various research methodologies that have been developed for studying human social behavior, including experimental methods, self-report methods, and content analysis. Required course for all students in the social psychology graduate program.

269. Social Seminar. (1) Course may be repeated for credit. One 1-hour lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. Reports and discussion of original research in the area of social psychology. Not all participants need report in any given semester, but all are expected to attend and to enter into the discussions. Required for all students in the social psychology graduate program. (F,SP) Staff

Special Course Offerings

290. Seminars. Course may be repeated for credit. One 2-hour meeting per week. (F,SP) Staff

*290A. Measurement. (2)
*290B. Biological. (2)
*290C. Comparative. (2)
*290D. Learning. (2)
*290E. Perception. (2)
*290F. Thinking. (2)
*290G. Language and Communication. (2)
*290H. Developmental. (2)
*290I. Personality. (2)
*290J. Social. (2)
*290K. Clinical. (2)
*290M. Industrial. (2)
*290N. Analysis of Variance Techniques. (2)
*290P. Additional Seminars on Special Topics To Be Announced. (2)

298. Directed Study. (1-12) Course may be repeated for credit. Individual conference. Special study under the direction of a member of the staff. (F,SP)

299. Research. (1-12) Course may be repeated for credit. Individual conferences. Individual research. (F,SP)

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

Professional Courses

*300. Seminar in the Presentation and Teaching of Psychological Material. (1) Course may be repeated for credit. One 1-hour lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Advancement to candidacy; limited to clinical psychology graduate students or consent of instructor. Individual programs of practice and supervision in approved off-campus agencies. (F,SP)

Interdepartmental Studies Courses

Upper Division Courses

*IDS 122. Animal Behavior. (3) Three hours of lecture, one hour demonstration, plus one hour discussion per week. Prerequisites: Biology 1A-1B or 11, or Entomology 100/ Molecular and Cell Biology 102 strongly recommended. An introduction to comparative animal behavior and behavioral physiology from evolutionary perspective, including analysis of behavior, genetics and development, learning aggression, reproduction, adaptiveness, physiological substrates. Sponsoring departments: Integrative Biology, Psychology and Entomology.

*IDS 123. Animal Behavior Laboratory. (3) Course may be repeated for credit. One 1-hour lecture, one 3-
Aim of broadening both their experience and the scope in government or nonprofit organizations. The program offers a number of core courses, listed below, and serves as a springboard to create students of related courses in a variety of departments and schools. The program does not award degrees. However, some of the core courses may be used by participating schools or departments to meet their own degree requirements. The participating units are Business Administration, Education, Library and Information Studies, Public Health, Public Policy, Social Welfare, City and Regional Planning, and Political Science.

A list of related courses is contained in the "Graduate Student's Guide to Courses," available from the Department of City and Regional Planning, 228 Wurster Hall, University of California at Berkeley, Berkeley, CA 94720, 642-5256.

Graduate Courses

IDS 204. Animal Behavior Research Reviews. (1) Course may be repeated for credit. One 1½-hour seminar per week. Prerequisites: Consent of instructor. Students will present summaries of the literature on animal behavior in an identifiable domain. The purpose of this course is to promote interdisciplinary dialogue among researchers in the field of animal behavior.

IDS 232A-232B. Understanding Families: Methods in Family Research. (1, 1) Two hour seminar every other week. Prerequisites: Consent of instructor. The seminar will focus on the relation between theory and method in understanding family structure and function. It will examine historical, cultural, and psychological perspectives on family organization and nontraditional families, and focus on the systems as they change over time. Attention is given to processes within the family and to the connections between the family and other social institutions. Methods for understanding the role of the family in both normal and dysfunctional development will be evaluated.

IDS 236. Cognitive Science Research Discussion. (1) Course may be repeated for credit. One 1½-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of student or instructor. This course is based on the Cognitive Science R.A. for one of the professors associated with the Cognitive Science Program. The students will work on the research of the course and present their research at a seminar meeting.

IDS 237A-237B. Cognitive Science Seminar. (1, 1) One 1½-hour lecture and one 1½-hour discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Weekly presentations by leading cognitive scientists on a range of topics in Cognitive Science, with discussing discussion. Sponsoring departments: Electrical Engineering and Computer Sciences, Linguistics, Philosophy and Psychology.

IDS 271. Seminar in Neuropsychology. (3) Course may be repeated for credit. One 3-hour lecture and one 2-hour laboratory per week. Lectures and case presentations in neuropsychology. Discussion of problems of cognitive and information processing manifested in cases of aphasia, delirious dementia, traumatic injury, and other forms of neurological damage. Case presentations of patients alternate with discussions of research strategies for evaluation of cognitive functions. Prerequisites: Graduate students in psychology are opportunities for the study of cognitive, neurological, and psychological abnormalities. Sponsoring departments: Education and Psychology.

Public Health

Office of the Dean (642-2625) and Admissions (642-6531): Earl Warren Hall

The following sections have been established for courses 197, 198, 199, 295, 296, 297, 298, 299, 601, and 602. The courses may be repeated for credit, but some sections may not be given every semester.

A. Health Policy and Administration
B. Maternal and Child Health
C. Public Health Education
D. Behavioral Sciences
E. Public Health Nutrition
F. Environmental Health Sciences
G. Biostatistics
H. Epidemiology
I. Biomedical Sciences
J. Biostatistics/Biostatistics M.P.H. Program
K. Forensic Science

Programs

For a description of programs in public health, see page 87.

Schoolwide Public Health Courses

Graduate Courses

IDS 217. Technology, Tasks and Politics. (3) Three hours of seminar per week. This course examines the nature of tasks and technologies used by public sector agencies over time, affecting the character of managerial work and the politics of the policy setting. The class examines theories of effective public management and case studies of situations that require managerial initiative. Cases will be chosen from many policy areas, including public health, childcare policy, social service delivery, and regulatory policy.

IDS 218. Information Resource Management. (3) One 3-hour seminar per week. This course studies management issues surrounding data processing, communications and office automation. Using case studies, it explores managerial strategies in planning, policy and organizational issues in the context of current and future technology. (SP) Ober

IDS 219. Financing Tools for Public Managers. (3) One 3-hour seminar per week. This course will examine new financing tools in California and financing options available to public managers. Emphasis will be on a case study approach with the participation of leading finance officers and underwriters in California. The course will also discuss economic development aims and consider whether these aims can be achieved without significantly expanding the size of government. (SP) Staff

IDS 220. Management of Professionals in Organizations. (3) One 3-hour lecture per week. The history and concept of professional roles. Professionalization as an alternative to bureaucratic. Adapting supervision and evaluation to fit professional norms. Professional governance structures. Motivating professionals. Professional control and responsibility. Codes of Ethics. (F) Benveniste
mary care services will be presented with emphasis on the needs of the community and the constraints within the American Health Care System. Skills necessary for COPD such as making a community diagnosis, epidemiologic techniques, and data base retrieval systems, will be presented with specific examples. Visitors working in this area will present their current research. Students will be asked to work in teams to develop a COPD project proposal.

288. An Overview of the Aids Epidemic. (3) Course may be repeated for credit. Two 1/2-hour lectures per week. Prerequisites: Prior or concurrent enrollment in BEHS 160 or consent of instructor. This course examines the epidemic of AIDS from biomedical and social perspectives, including the psychology, virology, pathophysiology, natural history, transmission and future trends will be described. Social Science issues including the psychological, sociological, anthropological, legal, ethical, economic and health policy ramifications will be presented. The response of the government and private sectors, and of several impacted communities, will also be explored. (SP) Staff

294. Preventive Medicine Residency Program. (1-6) Course may be repeated for credit. One 2-hour seminar per week. Prerequisites: Acceptance into Preventive Medicine Residency Program. One 2-hour seminar per week with additional credits for supervised experience in public health and/or preventive medicine settings with presentation and discussion of academic concepts in relation to practical issues in public health and professional practice in preventive medicine. (F-SP) Smith

Public Policy
Graduate School of Public Policy
Office: 2607 Hearst Avenue, 442-4670
Dean: Eugene Smolensky, Ph.D.
Professors:
Eugene Bardach, Ph.D. University of California at Berkeley. Regulation, implementation, social theory
John W. Elwood, Ph.D. Johns Hopkins University. Policy process, public budgeting, organizational behavior
James F. S. Frieden, Ph.D. Yale University. Applied microeconomics, public sector decision-making
David L. Karp, LL.B. Harvard University. Law, politics, education, gender
Barrett McGuire, M.A. University of Chicago. Energy, public policy, social policy, cost-benefit analysis
John M. Quigley, Ph.D. Harvard University. Microeconomics, public finance
Richard Schaeffer, Ph.D. New York University. Health economics, health policy, nonprofit organizations
Suzanne Scottthem, Ph.D. University of California at Berkeley. Fiscal policy, public finance, cost-benefit analysis, welfare economics
Allan P. Snider, F.D. Harvard University. Political scientist, policy process, social policies
Percy H. Tarranbaum, Ph.D. University of Illinois. Telecommunication policy, new technology, mass media, social research methodology
David A. Trow, Ph.D. Columbia University. Comparative higher education, research design and analysis, professionalism
Aaron Wildavsky, Ph.D. Yale University. Political culture, budgeting, implementation
Arnold J. Zeitlin, Ph.D. (Emeritus)
Assistant Professor:
Jane Mauldon, Ph.D. Princeton University. Health policy and economics, urban planning, demography
Associate Adjunct Professor:
Kenneth T. Smith
Affiliated Faculty:
Martin Landau (Hong Kong Project)

Programs
For a description of programs in public policy, see page 88.

Lower Division Courses
6. Freshman-Sophomore Seminar. (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. Examine a variety of current public policy problems in the political, social and/or economic areas, and propose solutions to them, e.g., reforms of the political process, racial or gender equity. Attention will be paid to both the substance of the policy problem and ways to evaluate alternative solutions. Topics will vary from year to year. Open to freshmen and sophomores. Consult the Freshman Seminar brochure for current topics. (SP)

Note: Students interested in Public Policy 6 must talk to instructor before course registration.

*10. Contemporary Policy Issues and Controversies. (3) One hour lecture and 1/2 hour discussion twice a week. Considers a variety of public policy problems dealing with the design and operations of the political process, equal opportunity for minorities and women, and a range of social issues. Emphasis is on both the substance of the policy and in the development of skills in defining, analyzing and resolving policy conflicts. Class discussion is an integral part of the course.

*38. Seminar in American Higher Education. (3) Two 1/2-hour seminars per week. Freshman-Sophomore Seminar. This course will trace the evolution of the modern American university from its medieval and colonial origins. Special attention will be given to its institutional problems and challenges, and to the patterns of student life and subcultures.

Upper Division Courses

*101. Current Issues in Public Policy Analysis. (3) Two 1/2-hour lectures per week. Prerequisites: Economics 1 equivalent. Formerly 176. A critical review of differing schools of public policy thinking with respect to various issues, e.g., consumer protection, energy and resources, mental health and safety regulation. Bardach

160. Civil Rights, Courts and the Policy Process. (3) Two 1/2-hour lectures per week. An examination of the role of judges and courts in making policy about civil rights. Actual court decisions and records will be reviewed to determine what a civil right is, to see how cases get involved in civil rights, and to consider the limitations on courts as policymakers in this area, and to discuss how judges and courts could be more effectively related to the making of civil rights policy. (F)

*101. Policy on Inner-City Poverty and Unemployment. (3) Two 1/2-hour lectures per week. Examines problems of inner-city poverty and unemployment by reviewing how perceptions of these social problems have changed, the policy-making process in this area, and past and present policy responses to the problems. More effective policies are drawing on a mix of local experiences and national perspectives, will be considered.

162. Women's Rights and Public Policy. (3) Two 1/2-hour lectures per week. This course will analyze key issues raised by the contemporary feminist movement, and their impact on national and state policies. Policy areas to be covered include civil liberties and economic equity. (F,SP)

163. strategies in Using the Governmental Process. (3) Two 1/2-hour lectures per week. Explanation of strengths and limits of a predominant reliance on different parts of the governmental process - executive, legislative, judicial, bureaucratic, media or special interest groups - in trying to resolve current social/economic policy problems. Policy conflicts in such areas as welfare, abortion, child care, two-tier wages, comparable worth, minimum wage, frandgate and confirmation of Supreme Court Justices, will be examined. (F)

164. Impact of Government Policies on Poor Children and Families. (3) Two 1/2-hour lectures per week. 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 support programs, housing, health care, and child abuse. (F) Mauldon

165. Women's Rights and the Economy. (3) Two 1/2-hour lectures per week. Deals with gender equity since suffrage. Examines correlations between economic strength and limits of a predominant reliance on different parts of the governmental process - executive, legislative, judicial, bureaucratic, media or special interest groups - in trying to resolve current social/economic policy problems. Policy conflicts in such areas as welfare, abortion, child care, two-tier wages, comparable worth, minimum wage, frandgate and confirmation of Supreme Court Justices, will be examined. (F,SP)

166. Science and Technology Policy: Values in Conflict. (3) Three 1-hour lectures per week. This course examines science and technology policy from the perspective of values including political ideology, a scientist's personal values, or societal values.
ence and technology policies in several countries will be examined, as well as specific issues including nuclear technology, the computer revolution, and biotechnology. (SP)

167. Regulating New Technologies. (3) One 3-hour session per week. This course is designed to provide the student with a basic understanding of the political and economic reasons for traditional regulation, the regulators themselves, and the regulatory process. It introduces the student to new public policy issues in a variety of industries which are driven by changes in technology. These issues question the institutions responsible for regulation and ask whether the institutions and traditional tools are capable of guiding public policies in the future.

168. Political Communications and Public Policy. (3) Two 1 ½-hour seminars per week. Prerequisites: Open only to students in the Graduate School of Policy. This course is designed to enhance the student's political and policy "messages" across and outside the media to interpret what government press relations offices, media news selection (and news making), and the rush to news judgment. Case studies—press coverage of the neutron bomb and an inside look at a policy office—will be the primary reading and the focus of major written assignments. (F)

169. Contemporary Issues in the American Political Economy. (3) Two 1 ½-hour lectures per week. Prerequisites: Economics 1 or equivalent. Examines several major economic issues of the 1980s, including supply-side federal deficit and its implications; new technologies and their influence on growth and employment; the changing distribution of income; and recent trends in social policy. The course will emphasize a nontechnical understanding of the economic issues involved, as well as the historical and political background of these problems.

171. Educational Governance and Policymaking. (3) Two 1 ½-hour lectures/discussion per week. Examines how educational policy gets made and who benefits. How are education vouchers, desegregation, teacher collective bargaining and financing public schools discussed. These cases illustrate the elements of policymaking including formulating issues, use of social science data, anticipating implementation problems.

173. Acquired Immune Deficiency Syndrome (AIDS) and Public Policy. (3) Two 1 ½-hour lectures per week. AIDS poses important and pressing challenges for nontraditional responses by public policy. This course focuses on such questions: What have policy responses been influenced by the fact that most victims belong to socially disfavored groups? What local public health strategies concerning education, public education and administration of AIDS antidotes are accepted or rejected and the political and bureaucratic environment of policy advising. It explores advising by examining domestic and foreign policy issues.

174. Issues in Environmental Policy. (3) Two 1 ½-hour lectures per week. Prerequisites: An introductory course in economics. An exploration of American regulatory and administrative processes for promoting environmental quality. How do political, economic, legal, and institutional factors shape current approaches to environmental regulation? How are students to politically understand the issues? Have policy responses been influenced by the fact that most victims belong to socially disfavored groups? What local public health strategies concerning education, public education and administration of AIDS antidotes are accepted or rejected and the political and bureaucratic environment of policy advising. It explores advising by examining domestic and foreign policy issues. (F)

175. Making Legislative Policy. (3) One 3-hour lecture per week. Practical factors influencing governmental action in Sacramento. Effect of constituents, lobbyists, the media, the Administration, local government, and legislative management on legislation. Diversity in policy issues across international and social issues, the current tax revolt and the budget process.

177. Quantitative Approaches to Policy Analysis. (3) Two 1 ½-hour lectures per week. Introduces students to a set of quantitative tools used in examining policy issues and discusses what constitutes an appropriate role for analysis in policymaking. Techniques cover inferential and descriptive statistics, causal modeling, and cost-benefit analysis. Case studies present students with realistic problems and examples.

178. Public Policymaking Issues in California: Applying Concepts. (3) One 3-hour lecture per week. This course examines public policymaking in California by applying concepts such as advocacy, analysis; incrementalist vs. pluralist decisionmaking leadership, and centralization/decentralization of structural to the topologies of education, health, physical fitness and safety, community organization, administrative, legislative and judicial aspects of policymaking are reviewed and assessed.

181. Energy Policy. (3) Two 1 ½-hour lectures per week. Introduction to the economic analysis for America's "energy problem" especially policy choices affecting energy demand and conservation, energy supply and exploitation of finite energy resources and environmental damages from energy production and use. Solar subsidies, building and appliance efficiency standards, the strategic petroleum reserve, access to development of western coal and other policies will be examined.

182. Political Skill in the Making of Public Policy. (3) Two 1 ½-hour lectures per week. Strategic considerations in managing problems of policy design and implementation. Study of the basic properties of the adversary system, its opponents, and to issues of "timing." Analysis of these problems in the context of American legislative and bureaucratic structures. Focuses on professional and citizen activist roles.

183. Developing, Implementing & Evaluating Social Policies and Programs. (3) Two 1 ½-hour lectures per week. An examination of the substance of various American current social policies and programs, such as those in the area of day care, family and drug treatment. Special attention is given to how those policies and programs developed and to problems in implementing and evaluating them effectively.

184. The Economics of Public Problem Solving. (3) Two 1 ½-hour lectures and one 1-hour discussion per week. Prerequisites: Economics 100A or 101A or equivalent. Lectures will cover extensions and applications of microeconomic theory as required for use in practical public policy analysis. Case studies of the techniques will be drawn from diverse policy applications: welfare reform, national health insurance, public employment, energy shortage, public regulation and others.

185. An Introduction to the Politics of Policy Advising. (3) Two 1 ½-hour lectures per week. Starting with an overview of policy-making processes in the U.S., this course examines the functions of advice, who provides it to whom, the conditions under which it is accepted or rejected and the political and bureaucratic environment of policy advising. It explores advising by examining domestic and foreign policy issues.

186. Equal Opportunity, Affirmative Action, and Public Policy. (3) Two 1 ½-hour lectures per week. Examines the conflicts of values and interests in equal opportunity policy, with emphasis on affirmative action, minority admissions in higher education and the policy controversies. (3) Controversial Policies. The role of the courts and of the political process in determining such policies will also be considered. (F)

187. Legal Institutions and Public Policy. (3) Two 1 ½-hour lectures per week. Issues of public policy are increasingly resolved by the judiciary. How does judicial policy making differ from where it is carried out elsewhere in government? How has the involvement of the courts in issues of public policy changed the character of the judiciary? Among current issues interesting legal policy to be discussed: abortion, preferential admissions and exclusionary zoning.

188. Policy Issues in Urban and Industrial American. (3) Two 1 ½ hour lectures 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 and moral implications, (2) Consumer Protection: How should we discuss the economics literature on whether market forces can be trusted to ensure efficient quality and safety, American regulation of product safety, and relevant policy law (3) Stirling and Curious Wastes: recent proposals to solve this problem, as well as the extent of the problem. (F, Spring)

190. Directed Group Study. (1-4) Course may be repeated for credit. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor. Group study of a selected topic or topics in Public Policy. Meetings to be arranged.

191. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a pass/no pass basis. Prerequisites: Upper division standing. For upper division students who wish to pursue special study and directed research under direction of a member of the staff. Enrollment is restricted. (See pages 91-92 of the General Catalog for requirements for enrollment.) (F, SP)

Core Curriculum

Note: Core curriculum courses are open only to students in the School of Public Policy.

200. Introduction to Policy Analysis. (4) Two 2-hour discussions per week. Prerequisites: Open only to students in the Graduate School of Policy. Formerly 200A-200B. This introductory course will integrate various social science disciplines and apply these perspectives to problems of public policy. Throughout the academic term, students will apply knowledge of politics, economics, sociology, and quantitative methods in the analysis of case studies of policymakers and managers making decisions. Students learn to use the techniques of social science to evaluate projects and programs. Course will include the preparation of a major paper for a client. (SP)

205. Advanced Policy Analysis. (6) Three hours of seminar per week. Prerequisites: Open only to majors who have completed the core curriculum. Each student will conduct thorough analysis on a major policy question. In this research, students will apply the interdisciplinary methods approaches and perspectives studied in the core curriculum. (SP)

210A. The Economics of Public Policy Analysis. (4) Two 1 ½-hour lectures/discussions plus a 1-hour session per week. Prerequisites: Open only to students in the Graduate School of Policy. Theories of microeconomic behavior of consumers, producers, and bureaucrats are developed and applied to specific policy issues. Special attention is given to how those policies and programs developed and to problems in implementing and evaluating them effectively. Policy areas are selected to show a broad range of actual applications of theory and a variety of policy strategies. (F)

210B. The Economics of Public Policy Analysis. (4) Two 1 ½-hour lectures/discussions plus a 1-hour review 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 issues. Ability to analyze the effects of alternative public policy 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)

220. Law and Public Policy. (4) Two 2-hour lecture/discussions per week. Prerequisites: Open only to students in the Graduate School of Public Policy. Focuses on the legal aspects of public policy and the relationship among law-making agencies and between law and policy are explored through case-centered studies. (F)

230A-230B. Political and Organizational Aspects of Public Policy Analysis. (4-4) Two 2-hour lec-
tured discussions per week. Prerequisites: Open only to students in the Graduate School of Public Policy. This course presents frameworks and concepts for analyzing and evaluating public policies that are designed to achieve specific objectives. Students will analyze the role of politics and organizational sources of moral issues and on moral dilemmas arising in the design or administration of public programs. A case study of colonialism and independence and the substantial problems that are similar across programs, despite the many dissimilarities of program purposes, size, or context. Licensirig creates a set of tasks and political dynamics that arise in the planning and implementing of policy decisions. Specific topics to be covered will include the role of law in translating, implementing, and enforcing policy decisions. Topics specific to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

*272. Program Tasks and Political Environments In State Licensing Agencies. (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. Governmental policies and enforcement's license for wide range of activities. Licensing creates a set of tasks and political dynamics that arise in the design or administration of policy decisions. Specific topics to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

*273. Moral Issues In Public Policy. (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. Examines the role of law in translating, implementing, and enforcing policy decisions. Specific topics to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

*274. Strategic Management in the Public Sector. (3) One 3-hour seminar per week. Using case materials and role playing, students learn to analyze and evaluate complex public management problems. Some cases are drawn from a variety of policy areas. Middle and top management roles are emphasized. (Also listed as IDS 214.)

265. Policies for Youth. (3) One 3-hour 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 problems associated with this transition, and the strategies that might or might not be made by public and private agencies to deal with these problems in the U.S. and abroad. (SP) Maudlin

*266. Health Policy in the Public and Private Sectors. (3) One 3-hour seminar per week. Prerequisites: A course in microeconomic analysis, health economics, cost-benefit analysis, and an introduction to the policy process. This course will examine the policy process and the role of health care providers and public health officials in the development of health care policy. Specific topics to be covered will include the role of law in translating, implementing, and enforcing policy decisions. Specific topics to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

*267. Constitutional Law and Limits of Power. (3) One 3-hour seminar or two 11/2-hour seminar sessions. How can government resolve social problems and preserve individual rights? What is the balance of power between the three branches of government (executive, legislative, judicial) and between federal and state government, the limit of governmental power, and the effect of bureaucracy, special interests and media? A study of constitutional law and selected problems. Illustrations drawn from government or nonprofit organizations.

*268. Environmental Policy and Regulation. (3) One 3-hour lecture per week. Examination of diverse regulatory policies for enhancing environmental quality, from the viewpoint of both environmental economics and government policy. Specific topics to be covered will include the role of law in translating, implementing, and enforcing policy decisions. Specific topics to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

*269. Scientific Evidence and Public Policy. (3) One 3-hour seminar per week. Examines the role of scientific evidence in formulating and carrying out public health policies. Discussion of how uncertainties, and differing interpretations of "evidence" affects perceptions of policy participants. Case studies include regulation of cancer-causing chemicals, toxic waste, and recombinant DNA.

*270. Law and Social Change. (3) One 3-hour seminar per week. Prerequisites: Limited to graduates or only those undergraduates who have taken Public Policy 107 and have consent of instructor. Examines the interrelationship of law (court decisions, legislative, administrative regulation) and policymaking. Case studies drawn from such diverse fields as public education, welfare, and environmental reform, will illustrate the role of law in translating, implementing, and thwarting policy decisions. Specific topics to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

*271. Program Tasks and Political Environments In State Licensing Agencies. (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. Governmental policies and enforcement's license for a wide range of activities. Licensing creates a set of tasks and political dynamics that arise in the design or administration of policy decisions. Specific topics to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

261. International Comparative Study of Science and Technology Policy. (3) One 3-hour seminar per week. This course will analyze industrial and science policy from international perspectives. It will provide theoretical foundations for understanding public policy role in science and technology, and assess case studies such as biotechnology and superconductivity to help students analyze current political debates regarding technological competitiveness.

262. Policy in Higher Education. (3) One 3-hour seminar per week. This seminar will explore current problems and recent developments on higher education, with special attention to the forces that shape public policy in this area. Topics will include the history and structure of higher education, its political context, finance, function, and evaluation.

264. Strategic Management in the Public Sector. (3) One 3-hour seminar per week. Using case materials and role playing, students learn to analyze and evaluate complex public management problems. Some cases are drawn from a variety of policy areas. Middle and top management roles are emphasized. (Also listed as IDS 214.)

265. Policies for Youth. (3) One 3-hour 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 problems associated with this transition, and the strategies that might or might not be made by public and private agencies to deal with these problems in the U.S. and abroad. (SP) Maudlin

*266. Health Policy in the Public and Private Sectors. (3) One 3-hour seminar per week. Prerequisites: A course in microeconomic analysis, health economics, cost-benefit analysis, and an introduction to the policy process. This course will examine the policy process and the role of health care providers and public health officials in the development of health care policy. Specific topics to be covered will include the role of law in translating, implementing, and enforcing policy decisions. Specific topics to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

*267. Constitutional Law and Limits of Power. (3) One 3-hour seminar or two 11/2-hour seminar sessions. How can government resolve social problems and preserve individual rights? What is the balance of power between the three branches of government (executive, legislative, judicial) and between federal and state government, the limit of governmental power, and the effect of bureaucracy, special interests and media? A study of constitutional law and selected problems. Illustrations drawn from government or nonprofit organizations.

*268. Environmental Policy and Regulation. (3) One 3-hour lecture per week. Examination of diverse regulatory policies for enhancing environmental quality, from the viewpoint of both environmental economics and government policy. Specific topics to be covered will include the role of law in translating, implementing, and enforcing policy decisions. Specific topics to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

*269. Scientific Evidence and Public Policy. (3) One 3-hour seminar per week. Examines the role of scientific evidence in formulating and carrying out public health policies. Discussion of how uncertainties, and differing interpretations of "evidence" affects perceptions of policy participants. Case studies include regulation of cancer-causing chemicals, toxic waste, and recombinant DNA.

*270. Law and Social Change. (3) One 3-hour seminar per week. Prerequisites: Limited to graduates or only those undergraduates who have taken Public Policy 107 and have consent of instructor. Examines the interrelationship of law (court decisions, legislative, administrative regulation) and policymaking. Case studies drawn from such diverse fields as public education, welfare, and environmental reform, will illustrate the role of law in translating, implementing, and thwarting policy decisions. Specific topics to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

*271. Program Tasks and Political Environments In State Licensing Agencies. (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. Governmental policies and enforcement's license for a wide range of activities. Licensing creates a set of tasks and political dynamics that arise in the design or administration of policy decisions. Specific topics to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

*272. Program Tasks and Political Environments In State Licensing Agencies. (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. Governmental policies and enforcement's license for a wide range of activities. Licensing creates a set of tasks and political dynamics that arise in the design or administration of policy decisions. Specific topics to be covered will include change from year to year: e.g., discretion, compliance, and the law and procedural justice.

*273. Moral Issues In Public Policy. (3) One 3-hour seminar per week. Focuses on the social and organizational sources of moral issues and on moral dilemmas arising in the design or administration of public policies rather than on logical and philosophical anal
yses of ethical positions. Problems and illustrations will be drawn from a variety of policy areas and professions.

**274. Gender Policy.** (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. Explores a range of political, legal, and normative issues surrounding gender public policy problems in the treatment of men and women. Issues to be considered include employment, social welfare, family policy, political participation, education, contraception, and abortion. Will draw on the experiences of other industrialized nations. (F,SP) Alternative analytic frameworks will be emphasized.

**275. The Problem of Social Cooperation.** (3) One 3-hour seminar per week. Exploration of the idea of "enlightened self-interest" from an ethical, instrumental, policy, biological, and cultural point of view. Special attention will be given to the concept of self-interest as a basis for social cooperation.

**276. Economic Analysis and Public Policy.** (1-3) One 3-hour lecture per week. Prerequisites: Economics 255A or consent of instructor. Students in this course undertake analyses of the fiscal and economic choices available to the City of San Francisco and other local and state governments and its operating agencies. Analyses typically include attention to project definition, delineation of realistic options, and attention to economic, fiscal and political consequences of policy decisions. Projects are often undertaken in collaborative groups. (F,SP)

**277. Knowing and Valuing in Public Policy.** (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. This seminar confronts a series of fundamental policy issues. How does one position oneself in relation to the intuitive and analytic analyses? 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 seminar readings to concrete policy issues. (F,SP)

**279. Organizational Decline and Cutback Management.** (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. Examines how organizations behave when faced with resource cutbacks. An analysis of differences in the response of public and private organizations to fiscal stress, with attention to the threat posed by organizational decline to traditional pluralistic politics. Case studies will be drawn from a variety of sources: the experiences of New York City's municipal agencies during the fiscal crisis of 1974-78 and the behavior of local governments in California following passage of Proposition 13.

**284. Financial Innovation and Public Policy.** (3) One 3-hour seminar per week. An examination of the impact of public policies on the nation's rapidly changing financial markets. Selected cases of private markets under public regulation will be studied, including regulatory issues in the venture capital market, the development of alternative mortgage instruments, the investment of pension funds, and other areas of public intervention in the allocation of capital.

**288. Seminar in Energy Policy.** (3) One 3-hour seminar per week. The nature of the energy problem. Formulation and implementation of energy policy. The theory of economic models and quantitative analysis of energy policy. U.S. energy policy options. A history of energy policy in the U.S. and the Western world during the last four decades.

**289. The Uses and Abuses of Social Science in Social Policymaking.** (3) One 3-hour seminar per week. Examines applications of social science research in social policymaking by government through case materials in the field of human resources as policy. Linkages between research and policymaking will be considered. Arch findings will be emphasized.

**292. Directed Advanced Study.** (1-12) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Must be a Ph.D. student in Public Policy in third year or beyond. Discussion and analysis of dissertation research projects, including conceptual and methodological problems of designing and conducting policy research. (F)

**296. Ph.D. Seminar.** (2) Course may be repeated for credit. One 2-hour seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Must be a Ph.D. student in Public Policy in third year or beyond. Discussion and analysis of dissertation research projects, including conceptual and methodological problems of designing and conducting policy research. (F,SP)

**299. Independent Study in Preparation for the Master's Essay.** (3) Credit to be awarded upon 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 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)

Related Courses in the Program in Public and Nonprofit Management

IDS 206. Advanced Seminar in Public and Nonprofit Management. (3)
IDS 207. Managers and Management. (3)
IDS 206. Techniques of Management Control. (3)
IDS 209. Applied Microeconomics. (3)
IDS 210. Organizational Understanding for Managers. (3)
IDS 211. Public Sector Accounting. (3)
IDS 212. Financial Management. (3)
IDS 214. Strategic Management in the Public Sector. (3)
IDS 217. Technology, Tasks and Politics. (3)
IDS 218. Information Resource Management. (3)
IDS 219. Financing Tools for Public Managers. (3)
IDS 220. Management Professionals in Organizations. (3)

For information about these and other courses related to this program, see the section on Public and Nonprofit Management.

**Range Management**

(College of Natural Resources, Interdepartmental Graduate Groups)

Office: 145 Mullford Hall, 642-3765

Professors: Herbert G. Baker, Ph.D. (Botany) Management, Ph.D. (Forestry and Resource Management)
Don C. Erman, Ph.D. (Forestry and Resource Management) Sally K. Fairey, Ph.D. (Forestry and Resource Management, Landscape Architecture)
Lousie P. Fortmann, Ph.D. (Forestry and Resource Management)
Robert E. Martin, Ph.D. (Forestry and Resource Management)
John A. Zivnuska, Ph.D. (Emeritus) (Forestry and Resource Management)

Graduate Adviser: Mr. Bartolome.

This program is administered by an interdepartmental group consisting of faculty members from the Department of Forestry and Resource Management and related departments on the Berkeley campus. The program is designed to enable students with a B.S. degree in range management, forestry, or in related disciplines to obtain advanced work in this field. Graduate study leads to the Master of Science degree and serves students with advanced professional interests as well as those wishing to specialize in a basic aspect of range, management, such as grass or shrubland ecology, forage in relation to livestock or wildlife management, or rangeland vegetation manipulation.

Excellent laboratory and field facilities include several experimental range properties and large acreages of wildland ranges that are easily accessible from Berkeley. The staff is actively involved in both theoretical and practical research.

**Religious Studies**

(University of California, Berkeley)

Group Major Office: Division of Undergraduate and Interdisciplinary Studies, 301 Campbell Hall, 642-6894

Advisory Committee: Robert Bellah (Sociology), William Bouwesma (History), William Brinner (Near Eastern Studies), Hubert Dreyfus (Philosophy), Susanna Elm (History), Linda Hess (South/Southeast Asia Studies), Lewis Lancaster (Oriental Languages), William Simmons (Anthropology).

**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 focusing on a thematic concern or a particular religious tradition. It views religion from a global perspective and combines aspects of the humanities and the social sciences. The major is open to anyone interested in the symbolic and mythic dimensions of worldviews, the ethical aspects of human societies, and existential issues. It is not restricted to those who have a religious background or are pursuing a religious vocation. Members of the major will be challenged to view religion multiculturally and from critical as well as appreciative perspectives.

Graduates in the program have gone on careers in law, journalism, medicine, international business, counseling, and religious vocations. Others have entered graduate school in the fields of 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 place primary emphasis on these major fields of emphasis, or as supplementary courses include the Jewish, Islamic, Christian, Hindu, and Buddhist traditions, as well as the religious cultures of China, Japan, Africa, and Native American communities.

Most of the courses available for the program are related to the fields of emphasis as major fields of emphasis or as supplementary courses such as myth, ritual, transformative experience, that may be included as major fields of emphasis. The registration procedure may be found in the administrative matters. The group major in religious studies is administered by religious studies, including thematic topics of religious topics. As a supplement to these courses, the program related courses taught within such departments can be found in the group major.

The group major in religious studies is administered by the Division of Undergraduate Studies. Students are referred to that office for all administrative matters.

Lower Division Requirement: Religious Studies

**90A-90B, Introduction to the Study of Religion**

To be taken before selecting a field of emphasis.

**Upper Division Requirement:**

Two methodological courses from the following: Anthropology 158 (Religion and Anthropology), Philosophy 126 (Philosophy of Religion), Sociology 112 (Sociology of Religion), Religious Studies 115 (Topics in the Study of Religion) when topic is methodological.

Two thematic courses from the following: Classics 178 (Mythology) or Comparative Literature 165 (Myth and Literature), Religious Studies 115 (Mythology) or Comparative Literature 125 (The Mystical Tradition in Literature), Religious Studies 190 (Topics in the Study of Religion) when topic is thematic.

Three courses in one of the fields of emphasis (see below).

Additional religion courses to make a total of at least 30 upper division units. The selection of these courses must be approved in writing by a major adviser (see the religious studies student affairs officer at the beginning of each semester for a current list of courses on topics in religion).

**Fields of Emphasis:**

The field may be any cross-cultural theme (such as the study of ritual, myth, or ethics) in which three courses are available, a cultural period (such as the religious interaction of medieval Europe or modern Asia), or the study of a single religious tradition (such as Christianity or Buddhism). Courses available in religious traditions include the following:

**Buddhism:**


**Hinduism:**


**Judaism:**


**Islam:**


**Christianity:**


**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 religious studies degree must 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 with a letter grade of C- or higher. A minimum of 15 upper division courses 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 liberal arts work and the major courses at the beginning of their senior year. Required are upper division work in a language relevant to the student's academic program (with consent of advisor) and the submission of a bachelor's thesis as a culmination of one or two semesters of the sequence, Religious Studies H195A-H195B. The thesis must be approved by both the advisor and the student's thesis director, if these are different.

**Lower Division Courses:**

90A-90B. Introduction to Religious Studies. (4-4)

Three hours lecture per week. Two semester sequence designed as a survey of major religious traditions in the major themes in the comparative study of religions. Methodology and theoretical issues in the history and study of religion will be interwoven with the exploration of intercultural religious phenomena such as ritual, myth, the concept of the sacred, religious communities, and ethical guides.

**(F,SP) Smith, Ulansky**

**Upper Division Courses:**

115. Mysticism. (3) Three hours lecture per week. Studies in the literature and piety of various mystical traditions, including readings of scripture, mystical poetry, spiritual discourse, autobiography, etc. The relationship of several forms of mysticism to their religious traditions will be treated. (SP) Smith

120A. Origins of Christianity. (4) Three hours lecture per week plus one hour of discussion with extra preparation. The Early Jesus Movement in its Social and Historical Setting. Particular attention to the transformations of various Jewish religious concepts; traditions and parallels in Hindu, Buddhist, and Zoroastrian religious eschatology; Paul and his interpreters. (F) Elms

120B. Origins of Christianity. (4) Two hours of lecture and two hours of seminar per week. Ventures in Early Christianity. Conflicts of interpretation of both Old Testament and Christian message; Marcion; the Gnostics: mystical prophesy; radical prophecy; the idea of heresy. (F) Elms

190. Topics in the Study of Religion. (3) May be repeated for credit. Three hours lecture per week. Selected topics or problems in the study of religion. (F,SP) Smith

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 successful theses. Successful completion of the course will normally, but not necessarily, mean the awarding of honors. (F,SP) Staff

**198. Directed Group Study.**

(1-4) 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. (F,SP) Staff

**199. Supervised Independent Study.**

(1-4) May be repeated for credit. Independent study. Must be taken on a passed/not passed basis. (F,SP) Staff

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**Rhetoric (College of Letters and Science)**

**Department Office:** 2125 Deane Hall, 642-1415

**Professors:**

Seymour B. Chatman, Ph.D. University of Michigan.

Narrative structure, film, semiotics

David Cohen, Ph.D. Cambridge University. J.D. University of California. Classical Greek law/theater

Evelyn Fox Keller, Ph.D. Harvard University. Science, feminism, women's studies

Evelyn M. O'Connell, Ph.D. Northwestern University. Poetry, translation

Arthur J. Quinn, Ph.D. Princeton University. Nonfictional narrative

Barbara Shapiro, Ph.D. Harvard University. Early modern rhetoric

Thomas O. Skone, Ph.D. Northwestern University. Renaissance literature, humanist rhetoric

Robert L. Breon (Emeritus), Pennsylvania State University. Prosody, modern poetry

William J. Brandt, Ph.D. University of California at Berkeley. Bret B. Wilson (Emeritus), Ph.D. Cornell University

**Associate Professors:**

Anthony J. Cascardi, Ph.D. Harvard University. Philosophy, literature

Bridget Connelly, Ph.D. University of California. Oral literature

Daniel F. Mella, Ph.D. Harvard University. Oral literature, Celtic, folklore

Todd McGraw, Ph.D. University of Iowa. The novel, Conrad, imperialism

**Assistant Professors:**

Marianne Constable, J.D., Ph.D. University of California. Law, philosophy, social theory

Frederick M. Dolan, Ph.D. Princeton University. Political theory, philosophy, theories of interpretation

Felipe Gutierrez (Acting), J.D. University of California at Berkeley. Contemporary rhetorical theory, social theory, legal rhetoric

Michael Masuch, Ph.D. Oxford University. Literature and society

**Lecturers:**

Philip Frankel, B.A. Williams College

Adrienne Miller, M.A. University of California at Berkeley, J.D. Hastings School of Law

Ward E. Tabler, A.B., L.H.D. (hon.) (Emeritus)

**Major Advisers:** Check with department office.

Graduate Adviser: Mr. Mella.

Rhetoric is the study of the communicative relationship between author and audience. This approach to written and spoken communication, of whatever type, necessitates the consideration of the author's intention to persuade, entertain, inform, or form the audience through some form of discourse. Modern rhetoric adapts classical theories of persuasion to all forms of discourse, and is also concerned with the expansion and development of rhetorical theory itself.

The aim of the department's undergraduate program is to educate students who are sophisticated readers in a wide range of discourse, who can present and defend their interpretations persuasively, whether orally or in writing, and who are prepared to develop effective arguments in the areas studied, once they acquire relevant knowledge. Students in the major program profit from the mastery of basic skills to the study of theory and history and complete their work with refinement of both in courses applying theory to the analysis of texts. Graduate courses deal with rhetorical theory, its history, and its application to special topics.

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*On leave, spring

Recalled to active service

Recipient of Distinguished Teaching Award
Major Program

Students who entered the program before fall 1991 and have not taken Rhetoric 10 offered beginning fall 1991 should check with the department regarding requirements for the major and minor. Note: Rhetoric 170 offered fall 1971 and thereafter is NOT equivalent to Rhetoric 1B.

Undergraduate courses in rhetoric are grouped into three categories: theory and history of rhetorical practice; ficive discourse; and argumentative and declarative discourse. For the major, students must fulfill the following requirements: Rhetoric 10; 30 or 32, and 100 and 101, plus five additional upper division courses, which must include at least one course from each of the three categories:

I. Theory and History of Rhetorical Practice. Theory courses explore the major efforts to establish a philosophical basis for rhetorical practice. History courses familiarize the student with rhetoric as a continuous part of Western intellectual tradition from the Classical period to our own time. Rhetoric 105A-105B-105C-105D-105E, 121A, 126, 164, 165, 166, 168, 171, 177.

II. Fictive Discourse. These courses examine the ways in which modes such as lyric poetry, the novel, and film achieve their special impact on audience. Rhetoric 102, 121B, 122, 124, 125, 128, 135, 142, 144, 156.

III. Argumentative and Declarative Discourse. These courses provide methods for analyzing the persuasive strategies employed in various kinds of argument including legal, political, philosophical, historical, religious, etc. Rhetoric 110, 130, 131, 150, 152, 153, 154, 155, 157, 158, 160, 161, 167, 170, 172, 173, 175.

Rhetoric 10 and either 30 or 32 are prerequisite to all upper division courses unless otherwise specified. A grade of C or better in courses 30 or 32 and specified upper division course(s) is required to receive credit toward completion of the major program. Rhetoric 10 is a prerequisite to 30 and 32.

Passed or Not Passed. No course taken passed or not passed may be used to satisfy a requirement for the major or minor.

Honors Program. A thesis is required of majors seeking the bachelor's degree with honors. Four units of credit (2 units each semester) for Rhetoric 1190 may be applied toward graduation as upper division units and fulfillment of one major upper division elective. To receive honors in the major, candidates must complete the 4-unit honors thesis course with a grade of A or better, have a grade-point average of at least 3.5 in all rhetoric courses, and have an overall grade-point average of at least 3.5.

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 receive a minor in rhetoric, students must complete the following:

Required Courses: Rhetoric 10, Rhetoric 100.

Elective Courses: Four upper division rhetoric courses numbered between 101 and 179.

Graduate Program

The Department of Rhetoric offers programs leading to both the M.A. and Ph.D. degrees. Students are admitted to the graduate program in the fall semester only. The first two fall semesters are spent preparing for the M.A. examination, a general three-hour examination covering the major areas of study within the department. Predoctoral students with an M.A. from another department or institution must also pass the M.A. examination with a recommendation for completion of graduate work by the end of their second year of study. For the M.A. degree in Rhetoric, six semester courses are required of which at least five must be graduate courses in Rhetoric. They must include one of the following: Rhetoric 200 (The Rhetorical Tradition) and 205 (Contemporary Rhetorical Criticism). Opportunities are available for M.A. and Ph.D. candidates to serve as graduate student instructors in the department. In the second semester in the program in which students are employed as graduate student instructors, they are required to enroll in Rhetoric 300, Problems in Teaching Rhetoric. Individual programs and plans are carefully planned in conference with the graduate adviser.

Lower 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.

1A. The Craft of Writing. (4) Three 1-hour lecture and discussion meetings per week plus individual conferences. Prerequisites: Subject A or examination. Rhetorical approach to teaching argumentation and writing argumentative discourse. Close reading of selected texts; written themes developed from class discussion and analysis of rhetorical strategies. (F,SP)

2A1. Introduction to Language and the Craft of Writing. (5) Three 1-hour meeting/lecture/discussion. Prerequisites: Any TA-IB sequence or upper division writing skills. Ethical, logical and pathetic appeals; control of register and tone; assessment of a wide variety of real audiences; genre studies. (F,SP) Willy

2A2. Fundamentals of Public Speaking. (2) Two 1 1/2-hour meetings per week. Must be taken on a passed/not passed basis. Practice in the oral presentation of ideas.

10. Introduction to Practical Reasoning & Critical Analysis of Argument. (4) Three 1-hour lecture and discussion meetings per week. An introduction to practical reasoning and the critical analysis of argument. Topics treated will include: definition, the syllogism, the enthymeme, 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)

30. Rhetorical Theory and Oral Argument. (4) Two 1 1/2-hour lecture/discussion and one 1-hour performance per week. Prerequisites: 1A-1B or 10. Examination of basic principles of rhetoric and strategies of argumentation, with practice in oral argument. (F,SP) Sibane, Miller

32. Fundamentals of English Literature. (4) Three 1-hour meetings per week. Use of oral performance as a critical instrument in the rhetorical analysis of literature, primarily lyric poetry, and construction in poetic figurative language.

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.

100. The Rhetorical Tradition. (4) Three 1-hour lectures and one 1-hour discussion per week. Examination of the major texts of rhetorical theory in Classical antiquity, with consideration of various modern extensions of the theory. (F,SP) Staff

101. Modern Rhetorical Theory. (4) Three 1-hour lectures per week. Prerequisites: 10 and 30 or 32. Close reading of the works of modern writers on language whose point of view can be described as rhetorical: Richards, Burke, Cassirer, and others. (F,SP) Constable

105. Rhetorical Theory and Practice in Historical Eras. (4) Three 1-hour lectures per week. Examination of how rhetorical principles and patterns are used to point up a speaker's or writer's presentation of self in relation to the character of an intended audience. (F,SP) Staff

105A. Middle Ages. (4) (F,SP) Staff

105B. Renaissance. (4) (F,SP) Shapiro

105C. Seventeenth Century. (4) Staff

105D. Enlightenment. (4) (F,SP) Dolan

105E. Nineteenth Century. (4) (F,SP) Quinn

110. Advanced Argumentative Writing. (4) Three 1-hour meetings per week plus individual conferences. Prerequisites: Any 1A-1B sequence or upper division writing. The purpose of this course is to learn how to write clear, concise, interesting nonfiction that can be sold in the commercial market; and in the process, learn how to write in the above manner for whatever purpose and be aware how journalists write for us. Readings of contemporary history and journalism are mixed with writing exercises aimed at producing well-crafted newspaper stories, magazine articles and non-fiction books. (F,SP) Fradkin

110A. Advanced Nonfiction Writing. (4) Three 1-hour meetings per week plus individual conferences. Prerequisites: Any 1A-1B sequence or upper division writing. The purpose of this course is to learn how to write clear, concise, interesting nonfiction that can be sold in the commercial market; and in the process, learn how to write in the above manner for whatever purpose and be aware how journalists write for us. Readings of contemporary history and journalism are mixed with writing exercises aimed at producing well-crafted newspaper stories, magazine articles and non-fiction books. (F,SP) Fradkin

110M. Advanced Argumentative Writing. (4) Students may not take both 110 and 110M. Three 1-hour meetings per week plus individual conferences. Prerequisites: Any 1A-1B sequence or upper division writing. The purpose of this course is to learn how to write clear, concise, interesting nonfiction that can be sold in the commercial market; and in the process, learn how to write in the above manner for whatever purpose and be aware how journalists write for us. Readings of contemporary history and journalism are mixed with writing exercises aimed at producing well-crafted newspaper stories, magazine articles and non-fiction books. (F,SP) Fradkin

121A-121B. Rhetoric of Fiction. (4,4) Three 1-hour lectures per week. Prerequisites: A is prerequisite to B. A. Form: Definition and techniques of narrative, including voice, point of view, time order, 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. (F) (SP) Staff

122. Rhetoric of Drama. (4) Three 1-hour lectures per week. Prerequisites: 30. Examination of the way character is created in drama by repetitive rhetorical patterns and the ways themes are defined by manipulation of such patterns. (F,SP) Staff

124. Rhetoric of Poetry. (4) Three 1-hour lectures per week. Prerequisites: 30. Consideration of the relationship between the texture of poetic discourse largely defined by figures of speech and overall poetic structures. (F,SP) Staff

125. Poetics and Poetry. (3) Three 1-hour discussions per week; occasional lectures. Prerequisites: Upper division standing. Studies in the relationships between poetic theory and poetic practice from Aristotle's Poetics to the present day. (F,SP) Staff
120. Rhetoric of the Realist Novel. (3) Three 1-hour lectures 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. (F, SP) Mascuch

127. Novel and Society. (4) Course may be repeated for credit with consent of instructor. Three 1-hour lectures per week. Prerequisites: 121A and 121B. Intensive analysis of novelistic discourse with specific reference to social context. Focus on authorial intention as a form of social practice. (F) Mascuch

128. Novel Into Film. (3) Three 1-hour lectures per week plus viewing sessions. Close examination of 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. (SP) Chatman

129. Theories of Film. (3) Three 1-hour lectures per week plus viewing sessions. Prerequisites: One UC film course. Classical theories of film by Eisenstein, Anheim, Kracauer, Bazin, Metz, and others. Only one or two films will be analyzed in great depth to test the power of various theories. (F, SP) Chatman

130. Political Oratory. (3) Three 1-hour lectures per week. Theory and practice of deliberative oratory, with emphasis on the study of actual speeches from Thucydides, the Attic orators, Cicero, Sallust, Tacitus, and 18th and 19th centuries British and American parliaments. Examination of the rhetoric of the law. (F, SP) constabie

131. Rhetoric of Religious Discourse. (3) Three 1-hour lectures 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. (SP) Quinn

132. Rhetoric, Culture and Society. (3) Three 1-hour lectures per week. Prerequisites: 100: Upper division standing. Analysis of rhetorical practice in the context of social and cultural change with particular reference to the historical transition from pre-industrial to industrial society in the west. (F, SP) Mascuch

133. Rhetoric of Narrative Genres in Non-Literate Societies. (4) May be repeated for credit with a different instructor. Three 1-hour lectures per week. Investigation of the rhetorical and cultural principles common to various genres of narrative, both prose and poetic, across different cultures. Mythic, epic, and folk narratives considered as well as written works from cultures in transition. (SP) Quinn

136. Rhetorical Approaches of Folklore. (4) Course may be repeated with consent of the instructor. Two 1½-hour lectures per week. Performance, persuasion and the role of rhetoric in the telling of stories. The course will explore performance genres on the margins of orality-literacy in diverse cultures, including particularly contemporary Arabic folk cultures, medieval European vernacular traditions, and contemporary American popular cultures. (F, SP) Connolly

137. Comparative Rhetoric. (4) Course may be repeated for credit with permission of the instructor. Two 1½-hour lectures per week. Performance, persuasion and the role of rhetoric in the telling of stories. The course will explore performance genres on the margins of orality-literacy in diverse cultures, including particularly contemporary Arabic folk cultures, medieval European vernacular traditions, and contemporary American popular cultures. (F, SP) Connolly

138. Rhetoric of Autobiography. (4) Three 1-hour lectures per week. Prerequisites: Upper division standing. Rhetorical analysis of autobiographical discourse, with an attention to the evolution of the genre in relation to changing modes of human subjectivity. (F, SP) Mascuch

142. The Lyric Mode. (3) Three 1-hour meetings per week. Prerequisites: 32 and either 102 or 144. Qualities of various lyric modes developed through oral reading; advanced study of the traditional lyric voices in major American and English literary periods. (SP) Cohen

143. Rhetoric of Contemporary Politics. (3) Three 1-hour lectures per week. Examination of the characteristic rhetoric of a variety of manifestations of modern politics. Emphasis on building a theoretical foundation for critically observing and participating in the contemporary political process. (F, SP)


155. Rhetoric of Imperialism. (3) Three 1-hour lectures per week. Analysis of rhetorical patterns in official and public documents relating to English, French, and German imperial expansion policies in the 19th century; special attention to Middle Eastern and African spheres of interest. (F) Willy

156. Rhetoric of the Political Novel. (4) Three 1-hour lectures per week. Analysis of novels by Any 1A-1B, 1C and 1D and of the major 19th and 20th century works of fiction in which political stances are exploited as dominant themes; close reading of authorial viewpoints and rhetorical strategies. (F, SP) Willy

157. Rhetorical Political Theory. (4) Three 1-hour lectures per week. Examination of the rhetorical strategies of selected political theorists and their influence on rhetoric in the 17th century onward. Specific themes and readings vary from year to year. (F) Dolan

158. Advanced Problems in the Rhetoric of Political Theory. (4) Three 1-hour lectures per week. Examination of the sources of evil emerges as a significant motif in the novelistic discourse and the social history of the modern individual. Readings will be drawn from primary and secondary sources in the Western tradition, in translation where appropriate. (SP) Cascarci

159. Rhetoric of Legislative Discourse. (3) Three 1-hour lectures per week. Examination of the figurative language and rhetoric used by members of Congress to explain the sources of evil. (F) Cohen

160. Introduction to the Rhetoric of Legal Discourse. (3) Three 1-hour lectures per week. The application of rhetorical methodology to all categories of legal texts. (SP) Constable

161. Rhetoric of Legal Argumentation. (3) Three 1-hour lectures per week. Analysis of the special function of rules and values in legal argumentation; emphasis on the interplay of interpretation and policy in the definition of social values through legal persuasion. (F) Cohen

162. Rhetoric of Legal Theory. (3) Three 1-hour lectures per week. Examination of the rhetorical strategies applied to close analysis of the argumentative framework of important works in modern legal theory. (F, SP) Constable, Gutteriez

165. Rhetoric of Legal Philosophy. (3) Three 1-hour lectures per week. Consideration of basic philosophical issues relating to law and moral foundations of the law. (F) Constable

166. Rhetoric, Law, and Politics in Ancient Greece. (3) Three 1-hour lectures per week. Examination of the role of rhetoric in Greek legal and political thought. (SP) Cohen

167. Advanced Topics in Law and Rhetoric. (4) Three 1-hour meetings per week. Prerequisites: At least one course from 160, 161, 164 or 165. In-depth consideration of particular topics concerning rhetorical aspects of legal philosophy, legal theory, legal argumentation, etc. (SP) Gutteriez

168. Rhetoric, Law, and Political Theory. 1500-1700. (4) Three 1-hour lectures per week. Examination of European political and legal discourse from 1450 to 1700. (F) Shapiro

169. Rhetoric of Social Science. (3) Three 1-hour lectures per week. Analysis of the ways in which political scientists, sociologists, economists and psychologists establish the authoritative- ness of their claims. Focus on the presentation of data as fact, the use of quantitative methods, and the tendency of social theorists to transform themselves into objective information. (F) Constable

170. The Problem of Mass Culture and the Rhetoric of Social Theory. (3) Three 1-hour lectures per week. Study of the textual strategies whereby the masses and mass culture emerge as objects of anxiety, hope, and scrutiny for social theorists of the 19th and 20th centuries. (SP) Dolan

172. Rhetoric of Social Theory. (3) Three 1-hour lectures per week. Rhetorical analysis of theorists from Durkheim and Weber, as well as Marx, Ricardo and Bentham, to contemporary representatives of social and economic thought. (SP) Quinn

173. Rhetoric of Historical Discourse. (3) Three 1-hour lectures per week. Rhetorical analysis of the historical practices of selected narrative historians such as Gibbon and Carlyle; historical discourse considered as a sausory act. (SP) Quinn

174. Rhetoric of Scientific Discourse. (3) Three 1-hour lectures per week. Examination of the characteristic functions of discourse in and about the natural sciences; particular attention to the ways in which scientific language both guarantees, and at the same time, obscures the expression of social norms in scientific facts. (SP)

175. Rhetoric of Philosophical Discourse. (3) Three 1-hour lectures per week. Introduction to philosophical issues involved in applying rhetorical analysis to philosophical discourse; intensive analysis of selected philosophical works. (SP)

176. The Problem of Evil and the Rhetoric of the Modern Novel. (3) Three 1-hour lectures per week. This course will focus upon the problem of evil as one of central concern in the novelistic discourse of the modern period; particular attention to the novelistic treatment of evil in the late eighteenth and the nineteenth-century novel. (SP) Mascuch

177. Language, Truth and Dialogue. (3) Three 1-hour lectures per week. Examination of philosophical dialogues from Plato to Heidegger. Focus on the interaction within the dialogue, the participation required of the reader/listener, and the relation of such interaction and participation to thinking, speaking and knowing. (SP)

178. The Rhetoric of the Novel. (4) Course may be repeated for credit. Three hours of lecture and discussion per week. Prerequisites: Juniors and Seniors; 30 or consent of instructor. Examination of the rhetoric of radio, TV, newspapers, magazines, and nonfiction books with the emphasis on how arguments are made within the stated professional goal of objectivity. The focus will be on four issues of contemporary concern: the power of the media, the degradation of criticism, the nature of the public sphere, and the relationship of the political and the aesthetic. (SP) Cascarci

179. The Rhetoric of Political Journalism. (4) Two 1½-hour lectures per week. Prerequisites: Juniors and Seniors; 30 or consent of instructor. Examination of the rhetoric of radio, TV, newspapers, magazines, and nonfiction books with the emphasis on how arguments are made within the stated professional goal of objectivity. The focus will be on four issues of contemporary concern: the power of the media, the degradation of criticism, the nature of the public sphere, and the relationship of the political and the aesthetic. (SP) Cascarci

180. On leave, spring

181. On leave, spring

182. On leave, spring
ing environment, the prevalence of racism, and the perpetuity of warfare. (F,SP) Fradkin

H190A-H190B, Honors Thesis. (2,2) Tutorial- Students must take both in the same semester. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Senior standing with a 3.7 GPA in Rhetoric and 3.5 GPA overall. Formerly H190. Independent study under guidance of a faculty director culminating in a written thesis. Required of all Rhetoric majors desiring to earn the A.B. degree with honors. (F,SP)

196. Special Topics. (3) Course may be repeated for credit. Three 1-hour lectures/seminars per week. Prerequisites: Consent of instructor. Group instruction and investigation of topics not accommodated in regular course offerings. (F,SP)

198. Supervised Group Study. (1-3) Course may be repeated for credit. Tutorial. Must be taken on a pass/no pass basis. Prerequisites: Junior standing and approval of adviser. Instruction for a small group of students on a topic initiated by those students. (F,SP)

199. Supervised Independent Study. (1-3) Course may be repeated for credit. Tutorial. Must be taken on a pass/no pass basis. Prerequisites: 3.0 GPA. For special projects that cannot be otherwise accommodated. (F,SP)

Graduate Courses

200. Classical Origins of the Rhetorical Tradition. (4) Three hours of seminar per week. Prerequisites: Graduate status. A detailed examination of the development of the Western rhetorical tradition in ancient Greece and Rome. This course is normally required of all graduate students. (F,SP) Cohen

205. Contemporary Rhetorical Theory and Criticism. (4) Three hours seminar per week. Prerequisites: Graduate status. Intensive examination of the central issues confronting rhetorical criticism in the twentieth century. Normally required of all graduate students. (SP) F. Dolan

215. Research Methodology for Doctoral Study in Rhetoric. (2) Two hours seminar per week. Prerequisites: M.A. degree. An introduction to research methodology, bibliography, and scholarly writing in the field of rhetoric. (SP)

*230. Advanced Studies in History of Rhetoric. (4) May be repeated for credit with different topic. Three hours of seminar per week. Prerequisites: Graduate status. Rhetoric in the specified historical era, both as expounded by theorists and as it permeated various forms of discourse. Special topics to be announced. (F,SP)

230A. Ancient Greece. (4) (F,SP)

230B. Ancient Rome. (4) (F,SP)

230C. The Middle Ages. (4) (F,SP)

230D. The Renaissance. (4) (F,SP) Slone

230E. The Seventeenth Century. (4) (F,SP) Shapiro

230F. The Enlightenment. (4) (F,SP) Dolan

230G. The Nineteenth Century. (4) (F,SP) Quinn

240. Rhetorical Theory and Criticism. (4) May be repeated for credit with different topic. Three hours seminar per week. Prerequisites: Graduate status. Advanced investigation of the rhetorical dimensions of various modes of discourse. Specific topics to be announced. (F,SP)

240A. Poetry. (4) (F,SP)

240B. Novel. (4) (F,SP) Chatman

240C. Oral Literature. (4) (F,SP) Meila

240D. Non-Fictional Prose. (4) (F,SP)

240E. Political Discourse. (4) (F,SP) Shapiro

240F. Legal Rhetoric and Philosophy. (4) (F,SP) Conable

240G. Rhetorical Theory. (4) (F,SP) F. Dolan

240H. Rhetorical Theory and Criticism: Gender and Science. (4) Three-week, consider- able literature has emerged over the last decade arguing for the importance of gender as an analytic category in the history of science. Devoted to an ex- amination of the import of such analyses for our read- ing of more traditional accounts of specific periods in modern scientific history. Will aim at refining the ques- tions that have been posed by feminists, and develop- ing techniques for further analysis of the role that cultural norms of gender have played in the history of science. (F,SP)

270. Proseminars in Rhetoric. (2-4) Course may be repeated for credit. Three hours seminar per week. Prerequisites: Graduate status. Bibliographic explo- nations of rhetorics not covered by ordinary offerings. (F,SP) Connelly

*291A. Oral Performance: Noetics and Poetics. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instruc- tor required. This seminar will explore how oral perfor- mance traditions organize and manage knowledge. Emphasis will be placed upon the totality of the perfor- mance, with a focus upon music as a codeterminant of the meaning and catalyst for composing the text. Also listed as IDS 291A, Music 291A and Southeast Asian 291A. Connelly

*291B. Genres, Embryos, and Shifting Maps of Per- sons and Parenthood. (4) Two and 1/2 hours seminar per week. Prerequisites: Graduation status. Students will investigate a broad range of reproductive issues in which emerging technologies force people to articulate and map new meanings of personhood, parenthood, rights, and responsibilities. Sponsoring De- partments: Rhetoric, Women’s Studies, and Jurispru- dence and Social Policy. Keller

295. Special Study. (1-4) Course may be repeated for credit. Individual tutorial. Prerequisites: Graduate Adviser approval. Open to qualified graduate students wishing to pursue special topics under the direction of a member of the staff. (F,SP)

299. Directed Research. (1-9) Course may be repeated for credit. Individual tutorial. Prerequisites: Graduate Adviser approval. Open to graduate students who have passed their Ph.D. Qualifying Examinations. (F,SP)

601. Individual Study for Master’s Students. (1-5) Course may be repeated for credit. Individual ar- rangement. Must be taken on a satisfactory/unsatis- factory basis. Prerequisites: Graduate status. Individ- ual study for degree or language examinations in consultation with staff member. (F,SP)

602. Individual Study for Doctoral Students. (1-5) Course may be repeated for credit. Individual ar- rangement. Must be taken on a satisfactory/unsatis- factory basis. Prerequisites: Graduate status. Individ- ual study in consultation with faculty director as preparation for degree examinations. (F,SP)

Professional Courses

*300. Problems in Teaching Rhetoric. (2) Course may be repeated for credit. One 2-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as a teaching stu- dent instructor. (F,SP)

300A. Instruction in Teaching Argumentative Writing and Rhetorical Analysis. (2) Course may be repeated for credit. One 2-hour meeting per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as a Teaching Assistant. (F,SP) Shapiro

300B. Instruction in Teaching Public Speaking. (2) Course may be repeated for credit. One 2-hour meet- ing per week. Must be taken on a satisfactory/unsatis- factory basis. Prerequisites: Appointment as a Teaching Assistant. (F,SP) Slone, Miller

300C. Instruction in Teaching Oral Interpretation. (2) Course may be repeated for credit. One 2-hour meet- ing per week. Must be taken on a satisfactory/unsatis- factory basis. Prerequisites: Appointment as a Teaching Assistant. (F,SP)

301A-301B. Pedagogical Practice. (4,4) May be re- peated for credit. Three 1-2 hour discussions per week plus individual conferences. Must be taken on a sat- isfactory/unsatisfactory basis. Prerequisites: Appointment as a graduate student instructor. Supervised classroom teaching. (F,SP)

Romance Philology

(College of Letters and Science)

Program Office: 4125 Dwinelle Hall, 642-2184 or 642-2712


Graduate Adviser: Ms. Fleischman.

The Ph.D. Program. The Group in Romance Philology admisters a program designed to train graduate school teachers and research scholars in the fundamental disciplines of Romance Philology, Romance historical linguistics, and the medieval Romance literatures. Prerequisites are an M.A. or its equivalent in a relevant discipline (e.g., one of the modern Romance languages, linguistics, clas- sics, comparative literature) and a good knowledge of at least one modern Romance language. Once admitted, the student must pass reading exami- nations in French, Italian, Spanish, Latin, and Ger- man. There are no formal course or unit require- ments. The program is tailored to the needs and interests of the individual student; courses may be taken in a variety of departments but especially French, Italian, Spanish and Portuguese, Linguis- tics, Comparative Literature, Classics, and, Medi- eval Studies.

The student's progress in the program will be eval- uated by the faculty of the group at the end of the second term in the program. Permission to proceed will be granted only if the faculty believes that the student shows promise of completing the degree within a reasonable length of time.

In the qualifying examination (three hours, oral) the student is held responsible for seven fields of inter- est, four of which are obligatory (history of French and Spanish literature to 1500, 1500 to 1400; traditional historical and philologi- cal criticism as applied to medieval texts; com- parative Romance linguistics, with emphasis on the historical grammar of French, Italian, and Spanish; highlights in the history of Romance linguistics). The other three might deal with the dialectology of a particular language, the history or literature of one or more minor Romance languages, a field in general linguistics, or other relevant topics.

Normative time for completion of the degree is five years, three for preparation of the qualifying exa- mination, two for the dissertation.

Graduate Courses

*200. Linguistic History of the Roman Empire. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. The spread of Latin over the West- ern Mediterranean area, and its gradual change into the Romance dialects, with emphasis on substrata and suprastrata. Staff

*201. Latin Language and Literature. (3) Three hours of lecture per week. Prerequisites: Consent of in- structor. The internal history of colloquial Latin and Late Latin, down to the Carolingian period, on the ba- sis of original sources. Staff
*202. General Romance Linguistics. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. A historical and synchronic survey of Romance linguistics applied to the major and minor Romance languages. Fleischman

*203. Old Provençal. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. A historical and diachronic study of the Old Provençal (or Occitan) literary language and its component dialects, combining historical grammar and reading of texts. Staff

*204. Problems in Romance Morphology and Syntax. (3) May be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. Problems and methods in diachronic morphology and syntax and their interrelations. Topics vary from year to year. Fleischman

*205. From Romance Dialect Geography to Sociolinguisitics. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Classical and experimental methods of eliciting, recording, and interpreting dialect data, with equal attention to regional and social dialects.

207. Hispano-Romance Dialectology. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Problems and methods in the study of the major linguistic areas of the Iberian Peninsula, in diachronic and synchronic projection. (SP) Craddock

208. Romance Etymology. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. Assumptions and techniques in the study of Romance etymology.

209. Studies in Italo-Romance. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. General survey and specific research projects in the field of Italian Dialectology following diachronic, synchronic, and sociolinguistic approaches. Attention will be given to connections with surrounding Romance areas such as Friulian, Rhaeto-Romance, Sardinian, Stelatini

*211. Highlights in the History of Romance Linguistics. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. The major schools and scholars that dominated the scene over a century and a half (1800-1950) and the vital problems raised by them. Staff

*212. The Romance Epic. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Reading and analysis of relevant texts from the first documents of the Catalan language to the works of the major authors of the XV century. Duggan

*213. Old Catalan. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Reading and analysis of texts from the first documents of the Catalan language to the works of the major authors of the XV century. Duggan

220. Seminar in Romance Philology. (3) Course may be repeated for credit as topic varies. Three-hour seminar per week. (F) Duggan

299. Special Advanced Study. (1-12) May be repeated for credit. Variable. Must be taken on a satisfactory/unsatisfactory basis. Individual research. (F,SP)

602. Individual Study for Doctoral Students. (1-6) May not be used for unit or residence requirements for the doctoral degree. May be repeated for credit. Variable. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for doctoral degrees, 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)

Related Courses in Other Departments


Latin 140, Medieval Latin; Latin 155A-155B, Latin of the fourth and fifth centuries.

Comparative Literature. 152, The Middle Ages; 202A, Approaches to Genre: Epic and Saga; 212, Studies in Medieval Literature.

English. 110A-110B, Medieval Literature; 111, Chaucer; 112, Early English Literature; 207A, Readings in Medieval Latin; 211, Chaucer; 212, Readings in Middle English; 246A-246B, Graduate Prosersminar: Medieval.


German. 273, Gothic.

Italian. 109A-109B, Dante’s 110A-110B, Literature of the 13th and 14th Centuries; 201, Historical Grammar; 208, Minor Medieval Authors; 209, Seminar on Dante; 211, Seminar on Petrarcha; 213, Seminar on Boccaccio.

Linguistics. 110, Introduction to Phonetics and Phonology; 115, Morphology; 120A-120B, Introduction to Syntax and Semantics; 122, Language and Typology and Linguistic Universals; 130, Comparative and Historical Linguistics; 131, Indo-European Comparative Linguistics; 150, Sociolinguistics; 151, Language Variation; 200, Graduate Prosersminar in Linguistics I; 201, Graduate Prosersminar in Linguistics II; 216, Word Formation; 217, Linguistic Implications of Lexicology and Lexicography; 230, Historical Linguistics; 231, Historical Semantics; 235, History of Linguistics; 236, Major Schools of Structural Linguistics.


Spanish and Portuguese. 108, Spanish Ballads; 126, Medieval Spanish Literature; 179, Advanced Course in Hispanic Linguistics; 202, History of Ibero-Romance Literature; 203, Introduction to the Historical Grammar of Ibero-Romance; 209, Seminar in Hispanic Linguistics; 220, Introduction to Medieval Hispanic Literature; 246, Hispanic Paleography.

Portuguese 150, Introduction to Portuguese Linguistics.

Catalan 101, Catalan for Advanced Students; 102, Readings in Catalan.

Scandinavian (College of Letters and Science)

Department Office: 1314 Dwinelle Hall, 642-4484


Associate Professor: Gregory P. Nybo, Ph.D. University of California at Berkeley. (Emotiv) Norwegian literature, narrative, drama.


The Department of Scandinavian offers upper-graduate majors in three Scandinavian languages, Danish, Norwegian, and Swedish, and courses in English in Scandinavian literature and culture, ancient and modern.

The Major

Lower Division. Three courses from the following course sequences: Scandinavian 1A-1B; 11; 3A-3B; 13; 4A-4B; 14; or the equivalents.

Upper Division. Nine upper division courses, including: at least one advanced language course in Scandinavian 101, 103, or 104, or the equivalent; 140 (Swedish, Norwegian, Danish Literature from 16th to mid-19th centuries); 141, 143 is advanced; two Provençal courses in conjunction with 149 (149 itself may not count as one of the nine upper division courses); and two history courses, Scandinavian 123, 127, or 128.

Honors Program. Students must complete with distinction the courses required for the major as well as two semesters of Scandinavian 145. A thesis is also required.

The Minor

Required courses: Five upper division courses.
2) Four electives.

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 interdepartmental programs from students with special interests in areas such as art, film, folklore, history, and linguistics. Interested students should submit detailed written 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 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. Students with less preparation 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 prepare 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, Reformation 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.

The Ph.D. in Scandinavian. General requirements: an M.A. in Scandinavian, or the equivalent. Students must complete two semesters of work in Old Norse, pass the departmental requirements in two foreign languages, and submit three field papers as examples of their scholarly ability. Students will present three subjects at their qualifying examinations, a major and two minors. Upon passing the qualifying examination the student is advanced to candidacy and begins dissertation research.

Lower Division Courses

1A. Elementary Swedish. (5) Five 1-hour sessions per week. Elementary grammar, conversation. (F)

1B. Elementary Swedish. (5) Five 1-hour sessions per week. Prerequisites: 1A. Elementary grammar, conversation, easy prose reading. (SP)

*On leave, spring
|Recalled to active service
|Recipient of Distinguished Teaching Award
3A. Elementary Norwegian. (5) Five 1-hour sessions per week. Elementary grammar, conversation. (F)

3B. Elementary Norwegian. (5) Five 1-hour sessions per week. Prerequisites: 3A. Elementary grammar, conversation, easy prose reading. (SP)

4A. Elementary Danish. (5) Five 1-hour sessions per week. Elementary grammar, conversation. (F)

4B. Elementary Danish. (5) Five 1-hour sessions per week. Prerequisites: 4A. Elementary grammar, easy prose reading. (SP)

11. Intermediate Swedish. (5) Language instruction. Five 1-hour sessions per week. Prerequisites: 1B. Intermediate grammar, extensive reading, conversation, composition. (F)

13. Intermediate Norwegian. (5) Language instruction. Five 1-hour sessions per week. Prerequisites: 15 units lower division Norwegian or equivalent. Intermediate grammar, extensive reading, conversation, composition. (F)


*3A. Freshman Seminar. (3) One 3-hour seminar or two 1^-hour sessions per week. Designed to introduce students to an area of Scandinavian culture. Topics will vary from semester to semester; see departmental announcement for description. Prospective students should consult with the instructor before enrolling in the course.

75. Scandinavian Culture and Society. (3) Three 1-hour lectures/discussions per week. Course to concentrate upon four historical periods: the Viking Age, the Baroque (emphasis on Scandinavian drama and political developments), the late nineteenth century (emphasis on literary and artistic developments), and the twentieth century (emphasis on the politics and culture of the welfare state). (F) Larson

Upper Division Courses

101. Advanced Swedish. (5) Language instruction. Five 1-hour sessions per week. Prerequisites: 11 or the equivalent. Grammar review, reading, conversation, composition. (SP)

103. Advanced Norwegian. (5) Language instruction. Five 1-hour sessions per week. Prerequisites: 13 or the equivalent. Grammar review, reading, conversation, composition. (SP)

104. Advanced Danish. (5) Language instruction. Five 1-hour sessions per week. Prerequisites: 14 or the equivalent. Grammar review, reading, conversation, composition. (SP)

107. Plays of Ibsen. (3) Three 1-hour lectures/discussions per week. Reading and discussion of Ibsen's major plays. (F)

108. Strindberg. (3) Three 1-hour lectures per week. Reading and discussion of Strindberg's major works; emphasis on his dramas and their significance. (F) Nylander

115. Studies in Drama and Film. (3) The course may be repeated for credit with consent of instructor. Three hours of lecture/discussion per week. Formerly Scandinavian 109 and 189. Variable subject matter; see departmental announcement for description. Sample topics: Scandinavian drama; history of cinematic representation, films of Ingmar Bergman and Carl Th. Dreyer. All readings in translation. (SP) Clover, Sanders

116. Studies in Prose. (3) The course may be repeated for credit with consent of instructor. Three hours lecture/discussion per week. Formerly Scandinavian 110, 112, 114, 175. Variable subject matter; see departmental announcement for description. Sample topics: Henrik Ibsen, Knut Hamsun, Hans Christian Andersen, and other storytellers. All readings in translation. (F,SP) Staff

117. Studies in Poetry. (3) The course may be repeated once for credit, with consent of instructor. Three hours of lecture/discussion per week. Prerequisites: Reading knowledge of Danish, Norwegian, or Swedish. Formerly Scandinavian 146. Variable subject matter; see departmental announcement for description. Reading, critical analysis, and interpretation of Scandinavian poetry and versification from the seventeenth century to the present. Sample topics: the lyric, historical romanticism; forms and genres; particular historical periods. (SP) Larson

120. The Novel in Scandinavia. (3) Course may be repeated for credit. Three 1-hour lectures/discussions per week. Reading and discussion of the great Scandinavian novels; the development of the novel. (SP) Nylander, Sanders

*123. Viking and Medieval Scandinavia. (3) Three 1-hour lectures/discussions per week. Prerequisites: 15 units lower division Swedish or equivalent. Formerly Scandinavian 141A, 143A, 144A. Introduction to Swedish, Norwegian, and Danish literature. Reading and analysis of representative works from the eighteenth and early mid-nineteenth centuries. (SP) Larson

125. Studies in Prose. (3) Three 1-hour lectures per week. Scandinavian society, history, and culture from the Reformation through the Enlightenment. (F) Larson

128. Scandinavia From 1800-1950. (3) Three 1-hour lectures per week. Formerly Scandinavian 116. Reading and analysis of representative works from 1800 to 1950. (F,SP) Larson

140. Introduction to Danish, Norwegian, and Swedish Literature: 1700-1850. (3) Three 1-hour discussion and lecture sessions. Prerequisites: 15 units lower division Swedish or equivalent. Formerly Scandinavian 141B. Reading and analysis of representative works from 1700 to World War II. (F) Nylander

143. Introduction to Norwegian Literature. (3) Three 1-hour lectures/discussion per week. Prerequisites: 15 units lower division Danish or equivalent. Formerly Scandinavian 143B. Reading and analysis of representative works from 1900 to the present. (F)

144. Introduction to Danish Literature. (3) Three 1-hour lectures per week. Prerequisites: 15 units lower division Danish or equivalent. Formerly Scandinavian 144B. Reading and analysis of representative works from 1879 to the present. (F) Sanders

145. Senior Seminar. (2) Course may be repeated for credit. One 2-hour meeting per week. Prerequisites: 141A-141B, 143A-143B, or 144A-144B. Intensive study of a single topic, several reports, a longer paper. (F,SP) Staff

149. Major Studies. (1) One 1-hour discussion section 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 107, 108, 115, 116, 120, 165. Students attend lectures and do all written work in the "main" course and also read assignments in the Scandinavian languages and write a short paper. (F,SP) Staff

150. Studies in Scandinavian Literature. (3) Three 1-hour lectures. Variable subject matter; see departmental announcement for description. Sample topics: Scandinavian Romanticism; the Modern Breakthrough; literature by and about women in the political tradition. (F,SP) Larson, Nylander, Sanders

160. Scandinavian Myth and Religion. (3) Three 1-hour lectures per week. Religious beliefs and practices during the Viking Age in Scandinavia and their manifestations in later recordings. (F) Lindow

165. Scandinavian Folklore. (3) Three 1-hour lectures per week. Scandinavian folklore, emphasizing oral narrative traditions (legends and folk belief, folklore as courtly literature). Such minor verbal forms as proverbs, riddles, and formulas will also be considered. (F) Lindow

170. Arctic Folklore and Mythology in Nordic lands. (3) Three 1-hour lectures per week. Survey of the folklore and mythology of the principal non-Scandinavian peoples of the Nordic lands: Saami, Greenland Inuit. Comparative evidence from other circumpolar traditions and from ancient and modern Scandinavian tradition. (SP)

198. Group Study for Advanced Undergraduates. (2-4) Course may be repeated for credit. Directed study. Must be taken on a pass/fail basis. Prerequisites: Two years study of one Scandinavian language. Advanced readings and interpretation of Scandinavian texts. (F,SP)

199. Independent Study and Research. (2-4) Course may be repeated for credit. Directed study. Must be taken on a pass/fail basis. Prerequisites: Two years study of one Scandinavian language. Courses in Scandinavian literature, culture, or history. Supervised study; restricted enrollment. (F,SP)

Graduate Courses

200. Introduction to Graduate Study in Scandinavian. (3) Two 1^-hour sessions per week. Formerly Scandinavian 200A and 200B. A problem-oriented course concerned with major areas of graduate study in Scandinavian: linguistics and philology, folklore, history, literary criticism. (SP) Staff

201A. Old Norse. (3) Three 1-hour lectures per week. An introduction to the language of medieval Iceland and Norway. Grammar, historical phonology, and texts. (F) Clover, Lindow

201B. Norse Literature. (3) Three 1-hour lectures per week. Prerequisites: 201A or the equivalent. Literary production of early Iceland and Norway. Reading of representative texts in the original. (SP) Clover, Lindow

202. Medieval Scandinavian Literature. (3) Two 1^-hour lectures per week. Laws, historical writings, courtly works, Saxo Grammaticus, ballads. Emphasis on Denmark and Sweden. (SP) Staff

205. Studies in Philology and Linguistics. (3) The course may be repeated for credit. Three hours of lecture per week. Formerly Scandinavian 205 and 260. Variable subject matter; see departmental announcement for description. Sample topics: runology; history of the Scandinavian languages; dialectology. (F) Larson

220. Early Scandinavian Literature. (3) Two 1^-hour meetings per week. Formerly Scandinavian 208 and previous 220. Variable subject matter; see departmental announcement for description. Course normally focuses on one major area: Eddic and early poetry; sagas (royal family, legendary, courtly, episcopal); (SP) Clover, Lindow

221. Early Scandinavian History and Culture. (3) Course may be repeated for credit. One 3-hour seminar per week. Historical topics from the Viking Age to the Reformation; emphasis on extraliterary sources. (F) Clover, Lindow

230. Reformation Through the 18th Century. (3) Two 1^-hour lectures per week. Reading and analysis of representative literary and cultural works. (F) Larson

235. Studies in Romanticism and Realism. (3) The course may be repeated for credit. One 3-hour meeting per week. Formerly Scandinavian 235 and previous 235. Variable subject matter; see departmental announcement for description. Reading and analysis of representative works. (F) Nylander, Sanders

240. Modern and Contemporary Scandinavian Literature. (3) The course may be repeated for credit. Three 1-hour lecture/discussion per week. Reading and analysis of representative works. Topics vary from semester to semester; see departmental announcement for description. (F) Nylander, Sanders
Science and Mathematics Education

(College of Letters and Science)

Group Office: 4533 Tolman Hall, 542-4206

Faculty:

Mary Elizabeth Brenner, Ph.D. University of California at Irvine. Studies on education; development of mathematical cognition; family studies of early literacy; teaching for problem-solving. (Psychology)

Martin V. Covington, Ph.D. University of California at Berkeley. Classroom learning dynamics, student motivation and self-regulated thinking. (Psychology)

Maria D. Diamond, Ph.D. University of California at Berkeley. Neural basis of attention and executive functioning. (Psychology)

C. Michael Dumas, Ph.D. University of California at Berkeley. Science and mathematics education research; critical evaluation of published research papers; and development of proposal writing research projects; basic research on science and mathematics education. (Psychology)

Jennifer White, University of California at Berkeley. Science in education: individual learning science in an information setting. (Dir. of Exhibits, 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 and engineering, mathematics with the pursuit of central interests 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 and thesis work, students will obtain the degree of Ph.D. in science (or 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, computer science and engineering, mathematics with the pursuit of central interests 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 and thesis work, students will obtain the degree of Ph.D. in science (or mathematics) education.

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. One 2-hour meeting per week. Prerequisites: Consent of Instructor. Practical experience on an educational research or development project on campus or elsewhere for 8-12 hours per week. May be repeated for credit. (F,SP)

211. Cross-Cultural Cognition and Learning. (3) One 3-hour lecture per week. This course will examine cognition and learning as culturally and contextually mediated activities in social interactions. Course requirements may be repeated for credit. 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 interactions, research on cognition tends to focus on the intra-individual level. This course explores the social dimension of cognition in the contexts of mother-child dyads, peer teaching, and teacher-student 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 teaching. (F)

230A. Introduction to the Psychological Bases for Science and Mathematics Educ. (3) One 3-hour 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.

230B. Research Design in Science and Mathematics Education. (3) One 3-hour 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 proposal and research project, basic research on science and mathematics education. (SP)

230C. Instructional Design in Science and Mathematics Education. (3) One 3-hour lecture/discussion per week. Prerequisites: 220B or consent of the Instructor. Survey of literature on design of instruction in science and mathematics and 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) May be repeated for credit. Two hours of meetings and three hours of laboratory per week. Prerequisites: One course in programming, Design and implementation of human-computer computer systems. Software, hardware, and cognitive aspects of communication. Use of computer systems, windows, computer languages, and knowledge representation. Implications for the design of instructional computer systems. (SP)

292. Research Seminar and Colloquium. (1) Course may be repeated for credit. One 2-hour lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Discussion of current education research carried on by students, faculty, and guest speakers. A written analysis of several presentations required. (F,SP)

294. Formulation of Educational Research. (1-3) Course may be repeated for credit. One unit of credit for each four hours of student effort per week. One 2-hour meeting per week. Prerequisites: Consent of instructor. Development of thesis proposal under supervision of faculty member. (F,SP)

*On leave, spring

**Recipient of Distinguished Teaching Award
295. Research. (1-12) Course may be repeated for credit. One unit of credit each four hours of student effort per week. Individual conferences. Prerequisites: Consent of instructor. Independent research activities under supervision of a faculty member. (F,SP)

299. Individual Reading and Study. (1-5) Course may be repeated for credit. One unit of credit for each four hours of student effort per week. Individual conferences. Prerequisites: Consent of instructor. Individual reading and study under the supervision of a faculty member. (F,SP)

602. Individual Study for Qualifying Examination. (1-6) Course may be repeated for credit. Course may not be used to meet degree, comprehensive exam or requirements for the degree, individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study, under the supervision of a faculty member, designed to prepare the student for Ph.D. qualifying examination. (F,SP)

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**Slavic Languages and Literatures**

(College of Letters and Science)

**Department Office:** 5416 Dwinelle Hall, 642-2979

**Professors:**
- Ronelle Alexander, Ph.D. Harvard University. Yugoslav literature, Slavic Studies.
- Boris Gasparov, Ph.D. Academy of Sciences, Minsk. Semiotics, Slavic linguistics.
- Olga Rassam, Ph.D. University of California. Russian literature.
- Robert P. Hughes, Ph.D. University of California. Russian and East European modernism.
- Simon Kervin, Ph.D. University of California. Russian and Soviet linguistics.
- Walter Scheman, Ph.D. University of Frankfurt. Czech language and literature.
- Henryka Yakushev, Ph.D. Moscow State University. Romance linguistics.

**Associate Professors:**
- David A. Frick, Ph.D. Yale University. Polish language and literature.
- Irina Paperno, Ph.D. Stanford University. Russian literature.

**Senior Lecturers:**
- Olga Astrov, M.A. University of California. Russian language and literature.
- Hrynkya Yakush, Ph.D. Moscow State University. Russian, Polish, teaching methodology.
- Sergei Kasadash, M.A. (Emeritus)
- Olga Safrin-Vasiliev, Ph.D. (Emeritus)

**Lecturers:**
- Arkady Alexeev, Ph.D. University of California. Russian language, Slavic linguistics.

**Major Advisers:**
- MS. Alexander, MS. Nichols.

**Graduate Advisers:**
- MS. Grossman. (Literature, Mr. Timberlake. (Linguistics.)

The Department of Slavic Languages and Literatures offers courses in several Slavic languages and literatures and in Slavic linguistics, both for those pursuing the department's own degree programs and for interested students from other disciplines. Many of its literature courses require no knowledge of any foreign language. Courses in non-Slavic European languages, specifically Georgian, Hungarian, and Lithuanian, are available as staffing permits. Instructors' course descriptions with reading lists and prerequisites are posted quarterly in the Undergraduate Advising Office.

**Slavic House** is a campus residence for 18 undergraduate and graduate students who are studying a Slavic language (though their major need not be in the Slavic Department). Preference for residence is given to those who have completed one year of study of a Slavic language. A program of lectures, films, field trips, and discussions on Slavic cultures is conducted throughout the year. Information about Slavic House residence and activities is available in the department office.

**Major Programs**

Most undergraduate programs emphasize Russian, but students may choose Czech, Polish, or Serbian-Croatian as their special field of study. For all students the major includes an introduction to the cultural and the literatures of other Slavic peoples and requires at least an elementary knowledge of one additional Slavic language. Prospective majors normally complete at least one year of language study and two literature courses (in the case of Russian-emphasis majors) before declaring the Slavic major.

**Lower Division**
- 295. Research. (1-12) Course may be repeated for credit. May be used to meet degree or requirements for the minor. Individual conferences. Prerequisites: Consent of instructor. Independent research activities under the supervision of a faculty member. (F,SP)

**Upper Division**
- 27-28 units. Emphasis on Russian: course sequence 103A, courses 120, 130, 181 and one of the following: courses 152A, 152B, 162, 172, 173, 174; courses 25A-25B, 25A-26A, or 27A-27B; two of the following courses: 237, 38, 39, 46. A 3.0 grade-point average is required in the four Slavic courses completed for declaration of major.

**Certificate in Russian and East European Studies**

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 advisor. See the index and the graduate assistant for additional information.

**Admission to Graduate Study**

Candidates for higher degrees must have completed the 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 Eastern European intellectual history are useful for candidates in literary studies; for those in linguistics, preparation in French, German, Greek, or Latin, and in general and comparative linguistics is desirable.

New students admitted to the Ph.D. program with a minor in Slavic or a related field from another institution are required to pass this department's M.A. comprehensive examinations for permission to proceed to the Ph.D. program. 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 demonstrations of aptitude for advanced work.

**Graduate Programs**

M.A. and Ph.D. programs are offered in Russian, Polish, Czech, and Serbo-Croatian, each with an emphasis in literature or linguistics. Detailed descriptions of requirements are available from the department. Both the M.A. and Ph.D. degrees require work in two Slavic languages or literatures, of which one must be Russian. Three Slavic languages are required of linguists in the Ph.D. program.

**M.A. Course Requirements, Literature Program:**

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 Eastern European intellectual history are useful for candidates in literary studies; for those in linguistics, preparation in French, German, Greek, or Latin, and in general comparative linguistics is desirable.

**M.A. Course Requirements, Literature Program:**

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 Eastern European intellectual history are useful for candidates in literary studies; for those in linguistics, preparation in French, German, Greek, or Latin, and in general comparative linguistics is desirable.
### Ph.D. Requirements. 
**Literature:** The Ph.D. program in Slavic literature consists of 1) a course of study on the history of the major Slavic literature to include the medieval period, the cultural context of the major literature, and the relationship of the major literature to other European literatures. Twentieth-century Slavic literary theory. History of a second Slavic literature. One semester at the advanced level of a second Slavic language. 2) An extended written research project under faculty supervision and evaluation on a topic relevant to the student's field of study and interests. 3) Written and oral Ph.D. examinations. 4) A dissertation.

**Linguistics:** The Ph.D. program in Slavic linguistics consists of 1) 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 seminars of a third Slavic language. 2) Additional courses in two of the three fields of specialization—grammatical analysis and theory, structural and cultural history of major language, and comparative philology. 3) An extended written research project under faculty supervision and evaluation. 4) Written and oral Ph.D. examinations. 5) A dissertation.

All candidates for the Ph.D. must pass a written and oral examination in their major Slavic language and departmental French and German reading examinations.

**Instruction in teaching methodology** is provided for graduate student instructors and prospective teachers of Russian, Polish, Czech, and Serbo-Croatian.

### Czech

#### Lower Division Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
<th>Units</th>
<th>Hours of Meeting</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>26A-26B. Introductory Czech. (5,5)</td>
<td>26A is prerequisite to 26B. Beginner's course. Sequence beginning Fall. (F,SP) Staff</td>
<td>10</td>
<td>5 hours of lecture per week</td>
<td>Formerly 26A and 26B.</td>
</tr>
</tbody>
</table>

#### Upper Division Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
<th>Units</th>
<th>Hours of Meeting</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>161A-161B. Advanced Czech. (4,4)</td>
<td>115A is prerequisite to 116B. Formerly 116A and 117A. Sequence beginning Fall semester. (F,SP) Schamschula</td>
<td>8</td>
<td>4 hours of lecture per week</td>
<td>Formerly 115A and 116B.</td>
</tr>
</tbody>
</table>

**160. Survey of Czech Literature.** (3) Three 1-hour lectures per week. Outline history of Czech literature from the tenth century to the present, including major lyric literature of the fourteenth century, the National Revival of the sixteenth century, and the modern period. No knowledge of Czech required. Schamschula

**161. Readings in Czech Literature.** (4) Course may be repeated for credit with consent of instructor. Three hours of meeting per week. Prerequisites: 116A. Selected readings in Czech, tailored to the advanced interests of students enrolled. Schamschula

**162. Topics in Czech Language and Literature.** (3) Course may be repeated for credit with consent of instructor. Three hours of meeting per week. Prerequisites: 116A. Selected readings in Czech, tailored to the advanced interests of students enrolled. Schamschula

### Polish

#### Lower Division Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
<th>Units</th>
<th>Hours of Meeting</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>25A-25B. Introductory Polish. (5,5)</td>
<td>25A is prerequisite to 25B. Beginner's course. Sequence beginning Fall. (F,SP) Staff</td>
<td>10</td>
<td>5 hours of lecture per week</td>
<td>Formerly 25A and 25B.</td>
</tr>
</tbody>
</table>

**Upper Division Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
<th>Units</th>
<th>Hours of Meeting</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>115A-115B. Advanced Polish. (4,4)</td>
<td>114A is prerequisite to 115B. Formerly 108 and 109A. Sequence beginning Fall semester. (F,SP) Yakushev</td>
<td>8</td>
<td>4 hours of lecture per week</td>
<td>Formerly 114A and 115B.</td>
</tr>
</tbody>
</table>

### Russian Language

#### Lower Division Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
<th>Units</th>
<th>Hours of Meeting</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Elementary Russian. (5)</td>
<td></td>
<td>5</td>
<td>5 hours of lecture per week</td>
<td>Formerly 1 and 2.</td>
</tr>
<tr>
<td>2. Elementary Russian. (5)</td>
<td></td>
<td>5</td>
<td>5 hours of lecture per week</td>
<td>Formerly 3 and 4.</td>
</tr>
<tr>
<td>3. Intermediate Russian. (5)</td>
<td></td>
<td>5</td>
<td>5 hours of lecture per week</td>
<td>Formerly 5 and 6.</td>
</tr>
<tr>
<td>4. Intermediate Russian. (5)</td>
<td></td>
<td>5</td>
<td>5 hours of lecture per week</td>
<td>Formerly 7 and 8.</td>
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</table>

**13. Russian Conversation.** (2) May be repeated for credit once, up to a total of 4 units. Two 1-hour meetings and 1 hour of discussion laboratory per week. Prerequisites: 1 or 2 (which may be taken concurrently). Life and language in the Russian's world. (F,SP) Staff

**14. Self-Paced Russian.** (1-5) Individual conferences and laboratory. Self-paced course equivalent to Slavic 1 through 4 or Slavic 21A-21B. Prerequisites: 1 or 2. May be repeated for a total of five units. The student's program, including this course, must meet the minimum study-list requirement. Units beyond those contracted for are made up of credits. (F,SP) Staff

### Russian Literature

#### Lower Division Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
<th>Units</th>
<th>Hours of Meeting</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>39. Great Writers of Russian Literature.</em>* (3)</td>
<td></td>
<td>3</td>
<td>3 hours of lecture per week</td>
<td>Formerly a portion of 39.</td>
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</table>

**45. Nineteenth-Century Russian Literature.** (3) Three hours of lecture per week. Formerly a portion of 45 and a portion of 46. Development of Russian literature from Pushkin to Chekov. No knowledge of Russian required. Prerequisite to admission to the Slavic major and recommended for prospective graduate students. (SP) Staff

**46. Twentieth-Century Russian Literature.** (3) Three hours of lecture per week. Formerly a portion of 46 and 47. Development of Russian literature from 1900 to the present: modernism, Soviet and emigre literature. No knowledge of Russian required. Prerequisite to admission to the Slavic major and recommended for prospective graduate students. (SP) Staff

### Upper Division Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
<th>Units</th>
<th>Hours of Meeting</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>101. Practical Russian Phonetics. (2)</td>
<td></td>
<td>2</td>
<td>2 hours of lecture per week</td>
<td>Formerly 101.</td>
</tr>
</tbody>
</table>

### Other Courses

- **On leave, spring**
- **Recalled to active service**
- **Recipient of Distinguished Teaching Award**
*134B. Turgenev 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. Grossman

134C. Dostoevsky. (3) 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) Grossman

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. McLean

134E. Chekhov. (3) Three hours of lecture per week. Studies in the great master of the modern short story and drama. (F,SP) Karlinsky, McLean

*134N. Studies in Russian Literature. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Variable subject matter; see Departmental announcement for description. R. Hughes

*135. Masterworks of Russian Drama. (3) Three hours of lecture per week. Development of Russian drama from its pre-literate forms through seventeenth-century religious drama, chivalric and neoclassical plays of the eighteenth century, the nineteenth-century realistic and romantic drama, and symbolist and absurdist plays of the twentieth-century. Karlinsky

*180. 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. Required for Russian-emphasis majors. (F,SP) R. Hughes, Karlinsky

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) Karlinsky, McLean

188. Russian Prose. (4) Course may be repeated once for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 102B (may be taken concurrently). Course conducted in Russian. Reading, analysis, and interpretation of representative authors from the nineteenth century to the present. (F) O. Hughes

Serbo-Croatian

Lower Division Courses

27A-27B. Introductory Serbo-Croatian. (5,5) Five 1-hour meetings per week. Prerequisites: 27A is prerequisite to 27B. Beginner's course. Sequence beginning Fall semester. (F,SP) Staff

Upper Division Courses

117A-117B. Advanced Serbo-Croatian. (4,4) Three hours of meeting per week. Prerequisites: 27B is prerequisite to 117A; 117A is prerequisite to 117B. Formerly 112 and 113A. Sequence begins Fall semester. (F,SP) Gurup

170. Survey of Yugoslav Literatures. (3) Three hours of lecture per week. Outline of major developments in Serbian (including Montenegro) and Croatian (including Dalmatian) literatures from the beginnings to the present. No knowledge of Serbo-Croatian required. (F,SP) Staff

171. Readings in Yugoslav Literatures. (4) Course may be repeated for credit with consent of instructor. Three hours of meeting per week. Prerequisites: 117A. Selected readings in Serbo-Croatian, tailored to the academic interests of students enrolled. Alexander

172. Topics in Serbo-Croatian Literature. (3) Course may be repeated for credit with consent of instructor. Three hours of meeting per week. Prerequisites: 117A (may be taken concurrently). Studies in Serbo-Croatian literatures or linguistics, or conversation, depending on the needs of the students enrolled. Alexander

179. Contemporary Yugoslav Short Story and Novel. (4) Three hours of lecture per week. Close reading of the prose works of selected contemporary Yugoslav authors such as Andric and Krsje. Alexander

General and Other Slavic

Lower Division Courses

*111. Bulgarian. (3-6) Course may be repeated for credit up to 6 units. Variable. Prerequisites: Permission of the instructor required. Formerly 11A-11D. Practical instruction in the Bulgarian literary language with an emphasis on attaining reading skills. Content will vary according to student needs. Course offered only as permitting. Alexander

137. Languages and Peoples of Eastern Europe. (3) Three hours of lecture per week. An introduction to Eastern Europe (including the USSR), its languages and language families, and cultures. No knowledge of a foreign language required. (F,SP) Staff

*137W. Writing Workshop. (2) Two hours of lecture/discussion per week. Prerequisites: 1A portion of R&G Requirement (Co-requisite: Slavic 37). Writing-intensive workshop to accompany Slavic 37. Foreign language not required. Open only to students who have already satisfied the 1A, but not the 1B portion of the R&G requirement. Course satisfies 1B portion. Must be taken together with Slavic 37. Writing, discussion of writing, and critical reading divided among the major expository genres and major fields of cultural analysis. (F,SP) Nichols

36. Seminar for Lower-Division Students. (3) Course may be repeated for credit. Three hours of class meeting per week. Variable topics involving the cultural histories, languages, or literatures of Slavs. Coursework will include library research and one or more papers. No knowledge of a foreign language 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

*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 Slavic language or consent of instructor. An introduction to Slavic languages, their structures and histories, and descriptive and theoretical principles for their analysis. The origin and ancient history of the Slavic. Nichols

141. Polish-Russian Literary and Cultural Relations. (3) Three 1-hour lectures per week. Survey of the mutual relations between the Polish and Russian literary and cultural traditions from the Middle Ages to the present. Special attention on the key periods of the Counter-Reformation and Romanticism. The origin and development of persistent cultural cliches will be traced with a view to understanding present-day conflicts. Frick

147. Slavic Folklore. (3) Course may be repeated for credit once with permission of instructor. Three hours of lecture per week. Oral traditional literature (tales, epics, lyrics, proverbs) of one or more Slavic countries. Customs, beliefs, and other forms of folklore may also be discussed. No knowledge of a foreign language required. (F,SP) Alexander

149. Theory and Practice of Translation. (3) Three 1-hour lectures per week. Prerequisites: Reading knowledge of at least one foreign language. Lectures and assigned readings on translation theory. Critical reports on selected English prose translations. Class discussions of translations prepared by members of the staff. Staff

H135. Honors Seminar. (4) Individual conferences. Prerequisites: Overall and major grade point average of 3.0. Study and research with an advisor. Course may be taken in consultation with the faculty advisor, to culminate in the writing of a thesis. See Departmental description of the Honors Program. (F,SP) Staff

197. Field Studies. (1-4) Course may be repeated for credit. Two hours of field work per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Supervised field programs involving experiences in school-related activities. Regular individual meetings with faculty sponsor and written reports required. (F,SP) Nichols

189. 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

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Overall GPA of 3.0. (F,SP) Staff

Slavic

Graduate Courses

200. Graduate Colloquium. No credit. Must be taken on a satisfactory/unsatisfactory basis. Reports on current scholarly work by faculty and graduate students. (F,SP) Staff

201. Advanced Russian Proficiency Maintenance. (2-3) Course may be repeated for credit. Three hours of meetings per week. Prerequisites: Graduate standing; 103B or equivalent; consent of instructor. Advanced work in speaking, writing and comprehension in order to develop and maintain superior proficiency. Discussions and readings will focus on current cultural and political trends and other topics pertaining to Slavic studies. Special attention to the details of contemporary Soviet life and its changing colloquial speech. Conducted in Russian. (F,SP) Staff

202. Advanced Russian Readings for the Social Sciences. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 102 and 103B, or equivalent; Second-year background; consent of instructor. Development of skills for reading expository and scientific Russian texts: understanding of content; vocabulary and usage; logical organization and paragraph structure; knowledge of syntactic patterns of Russian scientific text, word-formation and rhetorical devices; argument evaluation, scanning and skimming. Texts from technical literature of the social sciences. Topics(s) and field(s) will vary according to student needs. Conducted partly or wholly in Russian. (F,SP) Staff

204. Russian Composition and Style. (3) Three hours of meeting per week. Prerequisites: 103B. Essay-writing, analysis of texts, oral and written reports, and translation. (F,SP) Gasparov

210. Old Church Slavic. (3) Three hours of meeting per week. Prerequisites: Reading knowledge of a modern Slavic language or consent of instructor. Introduction to Old Church Slavic, with special attention to traditional morphology. Assigned translations and sight reading of selected texts. (SP) Frick

214. Medieval Orthodox Slavic Texts. (3) Three hours of meeting per week. Prerequisites: 210. Assigned translations and sight reading of selected Medieval Orthodox Slavic texts. (F) Frick

221. Sound Patterns of Russian. (2-3) Three hours of lecture per week. Prerequisites: 103B or equivalent. Survey of sound patterns of contemporary Russian, divided into three sections of five weeks each: (a) segmental phonology; (b) stress and intonation; and (c) metrics and versification. Course may be taken either for two units (any two of the three sections) or three units (three sections). (SP) Gasparov

222. Descriptive Grammar of Slavic Languages. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Knowledge of the language. Survey of morphology and syntax of a contemporary Slavic language (Czech, Polish, Russian, or Serbo-Croatian) with attention to theoretical models; see Departmental announcement for topic. Recommended for prospective teachers. (SP) Gasparov, Nichols, Timberlake

223. Advanced Structure of Slavic Languages: Grammatical Analysis and Theory. (3) The course may be repeated for credit. Three hours of lecture per week. Prerequisites: 208. Analysis of synchronic grammar and structure of discourse of a Slavic language (Czech, Polish, Russian, or Serbo-Croatian); see Departmental announcement for topic. Nichols, Timberlake

230. Historical Grammar of Slavic Languages. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 210. Historical phonology, morphology, and syntax of a Slavic language (Czech, Polish, Russian, or Serbo-Croatian); see Departmental announcement for topic. Nichols, Timberlake

231. History of Slavic Literary Languages. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 208. Advanced knowledge of the modern languages: 210 and 214 at least one advanced or graduate level literature course. Analysis of language and style of a Slavic literary language (Czech, Polish, Russian, or Serbo-Croatian). Some coverage of dialectology. See Departmental announcement for topic. Nichols, Timberlake

233. West Slavic Linguistics. (3) Three hours of lecture per week. Prerequisites: 220. Linguistic history and dialectology of Czech, Polish, and lesser known West Slavic languages (Slovak, Sorbian, Kashubian, Polabian). Timberlake

234. South Slavic Linguistics. (3) Three hours of lecture per week. Prerequisites: 220. Linguistic history and dialectology of Slovenian, Bulgarian, Macedonian, and Serbo-Croatian. (F) Alexander

239. Twentieth-Century Slavic Literary Theory. (3) Three hours of lecture & discussion per week. Prerequisites: 281/282, 221, one of following: 245/246/287; approval of instructor. Attempts to describe literary forms, poetic usage of language, and cultural infrastructure, as a code, examined as a consistent trend in 20th-Century literary theory. Consideration of this scholarly trend in historical perspective; its sources, evolution, and eventual dissipation. Gasparov

240. Russian Oral Tradition. (3) Three hours of lecture per week. Prerequisites: Much of the reading is in non-standard Russian and requires a good command of the language. Major emphasis will be placed on the epics (byliny), but other forms of orally transmitted literature will also be discussed. McLean

241A-241B. Old Russian Literature. (3,5) Three hours of lecture per week. Prerequisites: Reading knowledge of Old Russian. Early Russian literature from the beginnings to 1700. A. Kievan and early Muscovite literature. B. Late Muscovite and seventeenth-century Russian literature. McLean

242. Eighteenth-Century Russian Literature. (3) Three hours of lecture per week. Prerequisites: Reading knowledge of Old Russian. Early Russian literature from 1700 to the end of the century. McLean

243. The Russian Novel and Literatures of Western Europe. (3) Three hours of lecture per week. The development of the nineteenth-century Russian novel and its sources in and links with Western literary works and movements. (F,SP) Grossman

245A. Russian Sentimentalism and Romanticism (1790s-1840s). (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor - adequate knowledge of Russian. Coverage of major movements and genres in the intellectual context of the times. Readings in Russian. Staff

245B. Russian Realism (1840s-1900). (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor - adequate knowledge of Russian. Coverage of major movements and genres in the intellectual context of the times. Readings in Russian. Paperno

246A. Russian Modernism (1890s-1920s). (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor - adequate knowledge of Russian. Coverage of major movements and genres in the intellectual context of the times. Readings in Russian. (SP) R. Hughes

246B. Contemporary Russian Literature (1920-present). (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor - adequate knowledge of Russian. Coverage of major movements and genres in the intellectual context of the times. Readings in Russian. Paperno

255. Slavic Oral Epic. (3) Three 1-hour lectures per week. Prerequisites: Graduate standing or consent of instructor. Advanced knowledge of either Serbo-Croatian or Russian. A comparison of Russian and South Slavic oral epic. Stylistic and poetic analysis of Serbo-Croatian and Russian texts with special attention to Fairy-Land oral formulaic technique. (SP) Alexander, McLean

270. South Slavic Oral Tradition. (3) Three hours of lecture per week. Oral epic songs of the South Slavs. Alexander

280. Studies in Slavic Literature and Linguistics. (3) Course may be repeated for credit. One 2-hour seminar per week. Advanced study in the several fields of Slavic literatures and linguistics. Content varies. (F,SP) Frick

280.25. Aims and Methods of Literary Scholarship. (3) Three hours of seminar per week. Course designed for new graduate students in literature. Introduction to modern literary theory and criticism; principles of textual analysis; methods of bibliographical research. (F) R. Hughes, Grossman

280.26. Aims and Methods of Linguistic Scholarship. (3) Three hours of seminar per week. Course designed for new graduate students in Slavic linguistics. A survey of general and Slavic linguistics, Slavic philology, semantics, and the relation of linguistic to literary studies. Methods of research and critical analysis. Current issues and goals of research. (F) Gasparov, Timberlake

285. Eastern Christianity: History and Thought. (3) Three hours of lecture per week. Survey of the religious history and thought of Eastern and the Levant with an intent of providing greater insight into the shaping of faith and cultures of both halves of Europe. (SP) Staff

287. Russian Poetry. (3) May be repeated with consent of instructor. Three hours of lecture per week. Prerequisites: Open to qualified undergraduates. Class conducted in Russian. Russian poetry and verification (eighteenth, nineteenth and twentieth centuries); close readings of texts. Variable topics. (F) O. Hughes

289. Directed Research. (2-12) Course may be repeated for credit. Individual conferences. Preliminary exploration of a restricted field involving research and a written report. (F,SP) Staff

601. Individual Study for Master's Students. (2-6) Course may be repeated to a maximum accumulation of 16 units. May not be used to satisfy unit or residence requirements for a master's degree. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Individual study for the comprehensive or language requirements in consultation with a field adviser. (F,SP) Staff

602. Individual Study for Doctoral Students. (2-6) May not be used for unit or residence requirements for the doctoral degree. Course may be repeated for credit for a maximum of 16 units. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with a major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (F,SP) Staff

Professional Courses

301. Slavic Teaching Methods. (3) Course to be repeated for credit each semester of employment. Group and individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Course on practical teaching methods, grading, testing, and design of supplementary course materials. Required of all graduate student instructors in Slavic. (F,SP) Staff

310. Internship in the Teaching of Literature/Linguistics. (1-2) Course may be repeated for credit. One 2-hour conference per week. May not be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Weekly meetings with the instructor of the designated course. Discussion of course aims, syllabus preparation, lecture and assignment planning, grading, and related matters. Students may prepare a teaching segment for work for such a course (e.g. lecture outline and assignments for a course segment) and may participate in presentation of the material and in evaluation of samples of student work. (F,SP)

East European Studies

Lower Division Courses

1A-1B. Introductory Hungarian. (5) Students who have taken 5 units of 10A will receive no credit for 1A. Students who have taken 10 units of 10A will receive no credit for 1B. Five hours of class meeting per week plus language laboratory. Prerequisites: 1A is prerequisite to 1B. Course sequence begins each Fall semester. (F,SP) Mithall

Upper Division Courses

100. Readings in Hungarian. (2) Two hours of class meeting per week. Prerequisites: 1B or equivalent. (F,SP) Mithall

Related Courses in Other Departments

For linguistics courses, please see the graduate adviser in Slavic linguistics.

For literature courses, please check with the appropriate department in addition to the graduate adviser in Slavic literature.
Social and Administrative Health Sciences

(School of Public Health)

Department Office: 513 Earl Warren Hall, 642-9441
Chair: Tef-hu Hu, Ph.D.

Professors:
Richard M. Bailey, D.B.A. Indiana University. Economics, planning, policy
Joan R. Black, Ph.D., Stanford University. Health organization; program evaluation
William H. Bickel, Ph.D. University of Denver. Health attitudes, beliefs, and behavior
Ralph A. Catsiff, Ph.D., M.P.H. University of California at Berkeley. Health, medical care systems
Leonard J. Duhl, M.D. Albany Medical College. Planning, international public health
Jeffrey B. Gould, M.D., M.P.H. University of Rochester. Preventive medicine, biostatistics, interventions
Ernest B. Hock, M.D. New York University. Genetic epidemiology, counseling

Associate Professors:
Carol D’Onofrio, Dr.P.H. University of California at Berkeley. Community mental health
Helen H. Schauffler, Ph.D. Brandeis University. Health education
James C. Robinson, Ph.D. University of California at Los Angeles. Organization and management theory
Paola S. Tellis, Ph.D. Physiology-Anatomy
Eugene Bardach, Ph.D. Public Policy
Helen H. Schauffler, Ph.D. Brandeis University. Health education

Assistant Professors:
Barbara Abrams, Dr.P.H. University of California at Berkeley. Educational interventions; health behavior
Brenda Eskenazi, M.A., Ph.D., CUNY, (Acting) Toxicology; neuroepidemiology; maternal and child health
Patricia Marks, Ph.D. University of California at San Francisco. Epidemiology, substance abuse
William A. Sataiano, Ph.D. University of California at Berkeley.  Medicine, health policy, and social work
Lawrence Wallack, Ph.D. University of California at Berkeley. Preventive medicine, social policy, alcohol and tobacco
Mary M. Murali, M.S., Ph.D. (Clinical) Epidemiology
Helen M. Wallace, M.D., M.P.H. (Emerita)

Assistants Professors:
Barbara Stocker, Ph.D. University of California at Berkeley. Community mental health
Susan A. Rabiner, Ph.D. University of California at Berkeley. Preventive medicine, health promotion

Affiliated Professors:
Eugene Bardsch, Ph.D. (Public Policy)
James M. Carman, Ph.D. (Business Administration)
Frederick C. Catsiff, Ph.D. (City and Regional Planning)
Harold S. Luft, Ph.D. (UC San Francisco)
Lorraine T. Miller, M.D. (Clinical)
Steven P. Segal, Ph.D., (Social Welfare)
Paola S. Tellis, Ph.D. (Physiology-Anatomy)

Lecturers:
Elizabeth Crawford, M.P.H.
Alan Goldberg, Ph.D.
Mark Goldstein, M.S.
Bernard Griego, M.P.H.
Rosa Gruber, M.P.H.
Sandra Hellman, Dr. P.H.
Robert A. Hosang, M.D., M.P.H.
Jeannine Jackson, M.D., M.P.H.
Jean G. Kohn, M.D., M.P.H.
Jean Morton, M.S.W., M.P.H.

Roberta O’Grady, R.N., D.P.H.
Abby M. Rinfco, M.P.H.
Sanford Sherman, M.D.
Gary J. Stewart, M.D., M.P.H.
Catherine B. Tassan, M.P.H.
Constance M. Weisner, D.P.H.

Field Program Supervisors:
Jean G. Kohn, M.D., M.P.H.
Frances S. Saunders, M.P.H.

The Department of Social and Administrative Health Sciences in the School of Public Health is concerned with the social aspects of health. The quality of life through the prevention and solving of community health problems. The scope of faculty and students in research and practice is broad. Numerous aspects of health programs and issues are studied: administrative, behavioral, educational, political, and economic.

Flexibility in the curriculum enables students to prepare themselves to pursue many possible career goals. Students may specialize in the following areas: health policy and administration, maternal and child health, genetic counseling, public health nutrition, applied behavioral sciences, and public health education. Students are urged to take an interdisciplinary approach to the study of health problems. Each program prescribes the knowledge and skills area in which competencies should be demonstrated prior to graduation.

Because of the breadth of health subject interests, graduate students are expected to make extensive use of related departments on the Berkeley campus such as: anthropology, business administration, city and regional planning, economics, education, genetics, nutritional sciences, psychology, public policy, and social welfare. Opportunities for supervised field experience are offered by many health agencies in nearby communities, the state, and the nation. For physicians, certain training programs require that all but the last year of medical school be spent in an internship or residency. Students interested in such programs are urged to consult their respective departments for information.

Course offerings include courses in the following areas:

- 00-99 Health Policy and Administration
- 40-49 Health Behavior, Social Change, Health Education, and Working with People
- 50-59 Nutrition
- 70-79 Special Population Groups and Problems
- 80-89 Research and Evaluation
- 90-99 Experimental, Seminars, Independent Study, etc.

The following sections have been established for courses 197, 198, 199, 295, 296, 297, 298, 299, 601, and 602. The courses may be repeated for credit, but some sections may not be given every semester.

A. Health Policy and Administration
B. Maternal and Child Health
C. Public Health Education
D. Behavioral Sciences
E. Public Health Nutrition

Lower Division Courses
76. Healthy People: Introduction to Health Promotion. (4) Three 1-hour lectures and one 1-hour discussion per week. Introduction to personal and community health. Basic concepts and health education approaches to disease prevention and health promotion are explored for each topic. (F)

Upper Division Courses
150. Introduction to Community Nutrition. (3) Two 1-hour lectures per week. Prerequisites: 100 or current enrollment. Topics include: Nutrition services and the U.S. health care system, nutrition problems in U.S. society, community nutrition programs, the legislative process and the role of the community nutritionist. (F)

175A-175B. Health Promotion in a College Setting. (2-2) May be repeated for credit. One 1-hour lecture per week and three 1-hour field experiences every other week. Credit and grade to be awarded upon completion of the sequence. Must be taken on a pass/no pass basis. Prerequisites: Consent of Instructor. Topics include: health promotion, mental health, substance abuse, and health education. Students will experience a variety of health promotion activities and practice approaches, topics are covered as they apply to the college community. The course is divided into three sections corresponding to particular campus environments in which students may be involved. (F,SP)

176. Issues in Personal and Community Health Promotion. (3) May be repeated for credit. Three hours of lecture-discussion and one optional 1-hour discussion section per week. Introduction to trends and issues in the educational approach to health promotion at the individual and community level. Presentation of basic information on selected topics (e.g., stress, sexuality, fitness, alcohol and drugs, environmental health), with emphasis on social and political factors that influence both the definition of health and actual health status. (F,SP)

178. Policy, Planning, and Evaluation of Health Promotion in College Setting. (3) May be repeated for credit. Three 1-hour lecture/discussion per week. Prerequisites: 76 and 175 or 176 and consent of Instructor. Theory and practice of policy, planning, implementation, and evaluation of health promotion programs in a college setting. Comparison of different methodologies (peer education, teaching, problem solving, community mobilization), content areas (stress, nutrition, alcohol and drugs, AIDS, sexuality, women’s health, self-care, health services), and settings (clinical, classroom, living room, campus). (F,SP)

191. Drugs, Health and Society. (2) Two 1-hour lectures and one 1-hour discussion per week. Introduces undergraduates to concepts basic to understanding and analyzing relationships between drugs, health and society. Using broad multi-disciplinary perspective, examines legal and illegal drugs and their effects on personal and community health. Prevention of drug problems at the policy, community, organization, and individual levels will be examined. (SP)

197. Field Study in Public Health. (1-4) May be repeated for credit. Individual variable. Must be taken on a pass/no pass basis. Supervised experience relevant to specific aspects of public health in off-campus programs. Individual meetings with faculty sponsor and written reports required. (F,SP)

198. Directed Group Study. (1-4) May be repeated for credit. Individual variable. Must be taken on a pass/no pass basis. (F,SP)

199. Supervised Independent Study and Research. (1-4) May be repeated for credit. Individual variable. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor, supervised by regulations listed in the General Catalog. (F,SP)

Graduate Courses
200. Introduction to Public Health and Health Care Systems. (2-4) Two 2-hour lectures and one 2-hour discussion section per week. An introduction to basic theoretical perspectives, health, and public health, to social forces shaping health care policy, and to fundamental components of organized health care systems as they are influenced by ethical, technological, and economic determinants. Three units for those enrolling in the context of contemporary American society. Public health approaches to disease prevention and health promotion are explored for each topic. (F)
201. Health Paradigms and Deliberate Social Change. (3) Two 1 1/2-hour lecture-discussions per week. Part I: History and current health paradigms and practices. Part II: Understanding the techniques of social change. (SP)

202. Health Policy and Planning. (3) Two 1 1/2-hour lecture-discussion sessions per week. Use of planning as a means of social change: Presentation of theories and alternative methods of planning for health. (SP)

203. Program Planning, Development and Evaluation. (3) Two 1 1/2-hour lectures per week. Approaches in community health. Basic elements and considerations in planning health programs; case material will be drawn from health settings, with emphasis on multidisciplinary planning. Assessment of problem conditions and planning objectives, designing activities, implementation and evaluation. (F,SP)

204. Health Policy Analysis and Formulation. (4) Two 2-hour lectures per week. Prerequisites: Field work in health policy and administration. Concepts and tools of policy analysis and formulation. (SP)

205. Occupational and Environmental Health Policy. (3) Two 1 1/2-hour lectures per week. Analysis of the principles underlying governmental policy in occupational and environmental health, drawing on diverse perspectives from the health sciences, law, economics, and industrial relations. Particular topics include: Environmental health, labor standards, working conditions and safety; occupational cancer; cost-benefit analysis; worker and labor union responses to hazards; the right to know; workers' compensation. (SP)

206. Health Care Organization and Policy: An International Perspective. (3) Two 1 1/2-hour lectures/discussion per week, two 1-hour seminar on selected topics will be presented. Principles of health care organization, policy, and planning in several nations throughout the world—rich and poor, capitalist and socialist, centralized and decentralized. Health systems will be analyzed within the context of the cultural, economic, and political forces within each country. (SP)

207. Health and Social Policy In Mexico and Latin American. (3) One 2-hour lecture per week. critical issues in health and social welfare policies and structures in Latin American. Various theories of development are considered and related to health and social well being. Themes are examined from a multidisciplinary perspective including demography, epidemiology, family structure, community influences, occupational health, and migration. (SP)

208. Medical Care Organization. (3) One 3-hour lecture per week. Principles of medical care organization, policy, and planning in several nations throughout the world—rich and poor, capitalist and socialist, centralized and decentralized. Health systems will be analyzed within the context of the cultural, economic, and political forces within each country. (SP)

209. The Hospital As a Social and Economic Institution. (3) Two 1-hour lectures per week. Development of the hospital as a social and economic institution: role in health care delivery, ownership patterns, governance, medical and administrative structures and operations, quality controls, financing. (SP)

210. Health Politics, Policy and Law. (3) Two 1 1/2-hour lectures per week. A multidisciplinary treatment is given to the major themes contained in the course title. Major emphasis is placed on social, scientific, and legal perspectives. Current California community hospitals and health systems serve as a basis of examples in order to develop ethical, organizational, service funding, legal, and health care dimensions and issues. (F)

211. Health Politics, Policy, and Law. (3) Two 1 1/2-hour lectures per week. A multidisciplinary treatment is given to the major themes contained in the course title. Major emphasis is placed on social, scientific, and legal perspectives. Current California community hospitals and health systems serve as a basis of examples in order to develop ethical, organizational, service funding, legal, and health care dimensions and issues. (F)

212. Legislation and Organization for Health and Social Services. (2) Two 1-hour lectures per week. Descriptive and evaluative analyses of the principles of federal health and social legislation, translation of legislation into organizational policy, and implications for planning service delivery systems. (SP)

213. Legal Basis for Health Facility Administration. (3) One 3-hour lecture-discussion per week. Statutes, cases, and readings in the legal basis for public health, medical care administration, and law related to hospitals. (SP)

214. Introduction to Health Economics. (3) Two 1 1/2-hour lecture-discussions per week. Principles of economic (macro or micro), or consent of instructor. An introduction to health economics designed to provide an overview of the field: production and utilization of health care services, health insurance, pricing, health care institutions, health care delivery, health care financing, cost-benefit analysis, issues or competition and regulation. (F)

215. Health Care Competition and Regulation. (2) One 2-hour seminar per week. Focuses on competition and regulation as alternative approaches to influencing the health care system. Particular emphasis is placed on health maintenance organizations (HMOs) and selective contracting by health insurers and state Medicaid programs, rate regulation, and Medicare's Prospective Payment System. (F)

216. Macroeconomics of Health. (3) Two 1 1/2-hour lecture/discussions per week. Prerequisites: 216 or consent of instructor. Application of basic concepts of microeconomics and public finance to the provision of health services. Alternative methods of financing health services from public and private sources are examined. (SP)

217. Advanced Health Economics. (3) One 2-hour lecture per week. Prerequisites: 216 or a recent graduate course in microeconomics. An economic analysis of the production and distribution of health care. The impact of competition and regulation of the health care industry on providers and consumers is analyzed. Economic models of health care are compared to the empirical evidence. (SP)

218. Health Information Systems. (3) One 1-hour lecture and one 2-hour discussion per week. The technical and organizational aspects of information system design and implementation. Through lectures, extensive readings and a community-based project, students learn the theory and application to small and large organizations. (SP)

219. Managerial Accounting in Health Care. (3) Two 1 1/2-hour lectures per week. Principles of managerial accounting in health care organizations, with emphasis on government and community service agencies. (SP)

220. Health Care Finance. (3-4) Two 1 1/2-hour lecture/discussions per week. Principles of financial management and regulation of health care organizations, including reimbursement, incentives, public regulation, and incorporation of financial management into organizational policy. Students who demonstrate mastery of introductory financial management may enroll for three units; others must complete an additional one-unit accounting section concurrently. (SP) Grazier

221. Advanced Financial Management and Regulation of Health Care Institutions. (3) Two 1 1/2-hour lecture/discussions per week. Prerequisites: (1) 222 or Bus Adm 203; or (2) 204 and 210. Students emphasizing management must meet prerequisite (1); those emphasizing planning/regulation must meet prerequisites (2). Financial management and regulation of health care institutions, including relationship between institutional policies with regard to reimbursement, incentive systems, public regulation, and control of health care costs. Course is based on a computer game simulation. (SP)

222. Health Care Organizations and Environments. (3) Two 1 1/2-hour lecture/discussions per week. 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 test theory to practice. (SP)

223. Advanced Organization Theory and Health Institutions. (3) Two 1 1/2-hour lecture/discussions per week. Prerequisites: An introductory graduate level course in organization theory or behavior, or consent of instructor. Bridging theory and practice in understanding and administering health and medical care organizations; inter- and intra-organizational relationships; power and control; conflict and change. (SP)

224. Advanced Health Organizations and Environments. (3) Two 1-hour lecture/discussions per week. Prerequisites: 225 or 226, or consent of instructor. Study of current approaches to the theories of innovation and change as they relate to theories of complex organizations and organizational relationships in health administration. (F)

225. Quantitative Methods for Health Policy and Administration. (4) Two 1-hour lectures, and one 2-hour discussion per week. Prerequisites: BEHS 130A, or consent of instructor. Application of quantitative methods and operations research to problems and decision-making in health service systems and facilities. Introduction of selected quantitative techniques; emphasis on identifying and formulating system problems that are amenable to solution through use of quantitative techniques. (SP)

226. Advanced Quantitative Methods for Health Policy and Administration. (2) Two hours of lecture and one hour of laboratory/discussion per week. Prerequisites: Business Administration 204B or 230 or equivalent. Selected operations research topics and applications to decision making in the health care sector. Topics include linear programming, quadratic programming, integer programming, Markov chains, and dynamic programming and simulation. (SP)

227. Research Issues in Health Services. (3) One 1-hour lecture per week. An examination of selected topics in health services research, including approaches to conceptualizing research issues on particular programs, methodological problems in planning and conducting research, and management of larger research projects. A major focus will be on the interrelationship between health services research and health policy. (F)

228. Research Methods for Health Services I. (3) Two 1-hour lectures per week. Prerequisites: 217, BEHS 130A-130B (c) to be concurrent. Review of multivariate statistical methods including time series for analyzing health services. Includes regression analysis, empirical applications, and model building. (F)

229. Research Methods for Health Services II. (3) Two 1-hour seminars/discussions per week. Prerequisites: 234 or consent of instructor. Introduces methods of large-scale model building for health care delivery systems, forecasting methods, and other multivariate methods. (SP)

230. General Theories of Social Change. (3) Two 1-hour lecture/discussions per week. A general introduction to major theories of change and practice: positivistic social theories of change, interpretive cultural theories of change, and ideological theories of change as these relate to health and human behavior. (F,SP)

231. Social Theory in Public Health. (3) Two 1-hour lecture/discussions per week. A presentation of the current theoretical and empirical analyses of the relationships among social factors and health. Major theoretical perspectives are presented as frameworks within which health is both, analyzed and discussed, including sociodemographic factors, lifestyle factors, and health system factors, and their impacts on health status. (F)

232. Behavior Theory in Public Health. (3) One 3-hour seminar per week. A critical discussion and analysis of recent developments in health-relevant psychological theories as they relate to the implementation, design, and evaluation of programs planned to improve the health status of designated groups. (SP)

233. Advanced Health Education: Theory. (3) Three hours of lecture per week. Prerequisite: Public Health Education major. The course is designed to provide a basic understanding of the theory, vocabulary, concepts, and approaches to practice that underlie the health education process. (F)

234. Advanced Health Education: Group Work. (3) Three hours of discussion/laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Pre*

235. Medical Care Organization. (3) One 3-hour lecture per week. Introduction to major the 222 223 224 225 226 227 228 229 230 231 232 233 234 235
245. Health Education in Medical Care Settings. (3) Two 1½-hour lectures/discussions per week. Prerequisites: Standing as a professional student in the field of medical care. The course will focus on issues and problems in the field of health education and will include discussions on current literature related to the field, including relevant legal issues and ethical considerations. (SP)

246. Community Organization and Concepts Basic to the Change Process. (3) One 3-hour seminar per week. Prerequisites: Consent of instructor. The course will cover the concepts and methods of community organization and change, focusing on the role of the community health worker in facilitating change processes. (SP)

247. Mass Communications in Public Health. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. The course will cover the role of mass communication in public health, including the principles of media selection and message development. (SP)

250A. Assessment of Nutritional Status. (3) Two 1½-hour lectures/discussions per week. Prerequisites: Consent of instructor. The course will focus on the assessment of nutritional status, including the use of various methods and techniques. (SP)

250B. Public Health Aspects of Nutritional Care: In Selected Facilities. (3) One 2-hour lecture-discussion per week. Prerequisites: Consent of instructor. The course will cover the role of public health nutrition in selected facilities, including hospitals and clinics. (SP)

250C. Nutrition Intervention Programs. (3) Two 1½-hour lectures/discussions per week. Prerequisites: Consent of instructor. The course will cover the design and implementation of nutrition intervention programs, including the assessment of nutritional needs and the development of effective intervention strategies. (SP)

251. Laboratory in Public Health Nutrition. (3) May be repeated for credit. One 2-hour lecture/discussion and 3 hours of field work per week. Prerequisites: Consent of instructor. The course will involve hands-on experience in public health nutrition settings, including fieldwork and laboratory exercises. (SP)

252. Current Developments in Public Health Nutrition. (3) Two 1½-hour lecture-discussions per week. Prerequisites: Consent of instructor. The course will cover current developments in public health nutrition, including new research findings and emerging trends. (SP)

253. Public Health Aspects of Maternal and Child Nutrition. (3) One 2-hour lecture-discussion per week. Prerequisites: Consent of instructor. The course will cover the public health aspects of maternal and child nutrition, including nutritional needs during pregnancy, lactation, infancy, childhood, and adolescence. (SP)

254. Nutrition and Aging. (3) Two 1½-hour lectures/discussions per week. Prerequisites: Consent of instructor. The course will focus on nutrition and aging, including the nutritional needs of older adults and the impact of aging on nutrition. (SP)

255. International Nutrition. (3) Two 1½-hour lectures/discussions per week. Prerequisites: Consent of instructor. The course will cover international nutrition issues, including the nutritional needs of populations in different regions of the world. (SP)

256. Public Health Aspects of Nutritional Care: In Selected Facilities. (3) One 2-hour lecture-discussion per week. Prerequisites: Consent of instructor. The course will cover the role of public health nutrition in selected facilities, including hospitals and clinics. (SP)

257. Family Issues, Child Care, and Public Health. (3) One 2-hour lecture-discussion per week. Prerequisites: Consent of instructor. The course will cover the role of public health nutrition in family issues and child care, including nutritional needs during pregnancy, lactation, infancy, childhood, and adolescence. (SP)

258. Group Health Education. (2,3) One 2-hour lecture-discussion per week. Prerequisites: Consent of instructor. The course will cover group health education, including the design and implementation of group health education programs. (SP)

259. Biomedical and Behavioral Aspects of Family Planning. (2) One 2-hour lecture-discussion per week. Prerequisites: Consent of instructor. The course will cover the biomedical and behavioral aspects of family planning, including the role of public health nutrition in these areas. (SP)

260. Health Education in Medical Care Settings. (2) Two 1½-hour lectures per week. Prerequisites: Consent of instructor. The course will cover the role of health education in medical care settings, including the design and implementation of health education programs. (SP)

261. Human Growth and Development: The Life Span. (2,3) One 2-hour lecture-discussion per week. Prerequisites: Consent of instructor. The course will cover human growth and development throughout the life span, including prenatal, infant, and child development. (SP)

262. International Nutrition. (3) Two 1½-hour lectures/discussions per week. Prerequisites: Consent of instructor. The course will cover international nutrition issues, including the nutritional needs of populations in different regions of the world. (SP)

263. Evaluation and Improvement of Perinatal Health: International Perspective. (3) One 2-hour lecture-discussion per week. Formerly 263B. The course is designed for students planning to do perinatal health research or to improve perinatal health care. (SP)

264. Application of Genetics to Maternal and Child Health. (3) Two 1½-hour lectures/discussions per week. Prerequisites: Consent of instructor. The course will cover the application of genetics to maternal and child health, including issues related to genetic counseling and screening. (SP)

265. Reproductive Hazards of Industrial Chemicals. (3) Two 1½-hour lectures/discussions per week. Prerequisites: Consent of instructor. The course will cover the reproductive hazards of industrial chemicals, including the effects of chemicals on fertility and pregnancy. (SP)

266. Programs and Services for Handicapped Children and Youth. (2) One 2-hour lecture-discussion per week. Prerequisites: Consent of instructor. The course will cover the development and implementation of programs for handicapped children and youth, including issues related to special education and rehabilitation services. (SP)

267. Population Dynamics, Family Planning, and Health. (2) One 2-hour lecture-discussion per week. Prerequisites: Consent of instructor. The course will cover population dynamics and family planning, including issues related to fertility control, economic development, and family planning programs. (SP)

268. Ethnic and Cultural Diversity in Health Status and Behavior. (3) One 3-hour lecture-discussion per week. Prerequisites: Consent of instructor. The course will cover the role of ethnicity and culture in health status and behavior, including issues related to cultural competence and healthcare delivery systems. (SP)

269. Health Education in Medical Care Settings. (2) Two 1½-hour lectures per week. Prerequisites: Consent of instructor. The course will cover the role of health education in medical care settings, including the design and implementation of health education programs. (SP)

270. Occupational Health Education. (2,3) One 2-hour lecture per week and 3 hours of field work. Prerequisites: Consent of instructor. The course will cover the role of occupational health education in the workplace, including issues related to workplace safety and health. (SP)
Participants from various disciplines survey current issues in occupational health: the scope of hazards; occupational illness and injury; and practical skills for planning and implementing effective occupational health programs. (SP)

276. Disease Prevention and Health Promotion for the Elderly. (3) One 2-hour lecture/discussion per week. Prerequisites: Consent of Instructor. Formerly Genetic 235A. The clinical delineation of human genetic diseases, including chromosomal abnormalities and polygenic disorders. Genetic diagnoses, clinical management, and developmental aspects of disease states. (F,SP)

278. Substance Abuse Prevention. (3) Three 1-hour lecture-discussions per week. Considers patterns of use and social responses to alcohol, tobacco, and other addictive drugs, and factors in changes in use and social response. Attention is given to the growth of community treatment systems and to preventive strategies and their effectiveness. (F,SP)

279. Problems and Programs in Mental Health. (3) Three 1-hour lecture-discussions per week. Examines historical development of mental health issues in the community; specifically policy, program goals, local needs, community mental health environment, impacts of recent budgetary policy shifts, a profile of community needs, and projections of future trends and policy options. (SP)

280. Research Methods: Logic and Design. (3) Two 1-hour lectures and group discussions per week. The study of logic, theory, concepts, and methods of behavioral research as they apply to public health. (F)

281. Research Methods: Program Evaluations. (3) Two 1-hour lecture/discussions per week. The study of concepts, methods, rationales, and uses of evaluation research as they apply to public health. (SP)

283. Advanced Methods: Field Applications. (3) One 3-hour lecture-discussion per week. Critical analysis of selected research topics in health, including approaches to conceptualizing research on particular issues, methodological problems in planning and conducting field investigations, and management of large-scale research projects. (SP)

284. Advanced Methods: Interpretive Research. (3,4) One 3-hour lecture-discussion, and one optional 3-hour lab session per week. Prerequisites: Doctoral study in Public Health or a related discipline, or consent of instructor. The study of observational and related methods used to describe and assess the health behavior and health care delivery. (SP)

285. Advanced Methods: Interviews and Questionnaires. (3,4) One 3-hour lecture-discussion, and one optional 3-hour lab session per week. Prerequisites: Doctoral study in Public Health or a related discipline, or consent of instructor. The study of interviews, questionnaires, and other methods used in health-related surveys. (SP)

286. Advanced Methods: Measures and Indices. (3,4) One 3-hour lecture-discussion per week, and one optional 3-hour laboratory session per week. Prerequisites: Doctoral student in Public Health or related discipline, or consent of instructor. The study of quantitative methods for assessing health attitudes, beliefs, and behaviors. (F,SP)

290. Health Issues Seminar. (1-4) May be repeated for credit. One 1 to 4-hour seminar per week. A discussion of current developments and issues in public health of interest to faculty and students of the Department as a whole. Content varies from year to year, depending upon current issues and interests. (F,SP)

292. Seminars for M.P.H. Students. (1-4) May be repeated for credit. One 1 to 4-hour seminar per week. Current topics and special issues in the health field. (F,SP)

293. Dr.P.H. Seminar. (1-4) May be repeated for credit. One 1 to 4-hour seminar per week. Discussion and analysis of dissertation research projects, as well as of conceptual and methodological problems in planning and implementing research. (F,SP)

294. Post-Residency Seminar. (2-3) One 2-3 hour seminar per week. Prerequisites: Residency in administration, planning, or policy. Comparative analysis of field residency experiences as related to academic work, theoretical and practical issues in public health, and personal development. (F,SP)

295. Seminars. (1-4) May be repeated for credit. One 1 to 4-hour seminar per week. Prerequisites: Graduate standing. (F,SP)

296. Special Study. (1-10) May be repeated for credit. Independent study. Prerequisites: Graduate standing. Designed to permit any qualified graduate student to pursue special study in a direction of the student's own choosing. (F,SP)

297. Field Study in Public Health. (1-12) May be repeated for credit. Field study. Prerequisites: Graduate standing. Supervised experience relevant to specific aspects of public health in off-campus organizations for graduate students. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

297G. Field Study in Public Health: Health Education. (1-12) May be repeated for credit. Field study. Prerequisites: Graduate standing. Supervised experience relevant to specific aspects of public health in off-campus organizations for graduate students. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

298. Group Study. (1-8) May be repeated for credit. Independent study. Prerequisites: Graduate standing. (F,SP)

299. Individual Research. (1-12) May be repeated for credit. Independent study. Prerequisites: Graduate standing. (F,SP)

601. Individual Study for Master's Students. (1-8) Units may not be used to meet either unit or residence requirement for a master's degree. May be repeated for credit. Independent study. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Individual study for comprehensive or language requirement. (F,SP)

602. Individual Study for Doctoral Students. (1-12) May not be used to meet unit or residence requirements for the doctoral degree. May be repeated for credit. Independent study. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (and other doctoral degrees). (F,SP)

520. International Food and Nutrition Policies. (3) Sponsoring departments: Nutritional Sciences, Agricultural and Resource Economics, Social and Administrative Sciences. Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. Interdisciplinary course surveying the world food situation emphasizing the links between food production, food consumption and nutrition; the effect of income and prices on food demand, and socio-economic factors affecting food consumption within and among households. The various nutritional problems facing developing countries (including famine); intervention measures, such as food aid, feeding programs, price policies and nutrition education, and methods of program evaluation are reviewed. (SP)

Social Sciences (College of Letters and Science)

Field Major Office: Division of Undergraduate and Interdisciplinary Studies, 301 Campbell Hall, 642-0108

Professor: Donald A. McGuire, Ph.D. (Dean)

Lecturers: Gerald J. Cavanaugh, Ph.D; Robert Enrich, Ph.D; Earl Klee, Ph.D; Kathleen Moran, Ph.D; Gary P. Wren, Ph.D

Field Major in Social Sciences:

The Major Program

The field major in social sciences is especially designed for students who are interested in a liberal arts education in the social sciences. The major combines breadth—courses drawn from a number of disciplines—with an individual area of concentration tailored to the needs of each student. Students are responsible for developing their own program of studies with the advice and approval of a faculty member of the staff who will act as their official adviser.

The field major is administered by a faculty advisory committee and is one of the programs of the Division of Undergraduate and Interdisciplinary Studies.

Admission to the Major. Students will be considered for the social sciences field major by completion of application. The social sciences faculty will review applicants on the basis of the appropriateness of their proposed area of concentration, the quality of their previous course work in relevant courses, and their overall potential for interdisciplinary work. Candidates for the major should discuss their individual proposals with a member of the faculty before submitting an application. Applications will be accepted twice each semester. Contact the department office in 301 Campbell Hall for specific procedures and deadlines.

Lower Division Requirements. One year of World Civilization (Freshman and Sophomore Studies 44 or equivalent). The list of courses that can be used to fulfill the requirement is available in the Division of Undergraduate and Interdisciplinary Studies Office. The World Civilization requirement must be taken for a letter grade.

Area of Concentration. As part of the application for admission to the program, each student must define an individual area of concentration, providing a focus for academic work in the major. The upper division courses chosen from the fields listed below must relate coherently to one another and contribute to an interdisciplinary examination of the issues inherent in the area of concentration.

Upper Division Requirements. 30 units distributed among the following:

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workplace, schools, colleges, and youth culture; the shifting educational responsibilities of family, church, philosophy, political science, psychology, religious studies, rhetoric, social welfare, sociology, women's studies. Courses from other disciplines are also accepted when appropriate.

2. Social Sciences 103A-103B. Theory, Methods, and Applications of the Social Sciences. Core courses for juniors.

3. Social Sciences 190, Senior Thesis. The presentation and preparation of a senior thesis pertaining to the student's area of concentration.

Honors Program. Upper division students with 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. H195 will be substituted for Social Sciences 190. Honors candidates must submit a detailed research proposal with a preliminary bibliography to the prospective thesis supervisor. They must also obtain the prior agreement of a faculty member (in addition to the supervisor) 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

10. Topics in the Social Sciences. (4) Course may be repeated for credit. Three hours of lecture and discussion per week. This course will explore theories and methodological debates about the development and impact of technology on American society since WW II. We will focus on such technologies as the automobile, television, telecommunications, computers, and medical technologies, paying particular attention to the way technology is represented in popular culture and the way culture constructs and frames the possibilities of technological change. (F) Moran, Wren

39. Social Sciences Seminar. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Completion of Subject A or consent of instructor. This lower division seminar will concentrate on close analysis, discussion, and interpretation of "classic" works in the social sciences, and will introduce students to those works whose intellectual capital we are still relying on in making sense of our contemporary world.

Upper Division Courses

*101. Problems in the Social Sciences. (3) May be repeated for credit if topic changes. Two 1 1/2-hour lectures per week. Prerequisites: Completion of 103A-103B; at least 9 upper division units in history and other social sciences. Application of the methods of the Social Sciences to a problem in history, the other social sciences, or an immediately related area.

103A. Theories, Methods, and Applications of the Social Sciences. (3) Two 1 1/2-hour lectures per week. Prerequisites: General education, professional education, or consent of instructor. Applications of methodological principles and key concepts of the social sciences. (F,SP) Cavanaugh, Ethington, Kleh, Moran

103B. Theories, Methods, and Applications of the Social Sciences. (3) Course may be repeated for credit as topic changes. Two 1 1/2-hour lectures per week. The application of methodological principles and key concepts of the social sciences to specific problems in contemporary society. (F,SP) Cavanaugh, Ethington, Kleh, Moran

*150. Education and American Society. (3) Two 1 1/2-hour seminars per week. Prerequisites: Upper division standing or consent of instructor. Examination of educational institutions in America. Emphasis upon the shifting educational responsibilities of family, church, workplace, schools, colleges, and youth culture; the demographic, economic, political, and cultural forces explaining the rise of public schooling; present-day issues and changes to school governance. (also listed as Education 156 and IDS 156.) Clifford

179. Undergraduate Colloquium. (1) Course may be repeated as topic changes. One 1 1/2-hour lecture per week. Must be taken on a passed/not passed basis. Topics change each semester. Students may check with the department office, 301 Campbell Hall, for the current topic. (F,SP) Staff

190. Senior Thesis. (4,SP) Individual conferences. Prerequisites: Senior standing; completion of 103A-103B; at least 9 upper division units in history and other social sciences. The preparation and presentation of a senior thesis pertaining to the student's individual area of concentration within the Social Science Field Major. (F,SP) Staff

H195. Honors Thesis. (4) Individual conferences. Prerequisites: Senior in the honors program; completion of 103A-103B; at least 9 upper division units in history and other social sciences. Entails writing a bachelor's thesis pertaining to the student's individual area of concentration within the Social Science Field Major. The completed thesis will be read by the thesis supervisor and one other faculty member. (F,SP) Moran

*197. Internship Program. (3) One 3-hour seminar and 10 to 12 hours of internship per week. Prerequisites: Completion of Subject A or consent of instructor. May be taken on a passed/not passed basis. Analysis of contemporary social and political organizations. Changing topics (depending on the nature of field placements) include the politics of urban planning and development, the structure of contemporary communication media, women in political life, poverty and the social welfare system, consumer advocacy and the legal system. Assignments include weekly readings and issue papers, field research papers, and a journal. (F,SP) Staff

198. Directed Group Study for Upper Division Students. (1-3) Course may be repeated for credit. Conferences. Must be taken on a passed/not passed basis. Directed group study on special topics approved by the Division. (F,SP) Staff

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. Directed individual study on special topics approved by the Division. (F,SP) Staff

Social Welfare

(School of Social Welfare)

School of Social Welfare Office: 120 Haviland Hall, 642-4341 Dean: Harry Spechtt, Ph.D.

Professors: Eileen Gambrel, Ph.D. University of Michigan. Child welfare, mental health
Neil Gilbert, Ph.D. University of Pittsburgh. Social policy and planning
Henry Miller, D.S.W. Columbia University. Research, mental health
Leonard S. Miller, Ph.D. University of California at Berkeley. Economics and social service
Robert Pruger, D.S.W. University of California at Berkeley. Social policy and administration
William McKinnny Rhyner, University of California, Adult development
Steven P. Segal, Ph.D. Wisconsin University, Mental health
Ronnie L. Snowden, Jr., Ph.D. Wayne State University. Social agency management
Harry Spechtt, Ph.D. Brandeis University. Social planning, professional education
Ernest Greenwood, Ph.D. (Emeritus)
Ralph M. Kramer, D.S.W. (Emeritus)
James R. W. Muskat, D.S.W. (Emeritus)
Maurine McCorry, Ph.D. (Emerita)
Margaret S. Schubert, Ph.D. (Emeritus)
Kerrin T. Wilson, D.S.W. (Emeritus)

Associate Professors: Richard P. Barth, D.S.W. University of California at Berkeley. Child welfare, family violence
Jewelle Taylor Gaskin, Ph.D. University of California at Berkeley. Adolescent psychopathology, minority mental health
Andrew E. Scharfch, Ph.D. Stanford University. Gerontology.

Assistant Professors: Mary Ann Mason, J.D. University of San Francisco, Ph.D. University of Rochester. Law and social policy
Lorraine Midianik, Ph.D. John Hopkins University. Health services, substance abuse
Kurt C. Organista, Ph.D. Arizona State University. Multivitamins psychosocial adaptation, psychopathology
Yu Ying, Ph.D. University of California at Berkeley. Psychotherapy

Academic Administrator/Lecturer: Paul W. D., D.S.W. University of California at Berkeley. Social policy

Senior Lecturers: William Smelser, Ph.D. University of California at Berkeley. Gerontology and development, psychopathology
P Justin Welterari, Ph.D. University of Lund, Sweden. Divorce and marital health

Lecturers: Donald Cohon, Ph.D. University of Southern California. Clinical psychology, immigration and refugees.
C. Angela Browne Miller, D.S.W. University of California at Berkeley. Employee Services policy and practice
Joseph Miller, Ph.D. University of California at Berkeley. Social agency management and planning
Trispora Pestle, D.S.W. University of California at Berkeley. Family therapy
Warran Schonfeld, Ph.D. University of North Carolina. Research and statistics

Coordinator of Field Work/Associate Adjunct Professor: Bart R. Reisman, Ph.D. University of Michigan. Field education

Field Work Consultants/Lecturers: Anne-Theeresa Agosta, M.S.W.
Doris Britt, M.S.W.
Bari Cornet, M.S.W., M.P.H.
Joan Daniels, M.S.W.
Gwendolyn Foster, M.S.W.
Rafael Herrera, M.S.W.
Peter Mandeloff, M.S.W.
Barrie K. Robinson, M.S.W.
Joseph Solls, M.S.W.

Undergraduate Group Major Adviser: Mr. Terrell.

Undergraduate Program, College of Letters and Science

The Department of Social Welfare administers an undergraduate group major in social welfare in the College of Letters and Science. The group major, leading to the degree of Bachelor of Arts, offers a sequence of social welfare courses and social science electives of general interest to liberal arts students. It provides students with an opportunity to test their interest in social work prior to employment or graduate professional education. Applicants to the major will be considered throughout the year. It is recommended that the prerequisites be satisfied, but students may declare the major before they have taken all the prerequisites.

Major Requirements

Lower Division. Psychology 1, Sociology 1 or 3, and Statistics 2 or equivalent. Recommended: Anthropology 3, Economics 1, Political Science 1.

Upper Division. A minimum of 29 upper division units, including Social Welfare 100B, 102, 103, and 104 (elective), and 105, a minimum of five courses chosen from the list of restricted social science electives—three of the courses taken in one department and two selected from other departments. For a list of courses, contact the Social Welfare Undergraduate Office, 117 Haviland Hall.

Honors Program. Eligible social welfare majors, upon recommendation of their advisers, may enroll in an honors seminar (Social Welfare H195) to prepare a senior thesis. Prerequisites: Social Welfare 100B, 101, 102. The senior thesis will be of a creative and integrative character, the product of a research project of special interest to the student. A faculty committee will approve it for breadth, depth, and feasibility. For admission to the Honors Program, an overall grade-point average of 3.3 and a grade-point average of 3.3 overall in the major are required.
Graduate Program

For program description, see page 89.

Lower Division Courses

20. Social Problems and Social Welfare: A View Through Literature. (2) One 2-hour lecture per week. A vision of the consequences of industrialization as seen through the eyes of creative writers and journalists. Among the topics to be covered are: Poverty, Crime and Delinquency, Dependency, and Mental Illness. (F) H. Miller

98. Group Study in Social Welfare. (1-3) Course may be repeated for credit. Must be taken on a passed/not passed basis. Group study on selected social welfare topics. Open to freshmen and sophomores. (F,SP) Staff

Upper Division Courses

100. Social Welfare Policy. (3) One 2-hour lecture and one 1-hour discussion per week. Analysis of social welfare policies and programs including public assistance, social insurance, social services, and health and mental health. (SP) Terrrell

102. Social Work As a Profession. (2) One 1-hour lecture and one 1-hour discussion section per week. This course examines social work as a profession: What social workers do (the practice of the profession); where they do it (the organizational context of professional practice); and the rules of conduct they follow (the ethics of the profession). (F) Pruger

103. Practice in Social Work. (3) One 2-hour lecture and one 1-hour laboratory/discussion per week. Prerequisites: 102. An introduction to the basic skills of interpersonal helping and problem solving and to related theory and research. (F) Ageson

104. Field Study in Social Welfare. (4) Fifteen days in fieldwork plus one 2-hour seminar per week. Must be taken on a passed/not passed basis. Prerequisites: 100, 102. Supervised field work in social agencies plus university-based integrative seminars. Open only to social welfare majors. (SP) Manolesos

105. Current Topics in Social Welfare. (2) One two-hour lecture per week. Prerequisites: 100; 102; 103. This course will examine current problems and issues in the field of social welfare. Topics will vary annually. Issues will be selected employing a consistent format to insure coherence and consistency. Format elements include the analysis of problem demographics and etiology, intervention alternatives, policy making, and policy implementation at the levels of local, state and federal governments, families and the private sector. (SP) Staff

H195. Senior Honors Course. (1-3) Course may be repeated for credit. Individual consultation. Prerequisites: 100. Preparation of an honors thesis. (F,SP) Staff

197. Field Studies in Social Welfare. (1-3) Field work in community agencies and individual conferences with faculty. Must be taken on a passed/not passed basis. Supervised experience relevant to specific aspects of social welfare in various organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP) Staff

198. Group Study for Advanced Undergraduates. (1-3) 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) May be repeated for credit. Tutorial conference. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations specified in the General Catalog. (F,SP) Staff

Graduate Courses

200. Human Development in the Social Environment. (2) One 2-hour 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) One 2-hour lecture per week. Developmental abnormalities that result in dys-functional 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) One 2-hour lecture per week. Prerequisites: 200. Descriptions, measurements, and theoretical implications of the etiology of stress and coping in the adult (25-60) years. (SP) Smeisle

210B. Infant Development. (2) One 2-hour lecture per week. Prerequisites: 200. Topics and issues in infant development, including infant mental health, parent-child relationships, behavior assessment, behavior problems, and types of disturbance, and intervention with high risk infants. (F) Staff

210C. Aging Processes. (2) One 2-hour lecture per week. Prerequisites: 200. Sociological, psychological, and physiological variables relevant to the assessment of older persons. (SP) Scharfman

210D. Life Histories and Case Studies. (2) One 2-hour lecture per week. Prerequisites: 200. Theoretical and methodological problems in the study of individual lives. Focus on the intellectual and social processes that shape the life course, including the development of personal characteristics, formation of social roles, and changes in the aging process. (F) Runyan

210E. Human Development and Social Policy. (2) One 2-hour lecture per week. Prerequisites: 200. Selected topics in human development and their relevance for social planning and administration. Attention to topics such as cognitive-social development and educational policy, maternal deprivation and day care, burn-out, displaced homemakers, and issues in aging. (SP) Runyan

210F. Social Networks and Social Support. (2) One 2-hour 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. (SP) Snowden

210H. Personality Theory. (2) One 2-hour lecture/discussion per week. Prerequisites: 200. Analysis of several major approaches to personality theory, including psychoanalytic and neo-analytic, behavioral, humanistic, and culture and personality theories, with attention to relations between the life and work of Freud, Skinner, Rogers, Maslow, Murray, and Margaret Mead. A general overview of the concepts and techniques of research: its sources, its relations to practical affairs, its intellectual merits and deficiencies, and finally, its reception by the wider culture. (SP) Runyan

220. Introduction to Social Welfare Policy. (2) One 2-hour lecture per week. Analysis of issues in social welfare policy and recent trends shaping the development of the American welfare state. (F) Gilbert, Pruger

221. Mental Health and Social Policy. (2) One 2-hour lecture per week. Mental health policies and programs; the roles of the state, local, and federal governments, families and the private sector. (SP) Segal

222. Mental Health Problems. (2) One 2-hour lecture per week. How mental health problems are conceptualized and the decisions to such problems are determined; new directions in the roles of community mental health social workers. (F,SP) Staff

223. Designing Solutions to Mental Health Problems. (2) One 2-hour lecture per week. How mental health problems are conceptualized and the decisions to such problems are determined; new directions in the roles of community mental health social workers. (F,SP) Staff

226. Social Policy and Gerontology. (2) One 2-hour lecture per week. U.S. social policy and program development. Special emphasis on aging assets to the knowledge required to assess the needs for societal supports and major issues and trends in the delivery of social services. (SP) Robinson

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall

227. Advanced Study in Aging Policy. (2) One 2-hour lecture per week. Advanced study in special program and policy areas. Staff

230. Social Policy: Children and Families. (2) One 2-hour lecture per week. Legal information and policy discussion for social workers and other human service providers in the field of aging. Staff

234A. Social Welfare in the Workplace. (2) One 2-hour lecture per week. Course reviews characteristics and controversies of and controversies in modern employee services. Examines employer-sponsored programs in mental health, substance abuse, family counseling, and day care. Analysis of benefit plan design. Staff

238B. Drug and Alcohol Policy. (2) One 2-hour lecture per week. Course reviews substance abuse policy is formulated by examining political, historical, epidemiological and clinical factors. Emphasis on how alcohol and drug problems become defined as social problems and how definitions influence subsequent treatment/intervention strategies. Focus on alcohol abuse and on individual and social control models of substance abuse. In addition, the development and evaluation of alcohol and drug abuse treatment will be discussed. (SP) Mikanik

239. Health Policy—A Social Welfare Perspective. (2) One 2-hour lecture per week. Reviews major issues and programs in 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 policy and programs for society and the individual client. (SP) Midanik

239D. Women's Issues. (2) One 2-hour lecture per week. The changing roles of women in society and their impact. Topics include socio-economic status, sex role socialization, fertility control, and community resources. Social policies in health, mental health, social security, day care, and public assistance will be explored using an analytic framework to investigate impacts on women. (F) Mason

239E. Social Policies Affecting Indian Children, Families, and Communities. (2) One 2-hour lecture per week. Overview of major social policies and their impact on Native Americans. Examines special relationship of Indian tribes and the federal government and its consequences for human services formulation and delivery. Special emphasis on the formation of Indian health care and its impact on physical and mental health, social security, day care, and public assistance. (SP) Segal

240. Introduction to Social Welfare and the Profession. (2) One 2-hour lecture per week. Examines the history, development, and mission of the field of social work and professional social work task, and the organizational contexts of practice. (F) Specht

*On leave, spring
*Recalled to active service
*Recipient of Distinguished Teaching Award
242. Introduction to Direct Social Work Practice. (2) One 2-hour lecture per week. This course provides students with an overview of direct social work methods and the intervention process, especially the initial stages of engagement, assessment, and planning. Emphasis is placed on approaches for working with disadvantaged clients, especially lower-income and minority populations, focusing on: rapport building, gathering information, understanding the client's perspective, and problem solving. (SP) Staff

243. Direct Practice in Child and Family Settings. (2) One 2-hour lecture/discussion per week. Prerequisites: 242. Course will examine the dynamics of family systems, including the behavioral, emotional, and situational problems of children and families in child welfare, mental health, medical, school, and community settings. (SP) Age, Staff

244. Direct Practice in Mental Health Settings. (2) One 2-hour lecture/discussion per week. Prerequisites: 242. 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) Maneoles

245. Direct Practice in Health Settings. (2) One 2-hour lecture/discussion per week. Prerequisites: 242. Examines the range of therapeutic modalities used by social workers in health care, the interaction of health care policy and practice, interdisciplinary issues, and the ethical dimensions of practice. (SP) Dunkel

246. Direct Practice in Aging Settings. (2) One 2-hour lecture/discussion per week. Prerequisites: 242. Comprehensive assessment of the elderly, normal and abnormal; dimensions of the aging process; and the range of direct intervention models for working with the elderly. (SP) Scharlach

250A. Social Work with Groups. (3) One 2-hour lecture per week. Prerequisites: 242. Theory and practice regarding the formation, sustenance, and termination of groups. Emphasis on the role of the social worker in facilitating inter-personal processes in groups. (F) Grossman

250B. Family Therapy. (2) One 2-hour lecture per week. Prerequisites: 242. Theoretical frameworks and intervention skills for family work. (F,SP) Peskin, Staff

250C. Brief Therapy and Crisis Intervention. (2) One 2-hour lecture per week. Prerequisites: 242. Examines the clinical application of crisis intervention and brief psychotherapy from an historic and psychodynamic perspective. Provides assessment criteria for assignment to these forms of treatment and techniques for intervention. (SP) Smeltzer

250D. Psychotherapeutic Methods with Adults. (2) One 2-hour lecture per week. Prerequisites: 242. Treatment planning and applications for clinicians. Examines supportive treatment, depression and suicide management and treatment, brief and long range expressive psychotherapy and other intervention models. (F) Staff

250F. Social Work In Health Care. (2) One 2-hour lecture per week. Prerequisites: 242. Theoretical bases and justifications of social work in health settings. Examines interplay of psychodynamic, environmental, and medical factors. Staff

250G. Child and Family Violence. (1) 15 hours of seminar per semester. Prerequisites: 242. Course addresses the delivery of services to children and women who are victims of family violence. Practice issues addressed include: handling reports of abuse; verifying allegations or suspicions of abuse; decision making about pursuing reunification or independent placement; and providing services to the victim and the victim's family. Staff

250H. Health and Aging. (2) One 2-hour lecture/discussion per week. Prerequisites: 242. Course addresses social work interventions with the frail elderly and their families. Emphasis given to the biopsychosocial model of assessment and treatment and the impact of the healthcare system on the elderly. Staff

250I. Intervention with Adult Families. (2) One 2-hour seminar per week. Prerequisites: 242. Course will examine the dynamics of families from the post-parental phase through the aging and death of the parents. These issues will be analyzed in relation to their implications for service delivery strategies which support the continued growth of both the family as a network and of its individual adult members. Emphasis will be on preventive interventions which will prepare the family to cope with complex issues that affect the family and parent become dependent in later life. Scharlach

250K. Social Work Practice with Sexual Problems. (1) One 2-hour lecture per week for 7 1/4 weeks. Prerequisites: 242. Skills applicable to sex-related concerns encountered in social work practice. Presents theories of the etiology of sexual problems; explores treatment modalities. Staff

250L. Child Welfare Practice. (2) One 2-hour lecture per week. Prerequisites: 242. Examines practice roles in child welfare settings using permanency planning as a guiding framework. Staff

250M. Curriculum and Career Counseling in Schools. (1) Fifteen hours of seminar per semester. Prerequisites: 242. Examines practice roles and assessment criteria for working with children in school settings. Emphasis will be on preventive interventions which will prepare the family to cope with complex issues that affect the family and parent become dependent in later life. Scharlach

250N. Social Work with Chronically Mentally Ill Adults. (2) One 2-hour seminar per week. Prerequisites: 242. Emphasizes the process of social work practice. Staff

250O. Direct Treatment of Children. (2) One 2-hour lecture per week. Prerequisites: 242. Examines the psychotherapeutic interactions between therapist, child, and family. Topics form the basic knowledge and repertoire of skills for clinicians working with children. (F) Staff

250P. Social Work with Adolescents. (2) One 2-hour lecture/discussion per week. Prerequisites: 242. This course will focus on the methods for the assessment and treatment of disturbed and delinquent adolescents. Psychodynamic, socio-cultural and ecological perspectives on adolescence will be examined. A variety of early intervention and treatment modalities will be explored. (SP) Gibbons

250S. School Social Work. (2) One 2-hour lecture/discussion per week. Prerequisites: 242. Course addresses the compliance requirements for the California Pupil Personnel credential. Examines the organizational context of school social work; practice competencies; the role of the P.P.B. credential in school social work. Focus on: professional roles and responsibilities; understanding student needs; and the bulk of the course will be devoted to the disease model and the concept of prevention. Emphasis will be given to prevention and epidemiology. Staff

251. Introduction to Management and Planning. (2) One 2-hour lecture per week. Course introduces concepts and techniques for establishing and maintaining healthy, productive, and successful social service agencies. (SP) Staff

252. Social Agency Management. (2) One 2-hour lecture per week. Basic theories, concepts and techniques for the administration of human services. Topics include program development and implementation, relations with community groups, staff development, supervision, training and finance. (SP) Staff

254A. Program Development and Proposal Writing. (2) One 2-hour lecture per week. Plans and techniques of program design and proposal writing. (F) Staff

254B. Efficiency in Social Welfare Administration. (2) One 2-hour lecture per week. Theories of organizational behavior and the practice of administration. Special problems of power, conflict, and change in human service organizations. (SP) Staff

254C. The Good Bureaucrat. (2) One 2-hour lecture per week. An analysis of the problems and opportunities faced by service providers in bureaucracies. Examines the question: "How can the professional manage the bureaucratic environment of service delivery so as to maximize rather than be managed by it?" (F) Pruger

254E. Boards, Legislators, and Volunteers. (2) One 2-hour lecture per week. Study of the structure, function, and dynamics of task groups; various concepts of leadership; board-executive and professional-volunteer relationships, techniques and skills for conducting meetings, conferences, and workshops. (F) Staff

254F. School Welfare Planning. (3) One 2-hour lecture per week. Philosophical and ethical issues of the planning process, program analysis, designing and assessing alternatives, performance assessment and evaluation. Consideration of the politics of planning and policy analysis. (SP) Staff

254A. Community Planning. (2) One 2-hour lecture per week. Theories and techniques of planning as an organizational, socio-political, and technical process. Examines roles, tasks, and value choices. Compares alternative systems of planning. Staff

270. Access to Human Services Among Low Income and Minority Populations. (2) One 2-hour seminar per week. Course examines the impact of race and ethnicity on access to social services. Special problems faced by minority groups and intervention techniques are presented. (F) Snowden

272. Conceptualizing Mental Health Interventions/Ethnic Minority Populations. (2) One 2-hour seminar per week. The role of cultural, social, and economic factors affecting mental health and mental illness as culture-bound conceptualizations and demonstrates culture-specific biases of western views and interventions. Explores mental health needs of U.S. minority groups and intervention techniques. Staff

274. Immigrants and Refugees: Policy Issues and Clinical Concerns. (2) One 2-hour seminar per week. Overview of immigration policy in the United States from an international and historical perspective and of
psychosocial theories of migration. Theories of acculturation, assimilation, and adaptation will be illustrated and applied to the analysis of individual cases. Course material also reviews clinical cases with discussion of relevant treatment models and issues in vising cross-cultural intervention strategies. (SP Staff)

276. Social Work Practice with Minority Families and Children. (2) One 2-hour seminar per week. Course focuses on the assessment and treatment of Asians, Blacks, Hispanics and American Indians. While the major emphasis is on clinical treatment of families, the course also addresses issues of the child welfare, health care and juvenile justice systems. Issues of access and utilization will also be explored. (F) Organizational Gibb

278. Seminar in the History and Philosophy of Social Welfare. (2) One 2-hour seminar per week. Primarily for doctoral students. A review of efforts to conceptualize the field of social welfare and to analyze its tendencies. (SP Staff)

280. Introduction to Social Welfare Research. (2) One 1-hour lecture and one 1-hour 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) One 2-hour seminar per week. Prerequisite: 280. Problem formulation, design, and implementation. (F,SP Staff)

287. Introduction to Library Resources and Faculty Research (2) One 2-hour seminar per week. Must be taken on a pass/failed basis. Students will be introduced to the tasks and tools of library research in social welfare, including reference works, bibliographic aids, and database bases. Individual faculty members will present their research, emphasizing methodology, outcomes and contribution to social welfare. (F,SP Staff)

288. Report Writing and Editing. (1) One 1-hour seminar per week and individual consultation. Must be taken on a pass/failed basis. Seminar is primarily for doctoral students. Supervised practical experience in planning, critizing, and editing reports, articles, or student papers. Attention to formal organization, style, selection of media for publication, and preparation of manuscripts. (Staff)

289A. Research Methods and Techniques in Social Welfare. (2) One 2-hour lecture per week. The logic of social research: topics include rationale and procedure of research design, validity, reliability, and an introduction to sampling. (F) M. Idenik

289C. Introduction to Regression. (2) One 2-hour lecture per week. Prerequisites: 289A. Course addresses generalized linear stochastic specification; the reason why ordinary least squares estimates are desirable — the Gauss-Markov theorem; sampling distribution, testing, and the goodness of fit of OLS estimates; detection and treatment of problems associated with regression analysis such as specification error, measurement error and multi-collinearity. (F) Staff

290. Estimating Models with Qualitative and Limited Dependent Variables. (3) One 3-hour lecture discussion/weekly computer laboratory. Prerequisite: 289A. Objective is to understand and estimating stochastic models of events measured by limited dependent variables. Understanding includes: examples in the literature illustrating methods covered in the course; translating the ideas described by limited measures into stochastic models of these events; and knowing statistical theory underpinning estimation. Estimate means being able to use the computer program called LIMDEP. (SP, L. Miller)'

290B. Community Organizing. (2) One 2-hour lecture per week, one 2-hour laboratory per week. One 2-hour seminar per week. Prerequisite: 240. Introduction to the theory and practice of community organization. (SP Staff)

296. Individual Study for Graduate Students. (1-12) One 1-hour seminar per week. Must be taken on a pass/failed basis. Seminar is primarily intended to permit qualified graduate students to pursue special study interests in a subject area of their choosing under the direction of a faculty member. (F,SP Staff)

298. Group Study for Graduate Students. (1-12) Course may be repeated for credit. One unit will be awarded for each 4 hours per week of student work. Seminar discussion. Prerequisites: Consent of instructor. Intensive examination of selected social welfare topics. (F,SP Staff)

299. Individual Research for Graduate Students. (1-12) Course may be repeated for credit. One unit will be awarded for each 4 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,SP Staff)

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit up to a limit of 16 units. May not be used for unit or residence requirements for the doctoral degree. One unit will be awarded for each 4 hours per week of student work. Must be taken on a pass/failed 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. (F,SP Staff)

Professional Courses

301. Training in Teaching. (1-6) Course may be repeated for credit. Supervised teaching assistance. Must be taken on a pass/failed basis. One unit will be awarded for each 4 hours per week of student work. (F,SP Staff)

400. Introductory Practicum. (1) One 2-hour seminar per week. Must be taken on a pass/failed 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,SP Staff)

401. Field Practicum. (1-10) Course may be repeated for credit. One unit of credit awarded for each 4 hours per week of practicum work. Must be taken on a pass/failed basis. Supervised field work in social agencies and university-based group meetings. (F,SP Staff)

403. Training in Research. (1-6) Course may be repeated for credit. One unit of credit awarded for each 4 hours per week of student work. (F,SP Staff)

Interdepartmental Studies Courses

Upper Division Courses

*IDS 114A-114B. Advances in Aging: Alzheimer's Disease: Biological and Social Dimensions. (2,2) One 2-hour lecture per week in the evening. Prerequisites: High school biology and chemistry. This interdisciplinary course will single out specific topics in aging of great current interest (tai, Alzheimer's disease; spore and cognitive intervention) and present lectures on all aspects of each topic (biomedical, health, socio-economic, legal and ethical). Invited speakers with special expertise in these areas will participate. Social work departments: Optimetry, Social Welfare, Public Health, and Molecular and Cell Biology.

*IDS 119. Multidisciplinary Studies and Field Experience in Aging. (2) Sponsoring departments: Optometry, Social Welfare Public Health, and Molecular and Cell Biology. (2) One 2-hour lecture per week in the evening. Prerequisites: Upper division or graduate student and consent of instructor. Study of adults 70 years and over. Students will work with older patients from local geriatric clinics and confer with clinic staff. One weekly seminar consists of lecture by faculty on aging from specific discipline. Other hour is devoted to case presentation by student on a patient's condition. Course grade based on student participation and final paper demonstrating understanding of interdisciplinary nature of aging and caring for older people.

Graduate Courses

*IDS 232A-232B. Understanding Families: Methods In Family Research. (1,1) Two hour seminar every other week. Prerequisites: Consent of instructor. This seminar will focus on the relation between theory and method in understanding family structure and function. It will examine historical, cultural, and psychological perspectives on studying couples, parent-child relations, family systems as they change over time. Attention is given to processes within the family and to the connections between the family and other social institutions. Methods for understanding the role of the family in both normal and dysfunctional development will be evaluated.

Related Courses in the Program in Public and Nonprofit Management

IDS 205. Advanced Seminar in Public and Nonprofit Management. (3)

IDS 208. Techniques of Management Control. (3)

IDS 209. Applied Microeconomics. (3)

IDS 210. Organizational Understanding for Managers. (3)

IDS 211. Public Sector Accounting. (3)

IDS 212. Financial Management. (3)

IDS 214. Strategic Management in the Public Sector. (3)

IDS 217. Technology, Tasks, and Politics. (3)

IDS 218. Information Resource Management. (3)

IDS 219. Financing Tools for Public Managers. (3)

IDS 220. Management Professionals in Organizations. (3)

For information about these and other courses related to this program, see the Public and Nonprofit Management section of this catalog.

Sociology

(Graduate Program in Social Science)

Department Office: 410 Barrows Hall, 624-4766
Chair: Michael Hout, Ph.D.

University Professor: Neil J. Smelser, Ph.D. Harvard University. Theory, economics, social change

Professors:
Robert N. Bellah, Ph.D. (Eliot Chair) Harvard University. Theory, religion, Japanese society
Robert Blauner, Ph.D. University of California at Berkeley. Race, gender, work, age
Michael Burawoy, Ph.D. University of Chicago. Labor, comparative, political economy
Nancy J. Chodorow, Ph.D. Brandeis University. Feminist theory, family, psychoanalysis
Robert E. Cole, Ph.D. University of Illinois. Organizations, work, Japanese society
Troy Duster, Ph.D. Northwestern University. Deviance, networks, technology
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, history, technology
Todd A. Gitlin, Ph.D. University of California at Berkeley. Media, culture, social movements
Leo A. Goodman, Ph.D., D.S.O. (Hon.), (Class of 1938 Professorial Chair) Princeton University. Social sciences, statistical methodology
Alene H. Hochschild, Ph.D. University of California at Berkeley. Family, gender, work
Michael Hout, Ph.D. Indiana University. Demography, organizations, stratification
William Kornhauser, Ph.D. University of Chicago. Political sociology, social movements
Kristin Luker, Ph.D. Yale University. Gender, population, medicine
David L. Matza, Ph.D. Princeton University. Theory, social psychology
H. Franz Schurmann, Ph.D. Harvard University. Organizations, cities, China, America

*Recall to active service
*Recipient of Distinguished Teaching Award
3. Three additional courses which must be upper division sociology courses numbered 102A-190, or 295, 296, 301, 401, 601, or 602 may be counted toward the eight-course requirement. No undergraduate sociology courses may count toward the upper division eight-course requirement. At least two courses in the Sociology 280 series. Before the qualifying examination, the student must have successfully completed Sociology 299, one of which is a theory course in the 272 or 273 series and one of which is a methods course in the 272 or 273 series. (All three courses must be taken for a letter grade and both the theory and methods courses must be counted toward a grade of B or better) Competence in methodology must also be documented by prepa-ration of an acceptable research paper. The depart-ment members of the student’s qualifying examination committee will determine the acceptability of the paper.

A foreign language may be required by the stu-
dent’s qualifying examination committee if deemed necessary for the dissertation research. Before formal advancement to candidacy for the Ph.D., the student must have written and received approval by the proposed committee of a dissertation prospectus.

Within a period of no more than six years from the date of admission, students are expected to complete and file their dissertation. Under special cir-
cumstances, the department may recommend to the Graduate Division an extension of candidacy if the extension has been approved by the dissertation committee chair and the graduate advisor.

Lower Division Courses

1. Introduction to Sociology. (4) Not open to stu-
dents who have taken 3. Two hours of lecture and two hours discussion per week. Introduces students who are considering majors in sociology to the basic top-
ics, concepts, and methods of the discipline. This course is required for the major; 1 or 3 is prerequisite for other sociology classes; students not considering a sociology major are directed to 3. (F,SP)

2. Principles of Sociology. (4) Not open to students who have taken 1. Three hours of lecture per week. An introduction to the fundamental problems of human life—social organiza-
tion, culture, interaction processes and socialization— and the dynamics of modern society. Satisfies pre-
requisite; must fulfill the methods requirement. Most students enrolling for the first time are advised to take both Sociology 105 and 106. (F,SP)

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requisite; must fulfill the methods requirement. Most students enrolling for the first time are advised to take both Sociology 105 and 106. (F,SP)

4. Applications are considered once a year for fall semester admission only. Candidates for admis-
sion must apply by February 1, except for those applying for a fellowship; that deadline is January 5. Applications and supporting materials are available from the graduate assistant in the Sociology De-
partment, 410 Barrows Hall. Applicants must take the Aptitude Test of the Graduate Record Exam-
ination, (required for those applying in October). The undergraduate major need not have been in sociology. The char-
acter and quality of the applicant’s prior education and experience are more important than the actual field of study.

M.A. Degree Requirements. Eight courses taken for a letter grade are required, as follows: the student must pass Sociology 201 (Theory) and must fulfill the methods requirement. Most students fulfill the methods requirement by passing Soci-
ology 271A and 271B with a grade of B or better, and by submitting a satisfactory methods paper. (More details are available from the department’s graduate assistant.) At least two courses in the Sociology 280 series. A maximum of three courses may be taken as 205s in counting toward the eight courses. And a maximum of two courses of work taken in Sociol-
ogy 299 and in upper division and graduate courses of other departments may be counted to-
ward the eight course minimum. No undergraduate sociology courses may count toward the eight courses. Before the qualifying examination, the student must have successfully completed Sociology 299, one of which is a theory course in the 272 or 273 series and one of which is a methods course in the 272 or 273 series. (All three courses must be taken for a letter grade and both the theory and methods courses must be counted toward a grade of B or better) Competence in methodology must also be documented by prepa-
ration of an acceptable research paper. The depart-
ment members of the student’s qualifying examina-
tion committee will determine the acceptability of the paper.

There is no foreign language requirement for the M.A. degree.

Ph.D. Requirements. A master’s degree is re-
quired. Students who have taken the M.A. at an-
other university must meet the basic course re-
quirements for M.A. students at Berkeley.

Before the qualifying examination, the student must have completed (beyond any work taken for the M.A.) three graduate sociology courses or semi-
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2. Principles of Sociology. (4) Not open to students who have taken 1. Three hours of lecture per week. An introduction to the fundamental problems of human life—social organiza-
tion, culture, interaction processes and socialization— and the dynamics of modern society. Satisfies pre-
requisite; must fulfill the methods requirement. Most students enrolling for the first time are advised to take both Sociology 105 and 106. (F,SP)

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2. Principles of Sociology. (4) Not open to students who have taken 1. Three hours of lecture per week. An introduction to the fundamental problems of human life—social organiza-
tion, culture, interaction processes and socialization— and the dynamics of modern society. Satisfies pre-
requisite; must fulfill the methods requirement. Most students enrolling for the first time are advised to take both Sociology 105 and 106. (F,SP)
Upper Division Courses

101A. Sociological Theory. (5) Three hours of lecture and two hours of discussion per week. Prerequisites: 1 or 3 or consent of instructor. History of social thought as a source of present-day problems and hypotheses. (F)

101B. Sociological Theory. (5) Three hours of lecture and two hours of discussion 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 course presumes a general background in social theory. Consult instructor as to whether your background is appropriate.

102A. Contemporary Marxist Social Science. (4) Three hours lecture per week. (SP)

102B. Feminist Theory. (4) Three hours lecture per week.

105. Introduction to Sociological Methods. (5) Three hours of lecture and two hours of discussion per week. Prerequisites: 5 or consent of instructor. Problems of research design, measurement, and data collection, processing, and analysis will be considered. Attention will be given to both qualitative and quantitative studies. (F)

106. Intermediate Sociological Methods. (5) Three hours of lecture and two hours of discussion per week. Prerequisites: 105. This course will cover more technical issues in quantitative research methods introduced in 105, and will include, according to discretion of instructor, a practicum in data collection and analysis. Recommended for students interested in graduate work in sociology or research careers. (SP)

110. Organizations and Institutions. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Administrative organizations and voluntary associations; major social institutions in industry, government, religion, and education. (F)

111. Sociology of the Family. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Systematic and comparative analysis of family structure and change: marriage, reproduction, child-rearing, marital dissolution. (SP)

113. Sociology of Religion. (4) Three hours of lecture per week. Prerequisites: 1 or 3 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. (F)

113C. Sociology of Education. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. The role of formal education in modern society. Educational institutions in relation to the religious, cultural, economic, and political forces shaping their character. (F,SP)

114. Sociology of Law. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Legal rules, legal processes, and theories developed with respect to 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. (SP)

115. Deviance and Social Control. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. A consideration of forms, causes, and controls of deviant behavior. (SP)

116. Industrial and Occupational Sociology. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. The labor force; social control within and of occupations and professions (professionalization, professional associations vs. labor unions, codes of ethics, legal controls); social structure of the work-place, work experience of the participants, relation of both to community and society. (SP)

117. Sport As a Social Institution. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Analysis of sport as social institution, its structure and functions; male-female role contrasts, race and sport; economics of sport; the roles of coach, athlete, fan. Emphasis on sport and the ideological struggle which has emerged. (F)

118. Comparative Institutions. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Comparison of selected social institutions; their relation to ideas and social change.

125. Urban Sociology. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. The natural causes, consequences of world urbanization; metropolitan areas; location and types of cities, social and demographic characteristics of urban populations. (SP)

126. Population. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Population in historical context as well as detailed coverage of population problems in contemporary society including population growth and the economy, aging of populations, contraceptive revolution, urbanization and environment. (F)

130. Social Stratification. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Recent trends in occupational stratification; social classes in local communities and the nation as related to interest organizations. (F)

131A. Race and Ethnic Relations: The United States Experience. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Course focuses on race and ethnic relations in the United States. Examination of historical experiences, contemporary circumstances and future prospects of racial and ethnic groups. Attention to the development of new forms and trends in relations between the dominant society and the Afro-American, Native-American, Asian-American and Latino sub-cultures. Political and social consequences of racial and ethnic stratification are explored. (SP)

131B. Race and Ethnic Relations: International Comparisons. (4) Three hours of lecture per week. Prerequisites: 1 or 3 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: social, economic, political, institutional, social psychological, and demographic processes. (F)

132. Selected Topics in Ethnic and Race Relations. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Attention will be focused on specific topics to the extent practical, depending on student need and interest. Topics include concentration on one ethnic group, consideration in depth of specific theoretical issues, or an examination of race relations from an international comparative approach. (SP)

133. Gender and Society: The Sociology of Women. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Historical development of women's roles, family, marriage, dating, career, family. Emphasis on changes in women's roles and the changing status of women. (SP)

134. Gender and Society: The Sociology of Men. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Social movement of men in American society examined from standpoints of socialization and role analysis; group structure, politics, and social change, and personal experience. (F)

135. Gender and Society: Sexual Diversity and Social Change. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. An examination and analysis of the significance of homosexuality in contemporary U.S. society. Included: traditions of Western thought and the role of institutions, the implications of social changes in sex-related social/political movements, socialization and the development of individual identity, and the implications of evolving public attitudes.

140. Political Sociology. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Political processes in organizations, the social bases of power. The role of social classes, occupational groups, and religious groups, and the influence of cultural values. (F)

141. Social Movements and Political Action. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. A consideration of forms, causes, and trends in relations between the dominant society and the Afro-American, Native-American, Asian-American and Latino sub-cultures. Political and social consequences of racial and ethnic stratification are explored. (SP)

142. Sociology of War and Conflict. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Focus on three thematic areas of the contemporary United States: government, resources, and cities. Stress on the importance of transition from the 1960's. Examination of how each sector is influenced by policy currents, economic trends, and social conflicts. (SP)

144. Ethnic Politics. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. An examination of the role that ethnicity plays in influencing the political behavior of individuals as well as an analysis of how the state in multi-ethnic countries interacts with ethnic groups.

150. Social Psychology. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. An exploration of major theoretical approaches in social psychology. The approaches may include: symbolic interactionism, neo-behaviorism, psychodynamic analysis, cognitive theories, interpersonal processes and theories of exchange. (F)

151. Personality and Social Structure. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. An analysis of the establishment and growth of personality, and of varieties of personality, as a consequence of social experience and an evaluation of social-psychological and sociological explanations of these developments. (SP)

153. Interpersonal Behavior in Small Groups. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. An examination of social psychological and research in group processes. Topics include: small group theory, communication, coalitions, and interpersonal conflict are examined in light of field and laboratory research.

155. Sociology of Illness and Medicine. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Social and cultural factors associated with the definition, occurrence, and experience of illness. Analysis of the socially-defined "sick role" and the systems of which it is a part. (SP)

156. Thought Reform, Influence and Social Control. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Thought reform (i.e., coercive persuasion, brainwashing) and extreme methods of social control in the Soviet Union, China, and in American cult organizations are analyzed.
American examples include religious, political and therapeutic cults. Issues of recruitment, management and the evolution of violence and terrorism are addressed. (F)

160. Sociology of Culture. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Study of human meaning systems, particularly as manifested in literature, music, and other media. Includes study of the evolutionary, reception, and aesthetic experience of cultural forms. (SP)

162. Sociology of Literature. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. The relation of literature to the social order and to systems of social control. Analysis of the social role of the writer. (F)

163. Sociology and Moral Philosophy. (4) Students who have taken 159 (quarter system) will receive no credit for 163. Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. This course considers the relations between sociology and moral philosophy through an examination of classical and contemporary studies in both fields. (F)

170. Social Change. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Study of major changes in modern societies: the sources and causes of these changes; the processes through which they spread; their meaning for individuals and institutions. (F)

171. Historical Sociology. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Study of the major concepts, problems and works of scholars in historical sociology. Particular attention is given to such topics as industrialization, revolution, transformation of social structure, social life, political authority, institutions and culture viewed from an historical and comparative perspective. (SP)

172. Development and Modernization. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Major theoretical perspectives on social change in new countries. 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. (F)

180. American Society. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Various aspects of American values and behavior patterns over time; comparison of differences from other developed nations. (SP)

181. Soviet Society. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Soviet Russia from 1917 to the present. Social structure, political and economic development, and contemporary Soviet society. (F)

183. Contemporary Chinese Society. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. 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. (F)

184. Social Structure of Communist Societies. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. Various aspects of the class system, economic life, nationality groups, the family, education, demographic factors; comparison of communist social structure with the West. (SP)

186. Irish Society. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. An introduction to Ireland since the 1840 famine. Aspects of the social, political, religious, and educational institutions are covered. Special emphasis is given to the causes and consequences of the division between Northern Ireland and the Republic. (SP)

189. Selected Topics in Area Studies. (4) Course may be repeated for credit when subject matter changes. Three hours of lecture per week. Prerequisites: 1 or 3 or consent of instructor. There will be a variation in areas studied, depending on the instructor in charge. Possibilities include concentration on one society or a particular aspect of one society, consideration in depth of specific theoretical or methodological issues within area studies, or comparative regional studies. (SP)

190. Seminar on Advanced Topics. (4) Course may be repeated for credit when topic changes. Two hours of lecture per week and individual conferences. Prerequisites: 1 or 3 or consent of instructor. Advanced study in sociology, with specific topics to be announced at the beginning of each semester. (SP)

190A-H190B. Senior Honors Thesis and Seminar. (4) Two hours of seminar per week and individual conferences. Credit and grade to be awarded upon completion of the sequence. Prerequisites: Restricted to senior honors candidates with suitable preparation (see description of major). Intensive study of individual topic to provide background for honors thesis which is completed during the second semester of the sequence. Group and individual conferences. (F,SP)

197. Field Study in Sociology. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a pass/no pass basis. Prerequisites: 1 or 3 and consent of instructor. Supervised experience relevant to specific aspects of sociology in off-campus organizations. Requires a faculty advisor and a written report. (F,SP)

198. Directed Group Study for Undergraduates. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: 1 or 3 and consent of instructor. Group study of selected topics which cross over course disciplines. (F,SP)

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: 1 or 3 and consent of instructor. Enrollment is restricted by regulations on pages 91-92. (SP)

Graduate Courses

200. Proseminar. (1) One 1-hour lecture per week. Must be taken on a passed/not passed basis. This proseminar is required of all first-year graduate students and is supervised by a regular faculty member. The seminar will familiarize students with faculty and their various research interests and of opportunities available for funding via research and teaching assistantships. The seminar will present students with 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. (F)

201. Sociological Theory. (4) Four hours of lecture per week. Prerequisite: 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. (F)

202. Advanced Study in Sociology Theory. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Particular theories 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. (F,SP)

202A. Classical Sociological Theory. (3) (F,SP)

202B. Contemporary Sociological Theory. (3) (F,SP)

202C. Systematic Sociological Theory. (3) (F,SP)

205. Supervised Preparatory Course Work. (3) Individual conferences, as well as class attendance. Prerequisites: Consultation with and approval of regular faculty member responsible. Introductory study of a sociological field, among those listed in the 280 section, including participation in the appropriate undergraduate course in that field and also including individual meetings with the faculty advisor and additional requirements as stipulated by that advisor. (F,SP)

205A. Law and Deviance. (3) (F,SP)

205B. Race and Ethnic Relations. (3) (F,SP)

205C. Political Sociology. (3) (F,SP)

205D. Organizations. (3) (F,SP)

205E. Industrial Sociology. (3) (F,SP)

205F. Family and Life Cycle. (3) (F,SP)

205G. Social Stratification and Class Analysis. (3) (F,SP)

205H. Development and Modernization. (3) (F,SP)

205I. Religion. (3) (F,SP)

205J. Urban Sociology. (3) (F,SP)

205K. Social Psychology. (3) (F,SP)

205L. Gender. (3) (F,SP)

205M. Culture. (3) (F,SP)

205N. Education. (3) (F,SP)

205O. Health and Medicine. (3) (F,SP)

205P. Area Studies. (3) Section may be repeated for credit as topic varies. (F,SP)

271A-271B. Methods of Sociological Research. (4) Four hours of lecture per week. Prerequisites: Consent of instructor. Credit and grade to be assigned at the end of each semester. A two-semester sequence covering research design and analysis techniques commonly employed in sociological research. The course involves statistical problems encountered in field work, historical and comparative inquiry, experimental research, and survey analysis. The second semester concentrates on techniques for gathering evidence; the second semester focuses on numerical techniques for analyzing evidence. (F,SP)

271C. Intermediate Quantitative Methods. (3) One 3-hour lecture per week. Prerequisites: 271B. Intensive instruction in multivariate statistics common to quantitative analysis in social research. The course covers multiple regression and methods for adapting the basic regression model to handle categorical and nonlinear variables. The emphasis is on practical issues including combining variables to form indexes, using graphics to present findings, and using SPSSX. Computer accounts are arranged for all students. Some experience with SPSSX is assumed. (F,SP)

272. Studies in Sociological Research Methods. (3) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: Consent of instructor. Course under this number involve pursuing graduate study in subfields of sociological research methods. Consult departmental catalog for current descriptions. (F,SP)

272A. Logic of Inquiry. (3) (F,SP)

272B. Survey Research. (3) (F)

272C. Comparative and Historical Research. (3) (F)

272D. Advanced Quantitative Research. (3)

272E. Participant Observation. (3) (SP)

272F. Mathematical Sociology. (3)

272H. Demographic Methods. (3) (F)

272I. Experimental Methods. (3)

273. Advanced Seminars in Research Methods. (3) Course may be repeated for credit. Two hours of seminar per week. Seminar in advanced sociological research methods. Consult departmental catalog for current descriptions. (F,SP)

273A. Survey Research. (3)

273B. Comparative/Hisrorical Research. (3)

273C. Participant Observation. (3)

273D. Mathematical Sociology. (3) (SP)

273E. Demographic Methods. (3) (F)

273F. Interview Methods. (3) (SP)

278. Advanced Study in Substantive Sociological Fields. Course may be repeated for credit. Two hours of lecture per week. Prerequisites: Undergraduate
601. Individual Study for Major'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 residence requirements for the doctoral degree. (F,SP)

Professional Courses

301. Professional Training: Teachers. (3-6) Units may not be used to meet unit or residence requirements for either the master's or doctoral degree. Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. (F,SP)

401. Professional Training: Research. (3-6) Course may be repeated for credit. Not applicable. 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. (F,SP)

Soil Science (College of Natural Resources)

Department Office: 108 Hilgard Hall, 642-0341
Chair: Henry Doner, Ph.D.

Professors:

Soil Science is a multidisciplinary department. Course offerings of the department support the undergraduate major in the soil environment.

Undergraduate Program

The soil environment major is designed for students who are interested in one of the most basic and important of the earth's resources, soil, and in areas such as soils and living organisms, environmental elements, human activities and welfare, or cultural values. It is an innovative major that allows students considerable latitude in constructing an individualized program of study, although based on a common core of courses that give solidity and cohesiveness to the major. Working closely with an adviser, students are encouraged to use imagination and creativity in constructing a course program to prepare for graduate studies or employment in both the private and public employment sectors. Depending on the particular combination of soil science, cognate area, and elective courses selected, students can qualify for graduate studies or employment in agriculture, soil and water management, environmental protection, soil survey, consulting, etc.

Courses offered by the Department of Soil Science further the College's Natural Resources and across the campus in such diverse but related studies as forestry, conservation and resource studies, botany, biochemistry, geology and geography. A number of these courses are of sufficient general interest to attract students who wish to expand their intellectual horizons by learning something about soils, plants, and their interrelationships which support all terrestrial life.

Graduate Program

The department participates in programs of graduate study leading to the M.S. and Ph.D. degrees. These emphasize background training, the development of specific skills, and scientific leadership. Areas of emphasis include interdepartmental graduate programs in soil science, plant physiology, microbiology, and agricultural and environmental chemistry. Areas of specialization include plant nutrition, soil microbiology, chemistry, soil-plant relationships, nutrient cycling, salinity research, forest soils, and pedology.

Lower Division Courses

*30. Soils and Their Significance to Society. (3) Three 1-hour lectures per week. Formerly Plant & Soil Biology 10. Introduction to soils; their properties, classification, distribution, and significance to society. Interpretation of soil and landscape characteristics in relation to land use, and repercussions of land misuse. Gersper

Upper Division Courses

*101. Development and Classification of Soils. (3) Three hours of lecture per week. Prerequisites: Geology 100A-100B, and Chemistry 1A-1B recommended. Formerly Plant & Soil Biology 101. Development, morphology, and classification of soils as related to genesis, geology and time. Soils as functioning parts of ecosystems; use of soils in archeological and paleoclimatic studies; anthropogenic effects on soils ecosystems. Amundson

*101F. Field Study of Soil Development. (1) Five day-long field trips. Prerequisites: Completion of or concurrent enrollment in 101. Formerly Plant & Soil Biology 101F. Five day-long Saturday field trips to locations in central California. The field study of soil development and morphology. Methods of soil morphology description; soil sampling; factors controlling soil development; relationship of soil morphology to land use; quaternary geology of central California; use of soils in dating landscapes. Amundson

*110. The Soil As a Medium for Plant Growth. (3) Three 1-hour lectures per week. Prerequisites: Chemistry 1A-1B and Math 164 or equivalent. Recommended 100, 101, 101F recommended. Formerly Plant & Soil Biology 112. Physical-chemical properties of soils influencing the distribution of environmentally and plant nutritionally important elements; the role of adsorption, solubility, and complexation in their mobility in soil; and

*On leave, spring

*Recalled to active service

*Recipient of Distinguished Teaching Award

1991-92

On leave, spring

On leave, fall
an evaluation of the influence of soil minerals and organic matter on their distribution between solid and aqueous phases. (SP) Doner

*120L. Soil Chemistry Laboratory. (2) Two 3-hour laboratories per week. Prerequisites: 100, 101, or 120; 110 may be taken concurrently. Formerly Plant & Soil Biology 110L. The application of routine and special laboratory techniques for the study of soil chemical properties. Doner

*130. Soil Microbiology. (2) Two 1-hour lectures per week. Prerequisites: Biology 1A-1B. Formerly Plant & Soil Biology 111. Introduction to soil microorganisms; diversity, ecology, and activity in relation to biogeochemical cycles, nitrification, and soil organic matter. Firestone

*130L. Soil Microbiology Laboratory. (2) Two 3-hour laboratories per week. Prerequisites: 130 (or taken concurrently). Formerly Plant & Soil Biology 111L. Laboratory work to acquaint the student with soil microorganisms, their isolation and handling, and the measurement of their activities in soil. Planned to accompany lectures in 130. Firestone

*140. Soil Physics. (4) Two 1-hour lectures and two 3-hour laboratories per week. Prerequisites: 100 and Math 10. Formerly Plant & Soil Biology 102. Physical characterization of soils; soil water potentials; transport of water, gases, and heat in soil. Staff

*150. Soil Hydrology. (4) Two 1½ hour lectures and one 3-hour laboratory per week. Prerequisites: 140. An introduction to fundamental hydrologic processes and modeling concepts. The emphasis is on forested and rangeland catchments with applications to wildland watershed management. Logue

*170. Soil and Water Conservation. (2) Two 1-hour lectures per week. Formerly Plant & Soil Biology 161. Principals of soil management for sustained agriculture, water quality control, and environmental protection. Soil erosion, soil fertility, soil and plants in the hydrologic cycle are the major topics. Sposito

175. Soil Resource Evaluation. (3) Three 1-hour lectures per week. Prerequisites: 100 or equivalent or consent of instructor. Formerly Plant & Soil Biology 162. Review of land-use patterns and land-management practices in relation to soil resource suitability and environmental impact. Evaluation of soil use capability and repercussions of land misuse. Interpretation of soil research data and soil survey information in making land-use decisions. (F) Gersper

190. Senior Seminar. (1) One hour of student seminars and one hour of discussion per week. Prerequisites: Senior standing. Formerly Plant & Soil Biology 169. Students to integrate the knowledge obtained in the natural sciences, economic, and political aspects of soil resource management or plant and soil biology. (SP) Staff

*198. Directed Group Study. (1-3) Course may be repeated for credit. One hour of lecture/discussion per week. Must be taken on a pass/no-pass basis. Prerequisites: Upper division standing. Formerly Plant & Soil Biology 198. Selected topics in Soil Science for advanced undergraduates. Staff

*198R. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. One hour of lecture/discussion per week per unit. Must be taken on a pass/no-pass basis. Prerequisites: Upper division standing. Formerly Plant & Soil Biology 198R. Advanced study or supervised research in Soil Science. Staff

Graduate Courses

202. Modeling Ecological and Meteorological Phenomena. (3) Two 1½ hours of lectures per week. Prerequisites: Energy Resources 102 or consent of instructor. Modeling methods in ecology and meteorology; stability analysis; effects of anthropogenic stress on natural systems. (Also listed as Energy and Resources 202 and IDS 202.) (F)

*220. Advanced Soil Chemistry. (2) Two 1-hour lecture per week. Prerequisites: 120; Chemistry 130A or equivalent. Formerly Plant & Soil Biology 212. Trace element chemistry and adsorption mechanisms to soil materials; organic-mineral interactions; and applications of chemical thermodynamics to soil systems. Doner

*221. Soil Surface and Colloid Chemistry. (3) Three 1-hour lectures per week. Prerequisites: Chemistry 130A or consent of instructor. Formerly Plant & Soil Biology 213. Structure and coordination chemistry of soil adsorbents; nature of the solid-liquid interface in soils; solute adsorption mechanisms and theoretical models; soil colloidal phenomena; interparticle forces and chemical factors influencing soil aggregate formation. Sposito

*230. Advanced Soil Microbiology and Biochemistry. (3) Three 1-hour lectures per week. Prerequisites: 140. Formerly Plant & Soil Biology 202. Special topics in soil physics and chemistry of the plant environment with emphasis on the soil-plant-atmosphere flow of water. Staff

250. Vadose Zone Modeling. (3) Two 1½ hour lectures per week. Prerequisites: 150, Fortran, Partial Differential Equations, or permission of instructor. An introduction to finite-difference and finite-element methods of numerical modeling. Applications are for soil hydrology, contaminant transport, and streamflow generation. Logue

251. Advanced Topics in Hillslope Hydrology. (3) Course may be repeated for credit. Three hour seminar per week. Prerequisites: 150, Geology 117, or permission of instructor. Seminar will focus on runoff generation mechanisms and hillslope development processes. Topics will vary and include unsaturated and preferential flow, erosion and solute transport. Current papers from foreign and domestic reviews are reviewed. Logue

290. Seminar in Soil Science. (1) Course may be repeated for credit. One hour of seminar and one hour of discussion per week. Prerequisites: Graduate standing in soil science or related field. Formerly Plant & Soil Biology 235. Graduate student seminars on selected topics in Soil Science. Staff

*298. Special Study for Graduate Students. (1-4) Course may be repeated for credit. Four hours of research/laboratory per week per unit. Must be taken on a pass/no-pass basis. Formerly Plant & Soil Biology 298. Advanced study of research topics in soil science which vary each semester. Staff

*299. Research in Soil Science. (1-12) Course may be repeated for credit. Four hours of research/laboratory per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Soil Science or related field. Formerly Plant & Soil Biology 299. Research in Soil Science. Staff

*601. Individual Study for Master's Students. (1-6) Course may be repeated for credit. May be used to meet either unit or residence requirements for a master's degree. Four hours of research/laboratory per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Formerly Plant & Soil Biology 601. Individual study for the comprehensive or language requirements in consultation with the field advisor. Staff

*602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. May not be used for unit or residence requirements for the doctoral degree. Two 2-hour lectures or laboratories per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Soil Science or related field. Formerly Plant & Soil Biology 602. Individual study with the major field advisor, intended to provide an opportunity for qualified students to prepare themselves for the examinations required of candidates for the Ph.D. degree. Staff

Professional Courses

*300. Professional Preparation: Supervised Teaching of Soil Science. (1-4) Course may be repeated for credit. Individual conferences, and participation in teaching activities. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and appointment as a graduate student instructor. Formerly Plant & Soil Biology 300. Three hours in the Department of Soil Science at the University level; course content; problem set review and development; guidance of laboratory experiments; course development and evaluation; supervised practice teaching. Staff

Soil Science Graduate Group

(College of Natural Resources, Interdepartmental Graduate Group)

Office: 108 Hilgard Hall, 642-0341

Professors:

James Bartolome, Ph.D. (Forestry and Resource Management)

Harvey E. Doner, Ph.D. (Soil Science)

Mary K. Firestone, Ph.D. (Soil Science)

Willard R. Gardiner, Ph.D. (Soil Science, Forestry and Resource Management)

John Harte, Ph.D. (Energy and Resource Studies, Soil Science)

John G. McColl, Ph.D. (Soil Science)

James K. Mitchell, Ph.D. (Civil Engineering)

T. N. Narramore, Ph.D. (Soil Science and Mineral Engineering, Lawrence Berkeley Laboratory)

Arnold M. Schultz, Ph.D. (Forestry and Resource Management, Conservation and Resource Studies)

Garrison Sposito, Ph.D. (Soil Science)

Norman Terry, Ph.D. (Plant Biology)

Paul J. Zinke, Ph.D. (Forestry and Resource Management)

Associate Professors:

Ronald G. Amundson, Ph.D. (Soil Science)

Paul L. Gersper, Ph.D. (Soil Science)

Oenes C. Huisman, Ph.D. (Plant Pathology)

Assistant Professor:

Keith M. Logue, Ph.D. (Forestry and Resource Management)

Graduate Advisor: Mr. McColl

Graduate study in soil science is supervised by an interdepartmental group drawn from the staff of the Department of Soil Science and other departments in the University who have special qualifications and interest in supervising research in soil science. Both M.S. and Ph.D. programs are available. For admission the student must have a bachelor's degree in soil science or its equivalent in the biological or physical sciences. Previous completion of coursework in mathematics, physics, chemistry, biology, and several fields of biology will enhance admission opportunities and reduce the time required to complete graduate programs in this field.

Graduate study in soil science offers opportunities to study problems of increasing food and fiber production and maintaining these at high levels without adverse effects on the soil and plant ecosystem. The principal lines of study are soil chemistry, soil microbiology and biochemistry, soil morphology, soil physics, and soil-plant relationships. Research facilities include greenhouses with filtered air, pot culture areas, environmental growth chambers, and modern laboratories for diversified plant and soil studies. In addition to general laboratory equipment, there are instruments for atomic absorption spectroscopy, emission spectroscopy, gas chromatography, radiochemistry, and high performance liquid chromatography.
South and Southeast Asian Studies
(College of Letters and Science)

Department Office: 1203 Dwinelle Hall, 642-4564
Chair: Amin Sweeney, Ph.D.

Professors:
- George E. Bates, Ph.D. University of Pennsylvania, South Asian archaeology
- Robert P. Goldman, Ph.D. University of Pennsylvania, Sanskrit literature, Indian epic
- Amin Sweeney, Ph.D. University of London, Malay/Indonesian language and literature, oral tradition

Associate Professors:
- Bruce R. Pray, Ph.D. University of Michigan, Hindi/Urdu language and literature
- Jan Weisman, M.A. George Washington University, Thai language
- Barend A. van Nooten, Ph.D. University of California, South and Southeast Asian archaeology
- Sylvia Tiwon, Ph.D. University of California, Modern Indonesian literature

Lecturers:
- Norma Charles, B.A. Airlangga University, Indonesian language
- Kaushalya Hart, M.A. Annamalai University, Tamil language and literature
- Usha R. Jain, M.A. University of California, Hindi language
- Sally Sutherland, Ph.D. University of California, Sanskrit language, Indian mythology
- Ben Weissman, M.A. George Washington University, Thai language

Major Advisers: Hindi-Urdu, South Asian Civilization, Mr. Pray, Sanskrit, Mr. Goldman; South Asian Archaeology, Mr. Dales; Tamil, Mr. Hart; Malay-Indonesian, Mr. Sweeney.

Graduate Advisers: Mr. Goldman; Mr. Sweeney.

In addition, specific requirements for each South Asian emphasis are as follows:

I. South Asian Language

A. Hindi-Urdu: (1) Hindi-Urdu 1A-1B; (2) Hindi-Urdu 100A-100B; (3) South Asian 124; one other South Asian literature course in translation or one advanced Hindi-Urdu literature course; (4) South Asian 127 and one other course from List II below; (5) six upper division units to be chosen from Lists I through V below; (6) Linguistics 5 is recommended.

B. Sanskrit: (1) Sanskrit 100A-100B; (2) Sanskrit 101A-101B; (3) nine upper division units to be chosen from Lists I through V below; (4) Linguistics 5 is recommended; (5) South Asian 127 is optional.

C. Tamil: (1) Tamil 1A-1B; (2) Tamil 100A-100B; (3) South Asian 127 and one other course from List II below; (4) 12 upper division units to be chosen from Lists I through V below; (5) Linguistics 5 is recommended.

II. South Asian Archaeology

(1) 10 lower division units of a South Asian language or Sanskrit 100A-100B; (2) South Asian 110A-110B; Anthropology 2; Near Eastern Studies 123A-123B; Anthropology 133A; prerequisite, consent of instructor; (3) nine upper division units to be chosen from lists I through V below.

III. South Asian Civilization

(1) Sanskrit 100A-100B plus 15 upper division units or one year of a modern South Asian language (10 lower division units) plus 18 upper division units to be distributed as follows: a) one literature course from List I below; b) South Asian 127 and one other course in religion or philosophy from List II below; c) one course in history or social science from List III below; d) one course in the fine arts from List IV below; (2) remainder of required upper division units (either 15 or 18 as indicated above) to be selected from Lists I through V.

Courses recommended for fulfillment of the upper division unit requirement for the South Asian emphases:

List I. Literature: South Asian 121, 122, 124, 165.


List III. History and Social Science: South Asian 108, 130, 139; History 109A, 114A, 114B; Anthropology 184; Political Science 145A, 145B.


List V. Archaeology: Relevant courses in anthropology, geography, geology, statistics, or other departments as the student's specific field of archaeology requires.

With written permission from the student's adviser, other relevant courses may be substituted for not more than two of the courses listed above, particularly in the event that certain courses may not be offered each year or new courses may be added to the curriculum.

Honors Program.

To be eligible for admission to the honors program, a student 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 the University. An honors thesis is required. Students who wish to participate must choose a thesis topic in consultation with their major adviser and apply for admission to the program through the department office no later than the first week of spring semester of the senior year. Additional information concerning the honors program is available in the department office, 1203 Dwinelle.

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.

Minor in South Asian Civilization: This will provide students with a general introduction to the rich, diverse, and ancient cultures and civilizations of India. Required courses: Five upper-division courses from lists I-V:

I. South Asian 121, 122, 124; Hindi-Urdu 100A-100B; Sanskrit 101A-101B; Tamil 100A-100B.

II. South Asian 127, 128, 129, 131, 140, 141, 155, 160; Near Eastern Studies 142 and 144.

III. South Asian 108, 130, 139; History 109A, 114A, 114B; Anthropology 184; Political Science 145A, 145B.

IV. Art History 136A, 136B; Music 133A, 133B.

V. Relevant courses in anthropology, geography, geology, statistics, or others.

Minor in South Asian Archaeology: Students will be given a systematic introduction to the geographical, technological, and cultural bases for the origins and development of urban civilization in India and Pakistan. Required courses: six upper-division courses as follows:

1. South Asian 110A, 110B.
2. Four courses from lists I-V (see Minor in South Asian Civilization, above).

Graduate Program

Programs of graduate study and research leading to the M.A. degree are offered with emphases in Hindi and Urdu, Malay/Indonesian, Sanskrit, South Asian archaeology, South Asian civilization, and Tamil. Programs leading to the Ph.D. degree are offered with emphases in Malay/Indonesian, Modern Indo-Aryan: Hindi and Urdu, Sanskrit, South Asian archaeology, and Tamil.

Degrees. All students admitted to programs leading to a graduate degree will be expected to have, in addition to a B.A. or its equivalent, some formal academic background in South or Southeast Asian languages and area studies. Students should in

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*On leave, spring
**On leave, fall

+Recipient of Distinguished Teaching Award
general be prepared to have undergone training equivalent to that required of the departmental major in one of the various areas. M.A. candidates with insufficient preparation may be required to make up deficiencies without credit toward the M.A. unit requirement.

The M.A. degree is offered under Plan II (see Index under Graduate Division) which requires the student to take courses amounting to at least 24 upper division and graduate units, of which at least 12 must be graduate. The distribution of courses is determined in consultation with the graduate adviser, following the special requirements for each emphasis. All M.A. students are required to take the departmental colloquium, SSES 294. As part of the M.A. requirement, the student must pass a reading examination in a non-South or Southeast Asian language which the student and graduate adviser decide is relevant to the student's program, e.g., Dutch, French, German, Japanese, Russian. For the Malay/Indonesian emphasis, the student must pass a reading exam in Dutch. The language required for admission to the M.A. program cannot be offered for this reading requirement. In addition, first-year proficiency in a second area-related language is required for the M.A. emphasis in Hindi and Urdu, Malay-Indonesian, Sanskrit, and Thai. Students must be satisfied by passing a reading examination or by earning a satisfactory grade (B or better) in relevant course work. For the Malay/Indonesian emphasis, the language is to be chosen from: Sanskrit, Arabic, Javanese, Balinese, or other major Indonesian language.

Before being admitted to the comprehensive examination, students are required to submit to the graduate adviser two acceptable scholarly papers, one to be prepared in conjunction with SSES 294, and to fulfill the language requirements. Students must then successfully complete three written examinations, one in the general field and two in an area of specialization (toward which they have directed their reading and course work) and a final oral examination.

Except in unusual circumstances, a student must complete the M.A. program in at most four semesters. Further information about University degree regulations can be found in this catalog.

The general prerequisites for admission to the Ph.D. program are not a minor in the appropriate field. Students without such a M.A. degree would normally be advised to apply for admission to the M.A. program, even though their eventual goal is the Ph.D. degree. At the conclusion of the M.A. program, the student will be examined as to whether they are eligible for admission to the Ph.D. program. Students with an M.A. degree from another university will be expected to make up deficiencies in reading competence and to fulfill the requirements for the M.A. degree in this department, except for the comprehensive examination.

Students must demonstrate a reading knowledge of two languages relevant to the major field of interest. These languages will normally be selected from the following list: Dutch, French, German, Japanese, and Russian. Under special circumstances students may offer another language with the approval of the adviser. The foreign language requirement is normally met by passing a reading examination in each language. This requirement must be met before a student can take the qualifying examination.

Before being admitted to candidacy for the Ph.D., a student must demonstrate competence in the languages in his or her program, and must pass a written and oral qualifying examination in three fields of specialization. One of these fields may be in an area of study outside the department, to be decided in consultation with the graduate adviser. Examples of fields within the department are Hindi literature, Dravidian linguistics, Vedic, Prakrit, the Sanskrit grammarians; outside the department examples are Indian history and Indian art. Fields such as Indian philosophy and Buddhism can be studied both within and outside the department. For the Malay/Indonesian emphasis, examples of fields within the department are classical Malay literature, traditional drama, oral literature, Indonesian literature, Malaysian literature, dialect studies; outside the department, ethnography, near eastern studies and linguistics. Early in the Ph.D. program, students should consult with the graduate adviser and submit a statement of field, indicating how they will prepare themselves through reading and course work for the qualifying examinations. The examinations will be administered by a committee appointed by the Graduate Council.

After admission to candidacy, the student will complete the Ph.D. dissertation according to Plan A. The dissertation will conform to procedures and regulations set by the Graduate Division and the Graduate Council.

South and Southeast Asian

Upper Division Courses
H195. Senior Honors. (3) Prerequisites: Consent of instructor. To be eligible for admission for the honors program, Ph.D. program candidates must attain a minimum GPA of 3.5 in all courses completed for the major. In addition, the student must enroll in the final semester of the senior year in H195, a course of supervised research to be guided by an instructor chosen in consultation with the graduate adviser. On the basis of this research the student will prepare and submit an honors thesis for evaluation. (F,SP)
H195A. South Asian Studies. (3) (F,SP)
H195B. Tamil. (3) (F,SP)
H195C. Hindi-Urdu. (3) (F,SP)
H195D. Malay-Indonesian. (3) (F,SP)
H195E. Southeast Asian Studies. (3) (F,SP)
H195F. Sanskrit. (3) (F,SP)

198. Directed Group Study for Upper Division Students. (1-4) May be repeated for credit. Must be taken as part of an M.A. dissertation involving more than 24 units. In the M.A. dissertation, the student must have completed three graduate units of the departmental colloquium, SSES 294. The General Catalog should be consulted for further information and regulations.
South Asian Studies

Lower Division Courses

1A. Introduction to the Civilization of India. (3) Three 1-hour courses per week. Readings, lectures, and discussions in the culture and civilization of India from the Neolithic period through the rise and decline of South Asia's first urban civilization. Prerequisites: South Asian 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. Goldman

10A-10B. Origins of South Asian Civilization. (3,3) Students who have taken South Asian 193A-193B will receive no credit for 110A-110B. Three 1-hour lectures per week. A. Archaeology of the Neolithic through the Harappan civilization. Survey of archaeological evidence in Pakistan, India, and Afghanistan from Neolithic period through rise and decline of South Asia's first urban civilization. B. Post-Harappan to the emergence of Buddhist sangha and Mahayana scriptures in translation. Brief survey of the historical development of the Buddhist sangha and its impact on the peoples of South and Southeast Asia. (SP) Jaini

139. Women in India: Religion and Society. (3) Three hours of lecture per week. Besides studying a wide variety of material on images, definitions, roles, and activities of women, we will ask ourselves how it is possible to study "women in India" and we will consider how to relate western feminist understandings with Indian traditional and feminist viewpoints. Hess

140. Hindu Mythology. (3) Two 1-hour courses per week. Literary and religious aspects of Hindu myths. Reading of selected mythological texts in translation. (F) Goldman

141. Religion in South India. (3) Two 1-hour courses per week, 1a. Religion of South India. Emphasis will be on sources translated directly from Indian languages. Subjects covered include: the indigenous religion, the effect of Brahmanical religion, beliefs of modernists, and the practice of Hinduism in modern South India. (SP) Hart

149. Studies in South Asian Languages. (2-4) Course may be repeated for credit. Two to four hours of lecture per week. Directed study in South Asian language other than those regularly taught in the department. Staff

155. Philosophies of India. (3) Two 1-hour courses per week. The philosophies of India, Hindu and Buddhist, beginning with the Vedic period and concentrating on the classical systems. (F) Staal

160. Jainism and Other Heterodox Systems. (3) Three 1-hour lectures per week. Selected readings from the Jain scriptures and commentaries culminating in the 12th century A.D. Rise of other heterodoxies, particularly in the Vaisnavas in the South and the Nathas and Siddhas in the North. Jaini

165. India's Most Popular Epic: The Ramayana. (3) Three 1-hour lectures or two 1½ hour lectures per week. In its Sanskrit and vernacular versions, the Ramayana is probably the most influential literary work in India. Besides providing hundreds of millions with religious guidance and a compelling mythical world, it sets up ideal models for men, women, family, society, and state. Studying texts and varieties of performance, we will learn what the Ramayana is and how it lives in the culture. Hess

Graduate Courses

201. Readings in Jainas Sanskrit Texts. (3) Course may be repeated for credit. Three 1-hour classes per week. The aim of the seminar is to give the student a firsthand acquaintance with Jaina literature and practice through selections from both canonical and non-canonical sources, notably the Acharanga, Uttarahrdayaya, Samayasara and Tattvatracksastra, and relevant commentaries in Sanskrit. Jaini

205. Indian Paleography. (3) May be repeated for credit. Three hours of weekly classes and seminar. Prerequisites: Some familiarity with paleography. The course will be a survey of the paleographical materials in South and Southeast Asia and readings from early inscriptions in various Indian alphabets. Staff

210. Panini and the Indian Linguistic Tradition. (3) Course may be repeated for credit. Three 1-hour classes per week. Prerequisites: Some familiarity with linguistics and 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) van Nooten

212. Indian Philosophical Texts. (3) Course may be repeated for credit. Two 1½-hour classes per week. Prerequisites: Some knowledge of Sanskrit. Reading of Sanskrit texts on Indian philosophy (e.g., Sankara or other Vedanta and Mimamsa) for students with some knowledge of Sanskrit. Staal

215A-215B. Readings in Indian Buddhist Texts. (3,3) Course may be repeated for credit. One 1-hour class and one 2-hour class 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) Jaini

293. Seminar in South Asian Archaeology. (3) Course may be repeated for credit. Two 1½-hour classes per week. Prerequisites: Consent of instructor. Discussions of recent research and development of South Asian archaeology. Subject to be selected through consultation of students and instructor. (F) Dales

297. Archaeological Project in South Asia. (12) Forty hours of field work per week. Prerequisites: Consent of instructor. 10A, 10B or equivalent courses in archaeology, anthropology, natural science, or other related subjects. An intensive three month 40-hour per week field school at a major archaeological site. Excavation, surveying, and laboratory work for the period of one year. Written weekly reports plus a research paper based on finds from the excavations are required. Qualifications of participants determined by the director. (SP) Dales

Southeast Asian Studies

Lower Division Courses

10A-10B. Introduction to the Civilization of Southeast Asia. (3,3) Two 1½ hour or three 1-hour lectures per week. A. Archaeological evidence in the culture and civilization of Southeast Asia. Mainland Southeast Asia. Covers the modern day nations of Burma, Cambodia, Thailand, etc. with special emphasis on the impact of Hinduism and Buddhism.

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall

Recalled to active service
Recipient of Distinguished Teaching Award
B. Insular Southeast Asia: Covers the modern-day nations of Indonesia, Malaysia, and the Philippines. Special emphasis is given to the arts and their social and political context, with discussions on the impact of the colonial experience and the question of modernization vs. tradition. (F,SP) Staff, Tiwon

Upper Division Courses

*212. Orality and Literacy in Insular Southeast Asia. (3) Two 1 1/2 hour or three 1 hour lectures 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, commencing with oral tradition, progressing through manuscript and print culture into this electronic age. Sweeney


124. The Shadow-Play in Southeast Asia. (3) Two 1 1/2-hour classes 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. (F) Sweeney

128. Introduction to Modern Indonesian & Malaysian Literature in Translation. (3) Three 1-hour classes 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. (F) Tiwon

Graduate Courses

*291A. Oral Performance: Noetics and Poetics. (4) Three hours of seminar per week. Prerequisites: Consent of Instructor required. 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 IDS 291A, Rhetoric 291A, and Music 291A. Brinner, Connely, Sweeney

Hindi-Urdu

Lower Division Courses

1A-1B. Introductory Hindi and Urdu. (5;5) Five 1-hour classes plus one 1-hour laboratory per week. Hindi and Urdu writing systems. Survey of grammar. Graded exercises and readings drawn from Hindi and Urdu literature, leading to mastery of grammatical structures and essential vocabulary and achievement of the basic reading and writing competence. (F,SP) Jain

Upper Division Courses

100A-100B. Intermediate Hindi and Urdu. (5;5) Five 1-hour classes plus one 1-hour laboratory per week. Prerequisites: 1A-1B. Representative readings in Hindi and Urdu literature and expository prose, exploring the variety of literary forms and styles. Systematic study of grammatical and lexical problems arising from these readings. Advanced exercises in composition. (F,SP) Jain

Graduate Courses

220. The Hindi Short Story. (3) Course may be repeated for credit. Three 1-hour classes per week. Prerequisites: Two years of Hindi or equivalent. Reading and analysis of representative modern Hindi short stories. Emphasis on the evolution of the Hindi short story genre. (F) Hess

*221. Hindi Bhakti Poetry. (3) Course may be repeated for credit. Three 1-hour classes per week. Readings in the medieval Bhakti poets of the Hindi area: Kabir, Surdas, Mirabai, Tulsidas; readings in 20th century Hindi poetry. Hess

Malay/Indonesian

Lower Division Courses

1A-1B. Introductory Indonesian. (5;5) Five 1-hour classes plus one 1-hour laboratory per week. Prerequisites: 1A-1B. Readings in Indonesian texts, including newspapers, journals, and literature exploring a variety of styles. Systematic study of grammatical and lexical problems arising from these readings. Advanced exercises in composition, oral and written communicative skills, and cultural competence. (F,SP) Charles

132. Readings in Modern Indonesian and Malaysian Literature. (3) Two 1 1/2-hour classes per week. Prerequisites: Two years of Modern Indonesian or consent of instructor. 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. (F) Tiwon

*134. Readings in the Traditional Literature of the Malay World. (3) Two 1 1/2-hour or three 1-hour lectures per week. Prerequisites: Two years of Modern Indonesian or consent of instructor. This course serves two functions: it provides a survey of traditional Malay literature, involving study of texts from various periods; and it also offers advanced language instruction: Indonesian will be used in some lectures and in students' papers. Sweeney

*150. Advanced Indonesian. (3) Three 1-hour lectures per week. Prerequisites: 100A-B. This course will develop writing and speaking skills in a variety of styles. Emphasis will be placed upon the discourse of literary studies. Students will be required to write essays and make oral presentations in Indonesian. Staff

Graduate Courses

*210A-210B. Seminar in Malay Letters and Oral Traditions. (3;3) Course may be repeated for credit with consent of instructor. Three 1-hour classes per week. Prerequisites: 100A or equivalent. This course will focus on the oral literature of Indonesia and Malaysia. Students will be required to write essays and make oral presentations in Indonesian. Staff

Sanskrit

Upper Division Courses

100A-100B. Elementary Sanskrit. (5;5) Two 1-hour lectures, one 1-hour lecture and one 1-hour laboratory per week. Elements of Sanskrit grammar and practice in reading Sanskrit texts. (F,SP) Sutherland

*101A-101B. Intermediate Sanskrit. (5;5) Three 1-hour classes per week. Prerequisites: 100B. Readings from the Sanskrit epics and puranics; introduction to the kavya style of classical Sanskrit poetry; readings in the sastras. Sutherland, van Nooten

Graduate Courses

*200A-200B. Sanskrit Literature. (3;3) Course may be repeated for credit. Two 1-hour classes per week. Prerequisites: 101B or equivalent. Formerly 200, 201 and 202. Advanced readings in Sanskrit literature, including Sanskrit ornate poetry with emphasis on the canons of poetic analysis of the Indian aesthetic tradition. van Nooten

*203. Vedic Sanskrit. (3) Course may be repeated for credit. Three 1-hour classes per week. Prerequisites: 101B or equivalent. Readings from the Rigveda and other sacred texts, including Brahmanas and Upanishads. Knowledge of German and/or French is recommended. van Nooten

*204. Introduction to Vedic Ritual. (3) Course may be repeated for credit. One 3-hour lecture per week. Prerequisites: Two years of Sanskrit or consent of instructor. The main types of domestic (grihya) and Srauta rituals. Sources for the study of ritual. The Vedic schools and their principal texts. The Soma sacrifices. The principal recitations, chants and offerings. Discussion of representative textual passages and recordings. (F,SP) Sutherland

*206. Middle Indic. (3) Course may be repeated for credit. Three 1-hour classes 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 Abhayamarga. van Nooten

*207. Sanskrit Philosophical Texts. (3) Course may be repeated for credit. One 3-hour or two 1 1/2-hour seminars 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. Sutherland

*208. Buddhist Sanskrit. (3) Course may be repeated for credit. Two 1-hour seminars per week. Prerequisites: 2 years of Sanskrit or equivalent. Readings in the literature of North Indian Buddhist with emphasis on the grammatical features that distinguish it from classical Sanskrit and Pali. van Nooten

Tamil

Lower Division Courses

1A-1B. Introductory Tamil. (5;5) Five 1-hour classes per week. The grammar of modern Tamil will be covered followed by readings in simple texts. Practice will also be given in spoken Tamil. (F,SP) K. Hart

Upper Division Courses

100A-100B. Intermediate Tamil. (5;5) Five 1-hour lectures per week. Prerequisites: 1B. Readings from modern Tamil fiction; practice in speaking and composition; consideration of advanced topics in grammar. (F) K. Hart

Graduate Courses

210A-210B. Seminar in Tamil Literature. (3;3) Course may be repeated for credit with consent of instructor. Three 1-hour classes per week. Prerequisites: 100B. Readings in advanced Tamil. The exact texts to be determined by the needs of the student. (F,SP) G. Hart

Thai

Lower Division Courses

1A-1B. Introductory Thai. (5;5) Five 1-hour classes per week. Survey of grammar, graded exercises, readings drawn from Thai literature, leading to a mastery of
Spanish and Portuguese
(College of Letters and Science)

Department Office: 4319 Dwinelle Hall, 440-0471
Chair: Charles B. Fauthaber, Ph.D. (spring)

Jerry R. Croadock, Ph.D. (acting, fall)

Professors:
Arthur L. Askew, Ph.D. University of California at Berkeley.
Spanish, Portuguese Renaissance poetry
Jerry R. Croadock, Ph.D. University of California at Berkeley.
Modern Spanish literature
Dr. Donald G. W. Hall, Ph.D. Harvard University. Modern Spanish literature
Charles B. Fauthaber, Ph.D. Yale University. Medieval
Spanish literature
John H. Pott, Ph.D. University of California at Berkeley. Modern Spanish literature
Candido C. dos Santos, Ph.D. University of Florida. Brazilian
literature, Hispanic folk traditions
G. Arnold Chapman, Ph.D. (Emeritus)
Luís Monjardim, Licenciado en Derecho, L.L.D. (Emeritus)
Louis A. Murillo, Ph.D. (Emeritus)
Dorothy C. Shadi, Ph.D. (Emerita)
Robert K. Spaulding, Ph.D. (Emeritus)
Benjamin M. Woodbridge, Jr., Ph.D. (Emeritus)

Associate Professors:
Milton M. Azevedo, Ph.D. Cornell University, Linguistics
Emil I. B. Pfeiffer, Ph.D. Johns Hopkins University.
Spanish Golden Age literature
Arthur J. Castel, Ph.D. University of Arizona. Spanish
Golden Age literature, literary theory
Gay Finkelman, Ph.D. Princeton University. Modern
Spanish American literature
Francine R. Maselli, Ph.D. University of Michigan. Spanish
American literature

Assistant Professors:
Ignacio E. Navarrete, Ph.D. Indiana University. 16th-century
poetry and literary theory
Julio Romero, Ph.D. Brigham Young University. 19th- and 20th-century
Spanish American literature

Lecturers:
Hermilia Jimenez Mar, M.A. University of California at Berkeley.
Margherita Tortora-Ramos, M.A. of Texas, Austin
Lynde Wardman, Ph.D. Stanford University

Major Advisers: Option A: Ms. Bergmann, Mr. Ramos, Option B and C: Ms. Slater.

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 balance between language and literature and between Peninsular and Hispanic-American facets of a unified field.

Note: The programs of the department of Spanish and Portuguese were revised in 1990.

Students who started their programs under the old requirements may finish under either the old or the new requirements. Students who declare their majors after fall 1990 must follow the new requirements.

The Major in Spanish, Luso-Brazilian, Iberian, or Latin-American Languages and Literatures

Option A: Spanish and Spanish American

Lower Division. Courses 1, 2, 3, 4, and 25 (or their equivalents). Students transferring from other institutions with advanced standing and intending to 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 in the department, including Spanish 102A-102B, Spanish 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.

Single Subject Teaching Credential. Students seeking a teaching credential in Spanish as a single subject must take Spanish 100, Spanish 102A-102B, Spanish 104A-104B, Spanish 107A-107B, Spanish 112, Spanish 133, and Spanish 125. Consult the department for present evidence (by examination or otherwise) that their preparation includes the equivalent of Spanish 25.

Option B: Luso-Brazilian

Lower Division. Portuguese 1 and 2 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 equivalent requirements for the major, through without obtaining unit credit.

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 literature; Portuguese 107 and one other course in Portuguese literature; one course in Portuguese linguistics or theoretical approaches to literature; and four upper division electives, the offerings of the department, two of which may be in a related field of Spanish or Portuguese-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-102B, Catalan 101 or Portuguese 101; one course from the literature of Spain, and one course from the literatures of Portugal or Catalonia; five other courses in Spanish, Portuguese, or Catalan language, literature, linguistics, or culture, from the offerings of the department. In addition, students are required to complete two courses (upper or lower division) from outside the department, 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-102B; 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 Catalan 101, any or all of these courses may be excused and replaced by further electives as appropriate.

Honors Program. To be admitted to the honors program in Options A, B, or C, students must have completed at least two semesters of work at Berkeley with an overall grade-point average of at least 3.0 and a grade-point average of at least 3.3 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, preferably before, but not later than, the first semester of the senior year, half of the required course work, or give evidence, by special examination, of equivalent preparation. Students passing an examination in lieu of any of the required courses will be excused from the corresponding requirement for the major, though without obtaining unit credit.

Students in the honors program must complete the special honors course or two graduate courses, preferably in sequence, that require the writing of a major research paper. The special honors courses (Spanish 197A-197B or Portuguese 197A-197B) are offered each semester. These courses consist of independent study and the writing of a thesis under the direction of an appropriate member of the department.

The Minor in Spanish Language and Literatures; Minor in Luso-Brazilian Language and Literatures

Minor Adviser: Mr. Navarrete.

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 the courses to be completed at Berkeley; 4) No more than two of the courses may also be used for a major program of another department of group; 5) Courses in English translation and Spanish or Portuguese, but not both, may be counted toward the elective portions of the minor programs.

*On leave, spring
†Recipient of distinguished teaching award
‡Recipient of distinguished teaching award
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 1 and 2 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 Romance, 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. For students interested in Hispanic linguistics, medieval or Golden Age literature or Colonial Spanish American literature, two semesters of college Latin are recommended. Students must have completed 1200-level courses, including one course in historical or descriptive linguistics, and two courses in Spanish and Portuguese, of which at least six must be in strictly graduate-level (200-series) courses, in Latin American history, languages, and literatures.

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 Option B); (b) the completion of a comprehensive written examination in Spanish literature, linguistics, and Hispanic linguistics; (c) the passing of a comprehensive writing examination. The examination will include a written proficiency test in the student's area of specialization. Students other than Berkeley A.B. majors applying for admission to graduate work in the Department of Spanish and Portuguese should have an undergraduate preparation reasonably approximating that of the undergraduate major in Spanish at Berkeley.

The M.A. Program. The requirements for an M.A. degree in Spanish are an A.B. degree with a major in Spanish equivalent to the undergraduate major in Spanish at the University of California at Berkeley (Option A, a reading knowledge of another language, eight courses of postbaccalaureate work in Spanish, Portuguese, and Hispanic languages pertinent to the student's specialization.) Students other than Berkeley A.B. Spanish majors applying for admission to graduate work in the Department of Spanish and Portuguese should have an undergraduate preparation reasonably approximating that of the undergraduate major in Spanish at Berkeley.

The Ph.D. Programs. The Department of Spanish and Portuguese administers two doctoral programs. The Ph.D. Program in Hispanic Languages and Literatures, with emphasis on Spanish, requires a reading knowledge of Spanish and Spanish American literature and familiarity with Romance philology, with emphasis on Spanish. The Ph.D. Program in Portuguese, with emphasis on Portuguese, requires a reading knowledge of Portuguese, with emphasis on Portuguese-American literature. The chair, in consultation with the student's graduate advisor, will appoint a committee, which, during the student's first term in the 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 a specific, emphasized field to be selected in consultation with the graduate advisor who will chair the examination committee.

Procedures: No formal declaration of enrollment in the minor program is required. Upon completion of the program, however, students must file with the departmental adviser for the minor program to assure proper fulfillment of the requirements.

Spanish

Lower Division Courses

1. Elementary Spanish. (5) Five 1-hour classes and 1 1/2-hours of laboratory per week. Beginners' course. Not open to students who have completed two years or more of high school Spanish, or to native speakers. (F,SP)

10. Beginning Spanish for Graduate Students. Course may be repeated for credit. Three 1-hour classes per week. May be taken on a satisfactory/unsatisfactory basis. Preparation for the Graduate Reading Exam. (F)

2. Elementary Spanish. (5) Five 1-hour classes and 1 1/2-hours of laboratory per week. Formerly 4 and a portion of 2. Continuation of 1. Formerly 4 and a portion of 2. Continuation of 1. Formerly 4 and a portion of 2. Continuation of 1. (F,SP)

2G. Beginning Spanish for Graduate Students. Course may be repeated for credit. Three 1-hour classes per week. May be taken on a satisfactory/unsatisfactory basis. Preparation for the Graduate Reading Exam. (SP)

3. Intermediate Spanish. (5) Five 1-hour classes and 1 1/2-hours of laboratory per week. Formerly 2 or equivalent. Formerly 4 and a portion of 2. Continuation of 2. Course includes review and development of grammatical concepts taught in Spanish 1-2, as well as further practice in composition. (F,SP)

4. Intermediate Spanish. (5) Five 1-hour classes and 1 1/2-hours of laboratory per week. Formerly 3 or equivalent. Formerly 5 and a portion of 25. Continuation of 3. Development of grammatical concepts taught in Spanish 1-3 and further practice in composition. (F,SP)

5. Elementary Spanish for Hispanics. (5) Five 1-hour recitations and one 1 1/2 hours laboratory per week. Formerly 3 or equivalent. Course designed to increase vocabulary and to improve listening comprehension, pronunciation accuracy, grammar control, and speaking fluency by means of discussion, role playing, and laboratory work. Required only for students whose native language is not Spanish. Enrollment limit: 16 students per section. (F,SP)

21. Spanish for Bilingual Students, First Course. (3) Three 1-hour lectures and one 1-hour laboratory per week. Formerly Consent of instructor. Formerly 70. An elementary course for students whose native language is Spanish. (F,SP)

22. Spanish for Bilingual Students, Second Course. (3) Three 1-hour lectures and one 1-hour laboratory per week. Formerly Consent of instructor. Formerly 71. An intermediate course for students whose native language is Spanish. (F,SP)

25. Reading and Analysis of Literary Texts. (3) Three 1-hour classes per week. Formerly 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)

26. Advanced Spoken Spanish. (3) Three 1-hour lecture/discussion meetings per week. Formerly Consent of instructor. Course designed to increase oral communication skills at an advanced level, by means of practices of conversation and presentation in class. Some reading and writing, laboratory attendance, required. Not open to native speakers. (F,SP)

29. Hispanic Literature and the Female Imagination. (3) Two 1 1/2-hour lectures/semester per week. Freshman-Sophomore seminar in translation, presenting a range of readings from a wide geographical distribution of authors, Latin American, Chicana and peninsular Spanish. Study to the interrelationship between female imagination in the visionary mode and the autobiographical. The emphasis on the first will extend to women writers brings to bear a new perspective on topics of Latin American literature in general, and on the relationship between history and fiction. Readings are in English. (F)

40. Hispanic Culture. (2) One 2-hour meeting per week. Formerly Consent of instructor. Formerly 4 and a portion of 5. Study of Hispanic culture from its origins until modern times. This course will examine the structures of value of the Hispanic people through significant areas of cultural expression, including literature and the visual arts. Within this context, emphasis will be placed on the historical continuity of Hispanic culture and on the transformations of Hispanic societies. Enrollment will be limited.
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 1-hour lectures per week. (F,SP) Azevedo (F); Craddock (SP)

102A. Advanced Grammar and Composition. (3) Three 1-hour classes per week. Prerequisites: 25 or equivalent. (F) Navarrete

102B. Advanced Grammar and Composition. (3) Three 1-hour classes per week. Prerequisites: 25 or equivalent. (F,SP) Staff

104A. Survey of Spanish American Literature. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. Beginnings to 1880. (F,SP) Ramos (F); Durand (SP)

104B. Survey of Spanish American Literature. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent, 1880 to the present. (F,SP) Kirkpatrick (F); Masotti (SP)

107A. Survey of Spanish Literature. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. Beginnings to 1700. (F) Bergmann

107B. Survey of Spanish Literature. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. 1700 to the present. (SP) Doughtery

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. (SP)

109. Spanish Drama of the 16th and 17th Centuries. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent.

110. The Generation of '98. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. Analysis and discussion of selected works by Unamuno, Azorin, Valle-Inclan, etc.

111A-111B. Cervantes. (3;3) Three hours of lecture/seminar per week. Prerequisites: 25 or equivalent. Analysis and discussion of selected works by Cervantes, including his dramatic output. (F,SP)

112. Studies in Spanish Culture. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. Analysis of selected works by Azorin, Valle-Inclan, etc.

113. Studies in Latin American Culture. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. An overview of the culture of Spain, through emphasis on selected works. (SP) Navarrete

114. The Contemporary Spanish American Novel. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. (SP) Kirkpatrick

115. Lyric Poetry of the Golden Age. (3) Three hours of lecture/discussion per week. A study of 16th- & 17th-century lyric poetry from the Cancionero of Juan del Encina, through the first wave of Italian influence (Boscan, Garcilaso), the mystic poets (San Juan, Fray Luis), the religious and the great poets of the Baroque (Gongora, Quevedo, Lope de Vega). (SP)

123A-123B. Modern Spanish Prose Fiction. (3;3) Three hours of lecture per week. Prerequisites: 25 or equivalent. (F,SP)

125. Spanish Phonetics. (3) Two 1-hour classes and one 1-hour laboratory per week. Prerequisites: 25 or equivalent. Training in phonetic transcription; exercises in laboratory; contrastive (English-Spanish) phonetics. (F,SP) Azevedo (F); Craddock (SP)

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. Development in Spain's literature since 1939. (SP)

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 as topic varies. Three 1-hour lectures per week. Prerequisites: 25 or equivalent, Brief panorama of the American short story, beginning with Modernism, emphasis on two or three different types, e.g., fantastic, realistic, humorous, etc.

133. Hispanic Avant-Garde Literatures. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. Experimentation, innovation, and the dada movement in the 1920's, in Spain, Spanish America, or both. (SP)

135. Studies in Hispanic Literature. (3) Course may be repeated for credit when topic changes. Three 1-hour lectures per week. Prerequisites: 25 or equivalent. (SP)

142. The Spanish American Novel in English Translation. (2) Two hours of lecture per week. Discussion of the Spanish-American novel from its beginnings, through the first wave of translated twentieth-century novels. (SP)

147. Spanish Authors in Translation. (2) Two hours of lecture per week. Reading and discussion of selected Spanish authors, in English translation.

179. Advanced Course in Hispanic Linguistics. (3) Course may be repeated for credit when topic changes. Three 1-hour lecture per week. Prerequisites: 100 or consent of instructor. (F,SP) Craddock

185. Senior Course in Hispanic Literature. (2) Course may be repeated for credit when the topic changes. Two hours of lecture/seminar per week. Prerequisites: 25 or equivalent. Analysis and discussion of selected works of Don Quijote and others in the 16th- & 17th-century lyric poetry from the Cancionero of Juan del Encina, through the first wave of Italian influence (Boscan, Garcilaso), the mystic poets (San Juan, Fray Luis), the religious and the great poets of the Baroque (Gongora, Quevedo, Lope de Vega). (SP)

195A. Spanish Honors Course. (3) Individual conferences. Prerequisites: 25 or equivalent. Senior honors standing. Limited to ten seniors. (F) Craddock

195B. Spanish Honors Course. (3) Individual conferences. Prerequisites: 25 or equivalent. Senior honors standing. Limited to ten seniors. (SP) Craddock

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. Prerequisites: Consent of the instructor. Students will assist in the teaching of Spanish in local elementary and secondary schools. They will meet regularly with the instructor in charge and submit written reports. (F,SP)

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. Prerequisites: Senior honor status plus prepa ration and 25. Enrollment restricted by regulations on pages 91-92 of the General Catalog; restricted to senior honor students, etc. (F,SP)

Graduate Courses

200. Proseminar. (1) One and 1/2 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 will grow specific to fields of research, and questions currently being debated across the profession. The readings for the course will consist of 12 photocopied articles or chapters of books provided by the Department's faculty. (F)

201. Contrastive Linguistic Analysis. (3) Students may not receive credit for both Portuguese 201 and Spanish 201. Two hours lecture per week. A study of grammatical structure, with emphasis on the contrastive analysis of selected aspects of English, Spanish, and Portuguese. Recommended for preparation for the linguistics part of M.A. examination. (F) Azevedo

202. History of the Spanish Language. (3) Two or three hours lecture per week. Formerly 202A. A survey of the development of Spanish from prehistoric times to the present, particular emphasis on the Spanish influence (Boscan, Garcilaso), the mystic poets (San Juan del Encina, etc.), the second Italianate poets (Herrera), the great poets of the Baroque (Gongora, Azorin, Valle-Inclan, etc. "< Analysis and discussion of selected works by Unamuno, Azorin, Valle-Inclan, etc. "< Analysis and discussion of selected works by Cer tas: 100 or consent of instructor. (SP) Craddock

221. Major Prose Authors of the Golden Age. (3) Two or three hours lecture per week. (F) Bergmann

222. Major Poets of the Golden Age. (3) Two or three hours lecture per week. (F)

224. Major Dramatists of the Golden Age. (3) Two or three hours lecture per week. (SP)

225. The Spanish Enlightenment. (3) Two or three hours lecture per week. (F)

226. Spanish Romanticism. (3) Two or three hours lecture per week. (SP)

227A. The Spanish Novel Since 1850. (3) Two or three hours lecture per week. (F) Polt

227B. The Spanish Novel Since 1850. (3) Two or three hours lecture per week. (SP)

228. Modern Spanish Drama. (3) Two or three hours lecture per week. (SP)

229. Modern Spanish Poetry (After Romanticism). (3) Two or three hours lecture per week. (F)

232. Colonial Spanish American Literature. (3) Two or three hours lecture per week. (F)

234A. Modern Spanish American Poetry. (3) Two or three hours lecture per week. A comprehensive survey of poetry in Latin America from 1880-1920, on the poetics of modernism and the influence of the work of Ruben Dario and the heritage of Symbolism in Latin America. (F) Kirkpatrick

234B. Modern Spanish American Poetry. (3) Two or three hours lecture per week. (SP)

236A. Modern Spanish American Prose. (3) Two or three hours lecture per week. (F)

236B. Modern Spanish American Prose. (3) Two or three hours lecture per week. (SP)

240. Techniques of Literary Scholarship. (3) One 2 or 3 hour lecture/seminar per week. (F) Askins

242. Literary Theory and Criticism. (3) May be repeated for credit when topic changes. Must be taken on a pass/unsatisfactory basis. Special attention given to the works of Ruben Dario and the heritage of Symbolism in Latin America. (F) Kirkpatrick

246. Hispanic Paleography. (3) One 2 or 3 hour lecture/seminar per week. (SP)

*Not offered 1991-92
*On leave, spring, fall
*On leave, fall
260. Cervantes. (3) May be repeated for credit when topic changes and on permission of instructor. One 2 or 3 hour lecture/seminar per week. Prerequisites: 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 change according to the needs and interests of members of the course, but will address such issues as the place of Cervantes' works in literary history, the background contexts of Cervantes' works, and contemporary approaches and movements in Cervantes criticism. (F,SP)

270. The Colonial Period in Spanish America. (3) May be repeated for credit. One 2 or 3 hour lecture/seminar per week. (F,SP) Durand

276A. The Spanish American Novel. (3) One 2 or 3 hour lecture/seminar per week. (SP)

276B. The Spanish American Novel. (3) One 2 or 3 hour lecture/seminar per week. (SP)

278. The Literature of a Single Spanish American Country. (3) May be repeated for credit when topic changes. One 2 or 3 hour lecture/seminar per week. (SP)

280. Seminar in Spanish American Literature. (3) May be repeated for credit when topic changes. One 2 or 3 hour lecture per week. (SP) Ramos

285. Seminar in Spanish Literature. (3) May be repeated for credit when topic changes. One 2 or 3 hour lecture per week. (F,SP) Navarrete (F); Faulhaber (SP)

287. Special Seminars in Hispanic Literature. (1-5) Two 1/2 hour lectures per week for four weeks. Must be taken on a satisfactory/unsatisfactory basis. Special Seminars in Hispanic Literature. Course may be repeated for credit when topic changes. (SP)

289. Special Study for Graduate Students. (2-6) Course may be repeated for credit. Individual Conferences. Prerequisites: Graduate standing. Individual conferences or special programs of study or research in a restricted field not covered by available courses or seminars. (F,SP)

290. Special Study for Masters Students. (3) May not be used to satisfy unit and residence requirements for the Master's degree. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 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)

501. Individual Study for Masters Students. (3) May not be used to satisfy unit and residence requirements for the Ph.D. degree. May be repeated for credit. Individual conferences. Prerequisites: Approval of graduate adviser. Individual study, subject to the approval of the graduate adviser, 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) May not be used to satisfy unit or residence requirements for the Ph.D. Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Approval of graduate adviser. Individual study, subject to the approval of the graduate adviser, 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, grading and testing, class preparation, textbook evaluation, course design, includes language laboratory observations and supervised classroom practice. Required for all new graduate student instructors. (F) Kerr

302. Practicum in College Teaching of Spanish and Portuguese. (3-4) May be repeated for credit. Three to six hours of classroom teaching with an equal number of supervision per week; evaluation conferences. Must be taken on a satisfactory/unsatisfactory basis. (F,SP) Azvedo

Portuguese

Lower Division Courses

1. Elementary Portuguese. (5) Five 1-hour classes and 1 1/2 hours of laboratory per week. Formerly 1 and a portion of 2, the instructor's course. (F,SP)

2. Elementary Portuguese. (5) Five 1-hour classes and 1 1/2 hours of laboratory per week. Prerequisites: 1 or equivalent. Formerly a portion of 2 and 3: Continuation of 1. (F,SP)

3. Intermediate Portuguese. (5) Five 1-hour classes and 1 1/2 hours of laboratory per week. Prerequisites: 2 or equivalent. Continuation of 2. (F,SP)

4. Intermediate Portuguese. (5) Five 1-hour classes and 1 1/2 hours of laboratory per week. Prerequisites: 3 or equivalent. Continuation of 3. (F,SP)

5. Spoken Portuguese. (4) Five 1-hour lecture/discussion meetings per week. Prerequisites: 2 or equivalent. Course designed to increase vocabulary and to improve listening comprehension, pronunciation accuracy, grammar control, and speaking fluency, by means of oral expression practice. Some reading/lab/ oralatory work required. Not open to native speakers. (F,SP)

6. Intermediate Portuguese. (5) Five 1-hour classes and 1 1/2 hours of laboratory per week. (SP) Wiedemann

7. Beginning Portuguese. (5) Five 1-hour classes and 1 1/2 hours of laboratory per week. Prerequisites: 2 or equivalent. Course designed to develop control of oral communication skills at an advanced level, by means of practice of conversation and presentation in class. Some reading and writing, laboratory attendance required. Not open to native speakers. (F,SP)

8. Spoken Portuguese. (3) Three 1-hour lecture/discussion meetings per week. Must be taken on a passed/not passed basis. Prerequisites: 11 or equivalent. Course designed to develop control of oral communication skills at an advanced level, by means of practice of conversation and presentation in class. Some reading and writing, laboratory attendance required. Not open to native speakers. (F,SP)

9. Upper Division Courses

(Unless otherwise indicated, 20 units or equivalent credit. May be repeated for credit when topic changes. One 2 or 3 hour lecture per week. Prerequisites: Restricted to students in the major. May be repeated for credit when topic changes. (F,SP)

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. An intensive course for students with no previous 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 coursework. (F)

101B. Portuguese for Advanced Students: workshop. (2) Two 1 hour workshops per week. Prerequisites: Credit of 16-20 units or equivalent of another romance language, or consent of instructor. Must be taken concomitantly with 101A. No Independent registration. Emphasis on understanding, speaking and writing Portuguese. Taken in conjunction with Portuguese 101A, the course provides an intensive introduction to the language. (F)

102. Readings in Portuguese. (3) Three hours of lecture/discussion per week. Prerequisites: 101A-101B or equivalent. This course focuses on a variety of texts with special emphasis on 20th-Century Brazil. Discussion in Portuguese; reinforcement of language skills. (F,SP) Wiedemann

103. Advanced Grammar and Composition. (3) Three hours of lecture/discussion 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)

104. Introduction to Brazilian Literature. (3) Two 1 1/2 hour lectures per week. Prerequisites: 4 or equivalent. A survey of Portuguese literature from the beginnings through the 20th Century. (SP) Wiedemann

113. Brazilian Civilization. (3) Three hours of lecture/discussion per week. The course presents an overview of major themes in Brazilian cultural expression with emphasis on the 19th and 20th centuries. Lectures in English, readings available in both English and Portuguese. (SP) Slater

114. Contemporary Brazilian Novel. (3) Three hours of lecture per week. Prerequisites: Twenty units or equivalent of Portuguese or another romance language. (F) Slater

125. Camoes. (3) Three hours of lecture per week. Prerequisites: Twenty units or equivalent of Portuguese or another romance language. (SP)

126. Twentieth-Century Brazilian Literature. (3) Three hours of lecture per week. Prerequisites: Twelve units of Portuguese or another romance language. (F)

127. Introduction to Portuguese Linguistics. (2) Two hours of lecture per week. Prerequisites: Twenty units or equivalent of Portuguese or another romance language. (SP)

144. Modern Brazil through the Novel. (3) Two 1 1/2 hour lectures per week. Open to students in all departments of the University. Lectures and discussion in English. Texts available in both English and Portuguese. Students may not receive credit for both Portuguese 144 and 114. (SP)

150. Introduction to Portuguese Linguistics. (2) Two hours of lecture per week. Prerequisites: Twenty units or equivalent of Portuguese or another romance language. (SP)

180. Special Study for Undergraduates. (2-3) Course may be repeated for credit. Individual conferences. Prerequisites: Twenty units or equivalent of Portuguese or another romance language. Consent of instructor. Special tutorial or seminar on selected topics. (F,SP)

H195A. Portuguese Honors Course. (3) Individual conferences. Prerequisites: Twenty units or equivalent of Portuguese or another romance language. Senior honors standing. Limited to senior honors candidates. Directed study centering on the preparation of an honors thesis (see Honors Program, Option B, above). (F)

H195B. Portuguese Honors Course. (3) Individual conferences. Prerequisites: Twenty units or equivalent of Portuguese or another romance language. Senior honors standing. Limited to senior honors candidates. Directed study centering on the preparation of an honors thesis (see Honors Program, Option B, above). (SP)

199. Supervised Independent Study and Research. (2-3) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Twenty units or equivalent of Portuguese or another romance language. Restricted to senior honor students with an adequate preparation for the subject proposed for special study, and by previous arrangement with members of the departmental staff. (F,SP)
### Graduate Courses

**201. Contrastive Linguistic Analysis. (3)** Two hours of lecture per week. Prerequisites: Spanish 201. A study of grammatical structure, with emphasis on the contrastive analysis of selected aspects of English, Spanish, and Portuguese. Recommended as preparation for the linguistic part of the M.A. exam. Students may not receive credit for both Portuguese 201 and Spanish 201. (F)

**275. Critical and Stylistic Studies of a Single Author or Period. (3)** May be repeated for credit when topic changes. One 2-hour seminar per week. (F, SP)

**298. Special Study for Graduate Students. (3-6)** May be repeated for credit. Individual conferences. Prerequisites: Graduate standing. Individual conferences or seminars on special programs of study or research in a restricted field not covered by available courses or seminars. (F, SP)

**299. Special Advanced Study. (3-6)** May be repeated for credit. Individual conferences. Sections 1-20; letter grading; sections 21-40: S/U grading. Prerequisites: Restricted to students writing doctoral dissertations. (F, SP)

### Statistics

**Statistics (College of Letters and Science)**

**Department Office:** 367 Evans Hall, 642-2781

**Chair:** Terence P. Speed, Ph.D.

**Professors:**

- David J. Aldous, Ph.D. Cambridge University. Theoretical and applied probability
- Raphael M. Beran, Ph.D. California Institute of Technology
- Peter J. Bickel, Ph.D. University of California at Berkeley. Nonparametric inference, stochastic processes
- Leon Breiman, Ph.D. University of California at Berkeley. Computer-oriented multivariate methodology
- Charles J. Stone, Ph.D. Stanford University. Nonparametric statistics
- David A. Freedman, Ph.D. Princeton University. Statistical inference, probability
- Leo A. Goodman, Ph.D., D.Sc. (Hon.) Princeton University. Applied statistics, statistical methods for the social sciences
- Joseph H. Hodges, Jr., Ph.D. University of California at Berkeley. Nonparametric inference, stochastic processes
- Nicholas P. Jewett, Ph.D. University of Edinburgh. Biostatistics, surveys, geometric probability
- Michael J. Klass, Ph.D. Theoretical and applied probability
- Lucien LeCam, Ph.D. University of California at Berkeley. Asymptotic methods, stochastic modeling
- P. Wannik-Wilson, Ph.D. University of Illinois. Asymptotic theory, nonparametric, stochastic processes
- James W. Pitman, Ph.D. Mathematical statistics, stochastic processes
- John Rice, Ph.D. University of California at Berkeley. Applied statistics, stochastic processes in neurophysiology
- Terence P. Speed, Ph.D. Monash (Australia). Applied statistics
- Charles J. Stone, Ph.D. Stanford University. Nonparametric statistical methodology
- Aram J. Thomasian, Ph.D. University of California at Berkeley. Stochastic processes
- Kenneth W. Wachter, Ph.D. Cambridge. Multivariate analysis, data analysis, demographical data
- David Blackwell, Ph.D. (D.Sc.) (Emeritus)
- Albert H. Bowker, Ph.D., LL.D. (Hon.). (Emeritus)
- Lester E. Dubins, Ph.D. (Emeritus)
- Erich L. Lehmann, Ph.D., D.Sc. (Hon.) (Emeritus)

**Assistant Professors:**

- Steven Evans, Ph.D. Cambridge University. Probability theory
- Andrew Gelman, Ph.D. Harvard University. Medical imaging, political science
- Christian H. Hesse, Ph.D. Harvard University. Mathematical statistics, stochastic modelling
- Deborah Nolan, Ph.D. Yale University. Density estimation, empirical processes
- Philip Stark, Ph.D. Scripps Institution of Oceanography. University of California at San Diego. Inverse problems, geophysics

**Senior Lecturers:**

- Roger Purves, Ph.D. University of California at Berkeley. Foundations of probability, measure theory
- Juliet P. Shaffer, Ph.D. Stanford University. Linear models, simultaneous inference

**Statistical Laboratory:**

- Peter J. Bickel, Ph.D. (Director) University of California at Berkeley. Nonparametric inference, asymptotic methods

**Statistical Computing Facility:**

- Leo Breiman, Ph.D. (Director) University of California at Berkeley. Computer-oriented multivariate methodology

**Major Adviser:** Mr. Stone.

**Service Courses.** The department offers a variety of introductory service courses differing both in mathematical level and in topics emphasized.

**Courses 2 and 5 require only high school algebra; course 5 has more emphasis on probability than does 2. Courses 20, 21, and 25 require some calculus. Course 20 is a general course; 21 is intended for business students and 22 for engineers. Course 20A: 20B is a year upper division sequence, emphasizing inferential methods used in social and life sciences. Course 214 is a thorough beginning probability course. Course 225 treats inference concepts used in engineering and physical sciences.**

### Catalan

**Upper Division Courses**

101. Catalan for Advanced Students. (3) Three 1-hour classes per week. Prerequisites: Credit for 16-20 units or equivalent of another romance language, or consent of instructor. An intensive course for students with no previous study of Catalan. (SP)

102. Readings in Catalan. (3) Course may be repeated for credit when readings change. Three 1-hour classes per week. Prerequisites: 1 and 2 or 101 or consent of instructor. Selected readings in Catalan prose and poetry.

103. Survey of Modern Catalan Literature. (3) Course may be repeated for credit as topic varies. Three 1-hour lectures per week. Prerequisites: 1, 2 or 101, or consent of instructor. An introduction to modern Catalan literature from the nineteenth century to the present.

180. Special Study for Undergraduates. (2-3) May be repeated for credit. Individual conferences. Prerequisites: Twenty units or equivalent of Catalan or instructor’s consent. Special tutorial or seminar on selected topics. (F, SP)

### Graduate Courses

298. Special Study for Graduate Students. (3-6) May be repeated for credit as topic varies. Individual conferences. Prerequisites: Graduate standing. Individual conferences on special programs of study or research in a restricted field not covered by available courses or seminars. (F, SP)

### The Major

**Lower Division Courses. Required:**

- Mathematics 1A-1B and 50A-50B. Mathematics 50A and 50B must be taken with minimum grades of C in each. Transfer students should contact the undergraduate advisor in 367 Evans Hall about requirements for admission to the major. Recommended: Statistics 5 or 20. Familiarity with computer programming is very useful in statistical work.

**Upper Division Courses.** Mathematics 110; Statistics 101-102 or 103A-103B; and three courses from Statistics 150, 151A, 151B, 152, 153, 154, 155, and 156, including at least one course with a laboratory. Theoretical and either (i) two courses from Mathematics 104, 105, 113, 126, 128A, 135, and 185; or (ii) a program of three upper division courses from a field in which statistics is applied. The courses selected for the major must have the approval of the major adviser, who may authorize reasonable exceptions and substitutions.

**Double Major.** Students are encouraged to combine the statistics major with a major in mathematics, applied mathematics, computer science, or a field of statistical application.

**Honors Program.** Students with an overall 3.3 grade-point average or higher and a 3.3 grade-point average or higher in courses in the major may apply for admission to the honors program with the approval of the major adviser. The program consists of course H195, which includes reading in a special topic and writing a thesis.

**Engineering Mathematics Statistics.** The College of Engineering with the cooperation of the Department of Statistics offers a course in engineering mathematical statistics leading to the degree of Bachelor of Science. Major Adviser: Mr. Thomasion (see section on Program of Study in Engineering Science).

**Preparation for Graduate Study.** Those interested in the graduate statistics major should include in the undergraduate courses a strong foundation 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. Students interested in the Ph.D. degree at least at a year of upper division probability and statistics (or course 20A-20B) 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 Graduate Program

The department offers the M.A., Cand. Phil., and Ph.D. degrees. Information concerning the requirements for these degrees is available in the brochure Requirements for Higher Degrees in Statistics, available upon request from the department 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 biostatistics through the Interdepartmental Group in Biostatistics. There are graduate 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 biological sciences with a major interest in mathematics and statistics. For further information see Biostatistics. For course listings in Biostatistics, see Biomedical and Environmental Health Sciences.

### 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 led to A.B., M.A., and Ph.D. degrees in statistics. In 1955, the instruction activities in statistics were taken over by the newly established Department of Statistics. In recent times the laboratory has been the administration center for sponsored projects of the department. In addition, the laboratory offers a consulting service in statistics for graduate students and faculty in other disciplines. The consultants are Ph.D. students in statistics or biostatistics working under the supervision of a faculty member. The laboratory is currently developing a variety of interdisciplinary research projects involving collaboration between students and faculty of the statistical laboratory and other departments.
The Statistical Computing Facility

The Statistical Computing Facility provides computing support for the department. It currently houses over 30 SUN networked workstations, 3 VAX 11/750s, and many terminals, printers and other peripherals. There are also labs for both the graduate and undergraduate instructional programs. In addition, the facility offers high-level consulting assistance in statistical computing and is active in developing advanced statistical software.

**Lower Division Courses**

ONLY ONE LOWER DIVISION STATISTICS COURSE MAY BE TAKEN FOR CREDIT.

- Stat. 2: No credit allowed if you have credit for 2X, 5, 20, 21, 25.
- Stat. 2X: No credit allowed if you have credit for 2, 5, 20, 21, 25.
- Stat. 5: No credit allowed if you have credit for 2, 5X, 20, 21, 25.
- Stat. 20: No credit allowed if you have credit for 2, 5, 21, 25.
- Stat. 21: No credit allowed if you have credit for 2X, 5, 20, 25.
- Stat. 25: No credit allowed if you have credit for 2, 5, 20, 21.

Consult the undergraduate nonmajor advisor.

2. Introduction to Statistics. (4) Students who have taken 2X, 5, 20, 21, or 25 will receive no credit for 2.


20. Introduction to Probability and Statistics. (4) Students who have taken 2X, 5, 21, or 25 will receive no credit for 20. Three hours of lectures and two 1-hour laboratories per week. Prerequisites: One semester of calculus. For students with mathematical background who wish to acquire basic concepts. Relative frequencies, discrete probability, random variables, expectation. Testing hypotheses. Estimation. Illustrations from various fields. (F,SP)

21. Introductory Probability and Statistics for Business. (4) Students who have taken 2X, 5, 20, 21, or 25 will receive no credit for 21. Three 1-hour lectures and two 1-hour laboratories per week. Prerequisites: One semester of calculus. Descriptive statistics, probability models and related concepts, sample surveys, estimates, confidence intervals, tests of significance, controlled experiments vs. observational studies, correlation and regression. (F,SP)

21X. Introductory Probability and Statistics for Business-Self Paced. (4) Students who have taken 2X, 5, 20, 21, or 25 will receive no credit for 21X. Prerequisites: Take 2, 5, 20, 21, or 25. Descriptive statistics, probability models and related concepts, sample surveys, estimates, confidence intervals, tests of significance, controlled experiments vs. observational studies, correlation and regression. (F,SP)

25. Introduction to Probability and Statistics for Engineers. (3) Students who have taken 2X, 5, 20, 21, or 25 will receive no credit for 25. Three hours of lectures and one 1-hour laboratory per week. Prerequisites: A year of calculus. Emphasis on concepts and applications. Commonly used probability distributions. Expectation. Standard discrete and continuous distributions. Regression and correlation. Point and interval estimation. Illustrations from engineering. (F,SP)

98. Directed Group Study. (2) Two hours of group study per week. Must be taken on a Passed/Not Passed basis. Prerequisites: Approval Must be taken at the same time as either Statistics 2 or 21 and on a Passed/Not Passed basis. This course assembles lower division statistics students with structured problem solving, interpretation and making conclusions. (F,SP) Purves

**Upper Division Courses**

101. Introduction to the Theory of Probability. (4) Three 1-hour lectures and one 1-hour laboratory per week. Prerequisites: Math 50A-50B. Random variables and their distributions, expectation, univariate models, central limit theorem, statistical applications, dependence, multivariate normal distribution, conditioning, simulation and other computer applications. (F,SP)

102. Introduction to the Theory of Statistics. (4) Course may be repeated for credit. Three 1-hour lectures and one 2-hour laboratory per week. Prerequisites: 101. Properties and realism of probability models used in statistical theory. Normal, t, chi-square, and F distributions. Statistical inference, including point and interval estimation and hypothesis testing. (SP)

*103A. Intermediate Introduction to Probability and Statistics. (4) Three 1-hour lectures and one 2-hour laboratory per week. Prerequisites: 103A. Least squares method, confidence intervals and tests of hypotheses for normal linear regression models, maximum likelihood estimators and likelihood ratio tests for logistic regression and other discrete exponential linear models, chi square tests for multinomial models, interactive use of computer for statistical analyses. (F,SP)

*103B. Intermediate Introduction to Probability and Statistics. (4) Three 1-hour lectures and one 2-hour laboratory per week. Prerequisites: 103A. Least squares method, confidence intervals and tests of hypotheses for normal linear regression models, maximum likelihood estimators and likelihood ratio tests for logistic regression and other discrete exponential linear models, chi square tests for multinomial models, interactive use of computer for statistical analyses. (F,SP)

131A-131B. Statistical Inferences for Social and Life Sciences. (4) Three 1-hour lectures and two 2-hour laboratories per week. Prerequisites: Math 50B. Random variables, expectation, univariate models, central limit theorem, random vectors, multivariate normal distribution, conditioning, simulation and other computer applications. (F,SP)

150. Stochastic Processes. (3) Three hours of lecture per week. Prerequisites: 101 or 103A or 134. Random processes, including ratio, regression, and difference estimators. (SP)

151A. Applied Statistical Models. (4) Three hours of lecture and one 2-hour laboratory per week. Emphasis is on the mathematical theory of applied models and on techniques useful for the analysis and interpretation of real data. An introduction to statistical computer packages. Topics in multivariate statistical analysis such as: inference concerning multivariate means, multivariate regression and ANOVA, principle components, factor analysis, discrimination, classification, log linear models.

152. Sampling Surveys. (4) Three hours of lecture and one 2-hour laboratory per week. Prerequisites: 101 or 103A or 134 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, spectra. (SP)

154. Elements of Nonparametric Inference. (4) Three hours of lecture and one 2-hour laboratory per week. Prerequisites: 102 or 103B. Common nonparametric tests such as the sign, Wilcoxon, Kruskal-Wallis and rank correlation tests, and joint estimates and confidence intervals derived from these tests. Exact and asymptotic distribution theory, both in randomization and population models. (F)

155. Game Theory. (3) Three 1-hour lectures per week. Prerequisites: Two years of calculus. General non-zero-sum games, including matrix games, converting games in extensive form and continuous games, and illustrated by detailed study of examples. (F)

156. Bayesian Inference. (3) Three hours of lecture per week. Prerequisites: 102 or 103B. Calculation of conditional expectation and distribution. Structure of subjective probability. Construction of subjective probability distributions. Linear models, Dirichlet distributions. De Finetti's theorem. Optimal stopping and other design problems. (SP)

H195. Special Study for Honors Candidates. (1-4) Course may be repeated for credit. (F,SP) Staff

198. Directed Study for Undergraduates. (1-3) Course may be repeated for credit. Must be taken on a Passed/Not Passed basis. Prerequisites: Approval of instructor. Special tutorial or seminar on selected topics. (F,SP) Staff

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Must be taken on a Passed/Not Passed basis. (F,SP) Staff

Graduate Courses

200A-200B. Introduction to Probability and Statistics at an Advanced Level. (4) Three 1-hour lectures and one 2-hour laboratory per week. Prerequisites: Two years of calculus and one semester of linear algebra. Probability spaces. Random variables, distributions and applications. Limit theorems, properties, simultaneous confidence intervals. (F,SP) Purves

Markov chains, queueing theory, point processes, branching processes, renewal theory, stationary processes, Gaussian processes. (F,SP) Purves

151A. Applied Statistical Models. (4) Three hours of lecture and one 2-hour laboratory per week. Prerequisites: Math 110 and either Stat 102 or 103B or 135. Emphasis on the mathematical structure of applied models and on techniques useful for the analysis and interpretation of real data. An introduction to statistical computer packages. Topics in multivariate statistical analysis such as: inference concerning multivariate means, multivariate regression and ANOVA, principal components, factor analysis, discrimination, classification, log linear models.
hypothesis testing, linear models, large sample theory, categorical models, decision theory. (F,SP)

205A-205B. Probability Theory. (3,3) Three hours of lecture and two 2-hour laboratory 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. The course starts with a strong mathematical background. Measure theory concepts needed for probability, expectation, distributions. Laws of large numbers and central limit theorems for independent random variables. Estimation methods and functionals. Convergence expectations; martingales and theory convergence. Markov chains. Stationary processes. (F,SP)

206A-206B. Stochastic Processes. (3,3) Three 1-hour lectures per week. Prerequisites: A year of upper division probability and statistics. A course in linear algebra. A survey of mathematical statistics: in particular both small and large sample theories of hypothesis testing and confidence procedures where confidence intervals with applications to topics such as exponential families, univariate and multivariate linear models and nonparametric inference. (F,SP)

210A-210B. Advanced Theory of Statistics. (3,3) Three 1-hour lectures per week. Prerequisites: Some knowledge of real analysis and metric spaces, weak convergence, Brownian motion, diffusions, Levy processes, Markov processes, martingales, Gaussian processes and further topics. (F,SP)


216A-216B. Theory of Nonparametric Inference and Robust Methods in Statistics. (3,3) Three 1-hour lectures per week. Prerequisites: 210 or equivalent. Theoretical properties of significance tests, estimators and confidence procedures where confidence intervals with applications to topics such as exponential families, univariate and multivariate linear models and nonparametric inference. (F,SP)


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) Staff

030. Professional Preparation: Teaching of Probability and Statistics. (A) Course may be repeated for credit. One to two hours of lecture and 2-4 hours of laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and appointment as a graduate student instructor. Discussion, problem review and development, guidance of laboratory classes, course development; supervised practice teaching. (F,SP) Purves

278B. Statistics Research Seminar. (1-4) Course may be repeated for credit for a maximum of 16 units. May not be used for unit or residence requirements for the doctoral degree. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: One year of 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 the master's comprehensive and Ph.D. degree. (F,SP) Staff

Professional Courses

300. Professional Preparation: Teaching of Probability and Statistics. (A) Course may be repeated for credit. One to two hours of lecture and 2-4 hours of laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and appointment as a graduate student instructor. Discussion, problem review and development, guidance of laboratory classes, course development; supervised practice teaching. (F,SP) Purves

278B. Statistics Research Seminar. (1-4) Course may be repeated for credit for a maximum of 16 units. May not be used for unit or residence requirements for the doctoral degree. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: One year of 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 the master's comprehensive and Ph.D. degree. (F,SP) Staff

Subject A: English Composition

(College of Letters and Science)

Office: 216 Dwinelle Annex, 642-5570

Lecturers:
Ruth F. Beames, M.A.
Kimberly S. Davis, M.A. (Academic Administrator)
Mary Jane Freeland, M.A.
Sarena T. Johnson, M.A.
Gail Offer Brown, M.A.
Armond S. Robinson, M.Div.
Stephen K. Tollefson, M.A.

Subject A Program offers courses in satisfaction of the Subject A requirement. (See “University Requirements” in the section on undergraduate education for additional information.) Auditors are not permitted.

Lower Division Courses

1. Introduction to Language. (3) Three hours of lecture/discussion classes and one hour of tutorial per week. Prerequisites: Placement by examination. An introductory course leading to the proficiency in expository writing necessary for successful university work. Lectures, readings, discussions, regular writing assignments focusing on the nature and functions of language. A grade of C or higher fulfills the Subject A requirement. Two units recorded credit but recognized as 8 units of workload in computing study list. (F,SP) Staff
1C. Introduction to Language—Continued. (2) Three 1-hour lecture/discussions per week for eight weeks. Prerequisites: Placement in Subject A 25, 30, or 1S is determined by essay examination. Subject A 35A, 35B, and 35C are elective courses. Auditors are not permitted.

Lower Division Courses

1S. Introduction to Language. (2) Two 1-hour lectures per week. Prerequisites: Placement by examination. Formerly Subject A 9. A two-semester introductory course in grammar, pronunciation, and functions of language. A grade of C or higher fulfills the Subject A requirement. Two units of baccalaureate credit but recognized as four units of workload in computing study list. (F,SP) Staff

25. English Grammar/Composition. (3) Three 2-hour lectures per week. Prerequisites: Placement by examination. Formerly Subject A 20. An accelerated intermediate writing course for non-native speakers of English designed to improve the ability to write sentences, paragraphs, and essays. Three units of baccalaureate credit but recognized as six units of workload in computing study list. (F,SP) Staff

30. English Composition. (2) Two units of baccalaureate credit, but counted as four workload units on the study list. Two 2-hour lecture/discussions and one 1-hour tutorial per week. Prerequisites: Placement by examination. A course for non-native speakers of English—designed to develop proficiency in expository writing preparatory to work in Subject A 1S. (F,SP) Staff

35A. Oral Communication. Two 1½-hour lecture/discussion classes per week. Recognized as two workload units in computing the study list. Work on oral communication skills used in academic settings. (F,SP) Staff

35B. Oral Communication. Two 1½-hour lecture/discussion classes per week. Prerequisites: 35A. Recognized as two workload units in computing the study list. Work on oral communication skills used in academic settings. (F,SP) Staff

35C. Oral Communication. Course may be repeated for credit. Two 1½-hour lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: GSI appointment. Recognized as two workload units in computing the study list. For GSIs whose native language is not English. Work on communication and grammar, discussion of the culture of the American classroom, and videotaped teaching practice.

Interdepartmental Studies Courses

Upper Division Course

IDS 140. Technical Communication for Non-Native Speakers of English. (3) Two 1½-hour lectures 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; Subject A and the College of Engineering. (F,SP)

Undergraduate and Interdisciplinary Studies

(College of Letters and Science)

Division Office: 301 Campbell Hall, 642-0108
Divisional Dean: Donald A. McGurk, Ph.D.

The mission of the Division of Undergraduate and Interdisciplinary Studies 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 the Division of Undergraduate and Interdisciplinary Studies administers the following majors.

For a complete description of the major programs and courses, please see the entries listed alphabetically by major.

Field Majors

Humanities. The humanities field major is closed to new students. Students interested in discussing individual areas of concentration drawn from a range of disciplines in the social sciences including history, economics, psychology, political science, and many others.

Group Majors

Celtic Studies. This is an interdisciplinary program focusing on the culture, languages, literature, and history of the Celtic regions, including Ireland, Wales, and sometimes England. Faculty from the departments of English, Rhetoric, Linguistics, and German will participate in teaching the courses. A Celtic studies minor is also available.

Cognitive Science. A group major in cognitive science has been approved by the College of Letters and Science for 1991-92. However, the California Postsecondary Education Commission, which reviews all new major programs, had not made its final determination regarding the group major by press time for this catalog. Cognitive science is the cross-disciplinary study of the structure and processes of human cognition and their computational simulation or modeling.

Environmental Science. This major is for students who want an understanding of the impact of science and technology on society and who wish to contribute to the solution of environmental problems.

Film. This major has been designed to place the history and theory of film in the larger context of humanistic studies.

Mass Communications. The major applies a range of disciplines in the social sciences and humanities to the understanding of contemporary mass media and their structure, history, content, consequences, and policy implications.

Religious Studies. The major provides opportunities for securing a broad background in the liberal arts while at the same time allowing for a focus on a thematic concern or a particular religious tradition. The major views religion from a global perspective and combines aspects of the humanities and social science. A religious studies minor is also available.

Women's Studies. The major offers students the opportunity to focus their course of study on women and gender, drawing together insights, methods, and theories from a variety of disciplines in the humanities and social sciences. A women's studies minor is also available.

In addition to the majors listed above, the Division of Undergraduate and Interdisciplinary Studies has developed innovative introductory courses as Topics in Western Civilization, The Development of World Civilization, and the Undergraduate Colloquium.

These courses are administered by Freshman and Sophomore Studies (Division of Undergraduate and Interdisciplinary Studies, 325 and 327 Campbell Hall, 642-3853) and are now entitle Freshman and Sophomore Studies 44A, 44B, 44C, 44D, and 79 and UGIS 55A-55B.

Lower Division Courses

55A. The Development of World Civilization. (4) Three hours of lecture and two hours of discussion per week. Formerly Special Programs 55A. The making of the major societies and cultures of the world. A comparative 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. (F) Staff

55B. The Development of World Civilization. (4) Three hours of lecture and two hours of discussion per week. Formerly Special Programs 55B. An introduction to the major cultures of the world, on a broad comparative basis, since 1500 CE. Emphasis focuses on the process whereby the major parts of the world have become increasingly connected economically and politically and how the various peoples have evolved, voluntarily or involuntarily, through this experience. (SP) Staff

98. Undergraduate and Interdisciplinary Studies. (1) Course may be repeated as topic changes. One 1-hour seminar per week. Must be taken on a passed/not passed basis. Seminar for the group study of selected topics, which will vary from semester to semester. (F,SP)

98X. Directed Group Study with UGIS 55. (1) One hour of directed group study per week. Must be taken on a passed/not passed basis. Formerly Special Programs 55X. Only for students majoring in UGIS 55 or UGIS 55B. An extra weekly session emphasizing writing and speaking skills. (F,SP) Staff

Upper Division Courses

179. Undergraduate Colloquium 179. (1) The course may be repeated for credit. One 1½-hour lecture per week. Must be taken on a passed/not passed basis. Formerly Special Programs 179. Undergraduate Colloquium. Topics change each semester. Check with department office, 301 Campbell Hall, for current topic. (F,SP) Staff

191. Seminar: Critical Approaches to Works of Art. (4) Three hours of seminar per week. Prerequisites: (Preparation to be determined by interview). A cross-disciplinary seminar devoted to the interpretation of Bay Area examples in all of the visual arts. Written exercises and class discussions of comparative analysis, beginning with older work, where objective stan-
Women's Studies
(University of California, Berkeley)

Women's Studies Office: 301 Campbell Hall, 642-2626, 642-2767
Director: Irene Tinker, Ph.D.; Academic Coordinator: Ellen Lewin

Professors:
- Evelyn Nakano Glenn, Ph.D. (Women's Studies, Asian Studies), Women, work, the family, race, ethnicity, and gender in the 20th century
- June Jordan (Euro-American Studies), Poetry, creative writing, women and literature
- Evelyn Fox Keller, Ph.D. (Rhetoric), History, philosophy, sociology of science; gender and science

Affiliated Faculty:
- Mary P. Ryan, Ph.D. (History); History of American women, 18th- and 20th-century U.S. social and cultural history
- Carol Stack, Ph.D. (Anthropology and Education); Faculty Affiliate
- Irene Tinker, Ph.D. (City and Regional Planning); Women and international development, policy studies

Chancellor's Distinguished Professor:
- Trinh Minh-Ha, Ph.D. (Women's Studies); Feminist film theory

Lecturer:
- Ellen Lewin, Ph.D. (Anthropology); Cross-cultural perspectives on women, gender, and sex roles; medical and urban anthropology

Affiliated Faculty:
- More than 70 faculty members throughout the University are affiliated with Women's Studies. For details, see the Women's Studies website and a list of course offerings on women and gender prepared each semester. Affiliated faculty teaching with the program in 1991-92 include: Ellen Lewin, Ph.D. (Anthropology); Nancy Schepal-Hughes, Ph.D. (Anthropology)

Group Major in Women's Studies

The Berkeley Women's Studies Program was founded in 1976 to enhance the existing curriculum by introducing the subject of women into serious academic inquiry. Women's Studies seeks to describe the experience of women throughout history, across the world, and from different economic, ethnic, and racial groups. It engages the question of gender itself. Although all societies make gender distinctions, there is no agreement on how male and female evolve, how are they perpetuated, and how might they be redefined? Women's Studies examines the sexual inequality and conflict created by gender roles and the transformation of these roles in today's society.

As we expand the content of the traditional curriculum, we re-evaluate its methods and models as they succeed or fail to account for the experience of women. We have adapted the ideas and research methods of several academic disciplines and produced our own body of feminist theory and scholarship on women. By analyzing the powerful and problematic impact of gender differences, Women's Studies revises and enlarges our understanding of ourselves and our world.

The Women's Studies Program offers students the opportunity to study women and gender through an interdisciplinary curriculum taught by the program's own staff and members of other departments. Students learn to apply the methods and theories of sociologists, historians, literary critics, philosophers of science, etc., to the study of women. They explore a growing body of feminist theory that redefines our understanding of gender, society, and culture. After graduation, Women's Studies students work in a variety of fields, including law, medicine, and business; take advanced degrees in Women's Studies, the humanities, and social sciences; and pursue careers in health, counseling, teaching, government, business, and community work.

Major Program

Note: The following requirements apply to students who declare the major in fall 1990 and thereafter. Students already in the major may complete it under the former regulations, copies of which may be obtained from the Division of Undergraduate and Interdisciplinary Studies, 301 Campbell Hall.

Prerequisites:
To declare the Women's Studies major, students must have completed two lower division courses in Women's Studies. Students may choose from Women's Studies lower division courses (WS10, 20, 30, 40) or from lower division courses on women and gender offered by other departments, e.g., Comparative Literature 40; Women and Literature, French 41; Women's Voices in French Literature; Psychology 14: Psychology of Gender, etc. At the time of declaration, students will normally choose a major adviser from the Women's Studies faculty.

Upper Division Requirements: The requirements for a Women's Studies major consist of a minimum of 30 and a maximum of 36 units as follows:

Core courses (16 units): 101, Cultural Representations of Gender; 102, Comparative Gender Systems; 103, Race, Ethnicity, and Gender; 104, Advanced Feminist Theory.

Disciplinary Concentration: Disciplinary Concentration is required of all Women's Studies majors. Students choose a course in one academic discipline as defined by existing departments or programs at Berkeley and approved by a faculty adviser. Departments such as Comparative Literature, Anthropology, City and Regional Planning, Comparative Literature, English, Ethnic Studies, History, Public Health, Public Policy, Rhetoric, and Sociology, among others, have course offerings that are appropriate disciplinary concentrations. Theory and methods courses as well as classes on women and gender per se fulfill this requirement. Relevant Women's Studies courses are also appropriate depending on the discipline of the instructor. The disciplinary concentration will determine whether the student's major is a humanities or a social science emphasis.

Essay Requirement: All majors are required to write at least one extended paper in which they apply their Women's Studies knowledge and training to researching a topic of their choice. Upper division Women's Studies courses, and especially Women's Studies courses in one academic discipline, are the preferred rubric for meeting this requirement. With the adviser's approval, however, it may be fulfilled outside the Women's Studies Program. The essay should be 20-25 pages in length and entail original research. It must be approved by a Women's Studies faculty adviser and be filed with the Women's Studies office before graduation.

Electives: The remainder of the 30-unit requirement may be fulfilled by Women's Studies courses or courses offered by other departments and listed in "Courses on Women and Gender," published each semester by the Women's Studies Program.

Breakage Requirements: Majors must take at least one Women's Studies-related course, the subject matter of which predate 1900, and at least one course which considers gender outside the United States. The breadth requirement may be met by any of the courses in both the major or the group requirements or prerequisites. The breadth requirement may be met by any of the courses in both the major or the group requirements or prerequisites.

Honors Program: Students must have a 3.3 for honors, a 3.5 for high honors, and a 3.7 for highest honors. In any case, the senior thesis must be deemed excellent.

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 one lower division Women's Studies course. Minors in Women's Studies complete five lower division courses as follows: WS 101, 201, 202, 398, and two electives (chosen from upper division Women's Studies courses or courses offered by other departments and listed in "Courses on Women and Gender," published each semester by the Women's Studies Program).

Lower Division Courses

1A. Freshman Composition. (4) Three hours of lecture plus one hour of discussion per week. Prerequisites: Subject A. Introduction to composition, and English 1A. The assignment will focus on themes and issues in Women's Studies. (SP, Staff)

10. Introduction to Women's Studies. (3) Three hours of lecture and discussion per week. Introduction to Women's Studies as an academic discipline and to the feminist critique of existing disciplines through an examination of several selected areas, such as sex role socialization, the women's movements, and female art. (F,SP Staff)

14. Contemporary Global Issues for Women. (4) Three hours of lecture and discussion per week. An introduction to feminist theory from the classics of the 18th and 19th century, to the 2nd Wave feminist theorists of the 1970s, and to the feminist critique of the existing disciplines through an examination of several selected areas, such as sex role socialization, the women's movements, and female art. (F,SP Staff)

20. Introduction to Feminist Theory. (3) Three hours of lecture and discussion per week. An introduction to Feminist Theory from the classics of the 18th and 19th century, the 2nd Wave feminist theorists of the 1970s, and to the feminist critique of the existing disciplines through an examination of several selected areas, such as sex role socialization, the women's movements, and female art. (F,SP Staff)

20W. Writing intensive Workshop—Feminist Theory. (5) Three hours of seminar and 2 hours of section per week. Prerequisites: Participation in Women's Division. This course is only open to students who have not completed the second half of the reading and composition requirement. This course is identical to WS 20 above on a quarter by quarter basis. The focus will be on writing assignments. Fulfills second half of reading and composition requirement. (F, Staff)

30. First Year Seminar in Women's Studies. (3) Three hours of seminar per week. Prerequisites: Participation in Women's Division. An introduction to feminist studies through the examination of a single problem area. Topics vary; examples include women in the city, the concept of female culture, women and work. (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 year to year. Any of the courses in both the major or the group requirements or prerequisites. The breadth requirement may be met by any of the courses in both the major or the group requirements or prerequisites. (F,SP Staff)

98. Directed Group Study for Undergraduates. (1-4) Course may be repeated for credit. Must be taken on a pass/no pass basis. The adviser will provide the student with a study of selected topics not covered by regularly scheduled courses. Topics will vary from year to year. (F,SP Staff)

Upper Division Courses

101. Cultural Representations of Gender. (4) Three hours of lecture and discussion per week. The goal of Women's Studies 101 is to introduce fundamental critical terms and models for understanding both how gender is constructed and communicated through cultural representations, and how gender can simultaneously serve to construct, to varying degrees, the forms cultural
102. Comparative Gender Systems. (3) Three hours of lecture and discussion per week. The object of this course is to illustrate, through comparative case studies, the systematic but variable ways gender structures social life. It deals with issues of asymmetry, hierarchy and inequality between men and women and analyzes the social bases of gender organization and its fundamental effect on social systems as a whole. (F,SP) Staff

103. Race, Ethnicity, and Gender. (4) Three hours of lecture and discussion per week. Formerly Women's Studies 125. This course will examine the response of feminism (as an ideology and as a social movement) to the differences and commonalities of all women, the differences of race, ethnicity and class, and the commonalities which all women share by virtue of womanhood. The reading will be multi-disciplinary. From a social historical perspective, the course will examine selected issues and changes concerning race, gender, and class. (F,SP) Staff

104. Advanced Feminist Theory. (4) Four hours of lecture and discussion per week. Formerly Women's Studies 110. A course in 20th century feminist theory, focusing on interdisciplinary theories of women, gender and sexuality in relation to race, class, and culture. (F,SP) Staff

111. Special Topic Seminars. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Priority given to Women's Studies majors. Formerly 100. This seminar 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 is on student discussion and collaboration. Original research and extended written work will be required. Also listed as IDS 111 and Middle Eastern Studies 111. (F,SP) Staff

112. Feminist Literary Theory. (4) Two 1½-hour seminars per week. Prerequisites: Priority given to Women's Studies majors. Formerly Women's Studies 101. The course is designed to cover literary texts (formalist, affective, generic, psychoanalytic, Marxist, structuralist) and to investigate different aspects of feminist criticism in relation to these approaches.

113. Feminist Perspectives in Social Science. (4) Three hours of seminar and discussion per week. Prerequisites: Priority given to Women's Studies majors. Formerly Women's Studies 102. A course in basic social science method (e.g., participant observation, content analysis) and the relationship of these methods to a feminist perspective in social science.

120. The History of American Women. (3) Three hours of lecture/discussion per week. Prerequisites: Upper division standing or consent of instructor. Survey of the major themes and events in the history of women from colonial settlement to the present time; how women have been affected by changes in family structure, sexual roles, employment patterns, legal and educational opportunities, etc.

122. Women in the University: Gender and Higher Education. (3) Three hours of lecture and discussion per week. The situations and experiences of women in higher education in the United States, employing both historical perspectives and data covering the contemporary scene. A prior knowledge of the history of American education is not presumed.

131. Gender and Science. (3) Three 1-hour lectures with discussion per week. What role has science as a social institution played in the sexual division of intellectual and emotional labor underling our cultural history? What consequences has the division of labor had for scientific practice? In what ways has the historical exclusion of traditionally female interests affected the development of the natural sciences? What differences if any would the full and equal participation of women make?

136. Woman as Immigrant. (3) Two 1½ hours lecture per week. Prerequisites: Upper division standing and consent of instructor. Examine patterns of women's immigration of the U.S. in specific socio-historical and cultural contexts. Special attention to race, ethnic and identity issues from woman-centered analysis and methodology. Also listed as Ethnic Studies 136 and IDS 136. (SP)

141. Women and World Development. (3) Three hours lecture with discussion 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 microentrepreneurs, and the effect of the women's movement to change both the theory and practice of development. (F) Tinker

153A. Images of Black Women in Literature: Slavery to the 20th Century. (3) Three hours lecture and one hour discussion per week. Prerequisites: Reading and composition requirement. Analysis of the cultural, literary and social assumptions that contribute to the various images of the Black women in Western literature and Black American writing. Course explores the literature of 19th century Afro-American, an exploding field in literary American discourse. Also listed as Afro-American Studies 153A and IDS 153A. (F,SP)

153B. Contemporary Images of Black 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 Black woman in contemporary Western Black American writings. Also listed as Afro-American Studies 153B and IDS 153B. (SP)

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 work and 3.0 GPA of courses in the major. Entails writing a bachelor's honors thesis relating to the student's major in Women's Studies. Each student will work under the guidance of a faculty advisor who will read and grade the thesis. (F,SP) Staff

197. Women as Advocates. (3) Course may be repeated for credit. Two hours seminar and ten hours internship per week. Must be taken on a passed/not passed basis. Prerequisites: Preference given to Women's Studies majors. Analysis of the history and causes of societal problems which affect women adversely and of the variety of advocacy groups which have organized to address these problems. Internships will be with both activist and service organizations; students will participate as entry level staff members while preparing dossier on the organization for seminar presentation. A final student report will summarize the history and growth of the organization. (F,SP) Staff

198. Directed Group Study for Advanced Undergraduates. (1-4) May be repeated for credit. 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

199. Supervised Independent Study for Advanced Undergraduates. (1-4) May be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Women's Studies major. Reading and confer- ence 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

291B. Genes, Embryos, and Shifting Maps of Personhood. (4) Two and one half hours lecture and one hour seminar per week. Prerequisites: Graduate student. Students will investigate a broad range of reflective issues in which emerging technologies force people to articulate and map new meanings of personhood, parenthood, rights, and responsibilities. Sponsoring Departments: Rhetoric, Women's Studies, and Jurisprudence and Social Policy.

Wood Science and Technology

(College of Natural Resources, Interdisciplinary Graduate Groups)

Building 476 Richmond Field Station, 231-9456

Professors:
- Frank C. Beal, Ph.D. (Forestry and Resource Management, Forest Products Laboratory)
- David A. Donofrio, Ph.D. (Mechanical Engineering)
- Wayne Wilcox, Ph.D. (Forestry and Resource Management, Forest Products Laboratory)
- Robert B. Williamson, Ph.D. (Civil Engineering, Forest Products Laboratory)

Associate Professor:
- Richard S. Dodd, Ph.D. (Forestry and Resource Management, Forest Products Laboratory)

Assistant Professor:
- Stephen L. Quares, Ph.D. (Forestry and Resource Management, Forest Products Laboratory)

Wood Science and Technology courses appear in this catalog under the heading Forest Products.

Zoology

(College of Letters and Science)

The biological sciences at Berkeley were reorganized in July 1989. Consult staff in the Department of Integrative Biology and the Department of Molecular and Cell Biology for information on undergraduate and graduate programs in zoology. Undergraduate students who declared the zoology major before fall 1989 may continue in the program. For a listing of courses, see the catalog in the Forest Products. Undergraduate students who declared the zoology major may be admitted to the program provided they complete all degree requirements and graduate before fall semester 1993.
Appendix and Index
Criteria Used in Selecting Freshmen

Freshman applicants to Berkeley apply for admission to one of five colleges: Chemistry, Engineering, Environmental Design, Letters and Science, and Natural Resources. The number of spaces for new students is limited and varies by college in response to the demand and competition for admission. For example, the College of Engineering may have no more than 1,000 admission spaces for new freshmen, yet typically nearly 3,000 students apply each fall. The College of Letters and Science has about 6,000 admission spaces for new freshmen, with typically more than 15,000 applications. Since Berkeley receives applications from so many more eligible students than there are spaces available, the qualifications of the applicant who are selected for admission generally far exceed the minimum eligibility requirements explained on pages 26-28.

For the fall term, the five undergraduate colleges at Berkeley expect to receive a total of about 20,000 freshman applications. Of these, we will admit approximately 1,800, which will result in a fall freshman class of about 3,300 students. The procedures for selecting students have been developed under the guidance of University of California Regents’ policy and Berkeley Academic Senate recommendations. The colleges of Letters and Science and Natural Resources follow these procedures closely. The colleges of Chemistry, Engineering, and Environmental Design modify them.

When reviewing applicants for admission, we ask these questions: What have they accomplished academically? How have they contributed to the campus’s social and cultural life? What have they made of their individual opportunities? How will they contribute to the campus’s social and cultural life?

For the colleges of Letters and Science and Natural Resources, we select applicants in three groups:

Group 1: We rank all eligible applicants using an academic index score (AIS) derived from their grades and test scores. Fifty percent of total admissions is selected based on this ranking.

Group 2: To select the students for Group 2, we review several hundred applicants who just missed the cut-off for Group 1. This group is also chosen strictly on the basis of AIS ranking. Because we consider differences in grades and test scores, we cannot make meaningful distinctions based on the AIS alone. Therefore, we read the entire file of each student, looking primarily for other evidence of intellectual ability and accomplishment as indicated by the essay, advanced courses taken, and academic activities and honors. We also consider significant commitments to work and community service. The students admitted in Group 2 make up about six percent of the total freshman admissions.

Groups 1 and 2 together mean that approximately 56 percent of our admits are based entirely or almost entirely on academic criteria; Regents’ policy has established a range of 40 percent to 60 percent for admission based on academic criteria alone.

Group 3: In this group, we evaluate applicants by reviewing grades and test scores. For example, we review other academic accomplishments and extracurricular activities and take into account personal circumstances that might justify special consideration. To build a freshman class that embraces a wide range of individual talents and is rich in cultural, socio-economic, geographic, and racial diversity, we pay particular attention to the following factors:

- Location of residence;
- Special talents, interests, or experiences other than the academic criteria that demonstrate unusual potential for leadership, achievement, and service in a particular field such as civic life, the arts, or athletics;
- Special circumstances affecting applicants’ life experiences. These circumstances may include disabilities, hardship, low family income, veteran status, education at a rural or extraordinary high school, belonging to a group designated for affirmative action, and being an applicant over the age of 25.

All of the students admitted in Groups 1, 2, and 3 have completed the required courses and achieved the grades and test scores that make them UC-eligible. A very limited number of students who do not meet minimum eligibility requirements may be admitted by exception. In most cases, these students have technical deficiencies that are offset by strengths in other areas. Admissions by exception may not exceed five percent of total freshman admissions.

Like the colleges of Letters and Science and Natural Resources, the colleges of Engineering and Environmental Design fill 50 percent of their places by ranking eligible applicants by AIS. The College of Chemistry admits 60 percent of its class in this way.

Students are selected for the remaining spaces in the colleges of Chemistry, Engineering, and Environmental Design using the same criteria given for the colleges of Letters and Science and Natural Resources. In addition, consideration may be given for applicants’ interest in and knowledge of their intended major. Because the numbers of applicants are considerably smaller, faculty participate in the selection.

Criteria Used in Selecting Advanced-Standing Students

The Colleges of Chemistry, Engineering, Environmental Design, Letters and Science, and Natural Resources; the School of Optometry and the Walter A. Haas School of Business; and the Department of Ethnic Studies

Advanced standing students are those who have enrolled in a regular session at any college or university after high school graduation. The summer immediately following high school graduation is not regarded as a regular session.

Lower Division Advanced Standing (Freshmen and Sophomores). Generally there are very few openings for applicants who wish to transfer to Berkeley during the fall semester. Members of underrepresented minority groups, applicants with demonstrated hardships, and recruited athletes are considered for admission on a case-by-case basis.

Upper Division Advanced Standing (Juniors). Applicants who wish to transfer to Berkeley as juniors must have completed 56 transferable semester units of college credit (60 units for the major in business administration).

Applicants who were eligible for admission to the University after high school must have a minimum grade-point average of 2.0 in college courses; applicants who were not eligible after high school must have a minimum grade-point average of 2.4 in college courses; and applicants who are not residents of California must have a minimum grade-point average of 2.8 in college courses.

In recent years, almost every major offered at Berkeley has become competitive. Admission to some majors—business administration, all engineering majors, journalism, economics, and political science, for example—is exceptionally competitive for transfer students. Because there are so many more qualified applicants than there are spaces available, applicants accepted to these programs should have very strong academic records and should have completed the lower division prerequisite courses for the intended major. Transfer students are accepted from both two-year and four-year institutions. Preference is given to applicants who are attending a California community college or are residents of California, and to members of underrepresented minority groups (blacks, Chicanos, Latinos, and Native Americans).

Applicants to all schools and colleges will be selected primarily for strength of academic preparation, completion of prerequisites for the major, completion of breadth requirements, a minimum grade-point average, and, on a less weighted basis, for other factors such as motivation, extracurricular achievement, or demonstrated hardships as reflected in the applicant essay.

Applicants to any major in the College of Letters and Science must have completed breadth requirements in reading and composition, foreign language, and quantitative reasoning or the transfer core curriculum.

Personalized System of Instruction

A number of self-paced courses, also known as Keller Plan or PSI (Personalized System of Instruction) courses, are currently offered at Berkeley. If you do not need the motivation imparted by deadlines, or if you are likely to profit from these courses. While each course is unique, they typically have the following characteristics:

1. Few lectures are given. You learn the material through study guides, workbooks, and textbooks. In some language courses, laboratory attendance may be required.

2. You work at your own pace within the limits of the semester.

3. You must demonstrate mastery of the material covered, usually through a quiz or an assignment, before proceeding to more advanced topics.

4. You meet periodically with your instructors or tutors to ask questions or discuss problems.

5. In some courses, variable amounts of credit may be granted. If you enroll in 2 units but complete 4, the instructor will in general increase the unit value on the grade sheet. If, however, you enroll in 4 units but complete only 2, 2 units of credit will be awarded, along with 2 units of F for the uncompeted work. You should enroll for as few units as possible.

This method of instruction is most popular in introductory language and science courses. The following courses are currently taught in this format: Computer Science 93, 9A, 9B, 9C.
Professional Development Program

Program Office: 2308 Stephens Hall, 642-5881

The Professional Development Program (PDP) is an honors program designed to increase the access of gifted minority and women students to higher education, especially in the fields of science, mathematics, business, and engineering, where they are particularly under-represented. PDP serves gifted secondary school minority and women students as well as Berkeley undergraduate and graduate students. High school students with outstanding academic ability are brought to the Berkeley campus, given intensive preparation for university study, and motivated to seek professional careers. Instruction is provided in diverse academic disciplines, counseling and advising are offered, and field trips, guest lectures, theatrical events, and workshops aid pre-college students in defining their career goals.

PDP offers Berkeley undergraduate students special academic assistance and counseling and the opportunity to participate in faculty-supervised laboratory research in a broad range of academic disciplines. The program for undergraduate students maximizes access to the wealth of educational resources at Berkeley through individual faculty advising and curriculum planning in the student's major; workshops in calculus, seminars, and tutorials which augment regular course offerings; laboratory and field placement opportunities as training for research; peer teaching and research assistantships. Students who are about to begin graduate study are also provided with intensive instruction designed to acquaint them with the methodology of graduate work in their disciplines. PDP provides graduate students with individualized orientation workshops, seminars, and lectures by distinguished minority and women scholars. PDP helps students to locate jobs that will advance their professional careers. For further information, please contact the program office or call 642-5881.

University Research Expeditions Program

Program Office: 2223 Fulton Street, Room 303, 642-6586

The University Research Expeditions Program (UREP) was established on the Berkeley campus to help provide funds for field research in the natural and social sciences while simultaneously offering students, staff, and members of the public the opportunity of joining domestic and foreign field research projects sponsored by the University. Through UREP, University scientists manage research projects involving techniques that can be learned with minimal training are brought together with individuals interested in actively participating in field work. Participants become short-term members of a field research team and assist in wildlife habitat studies, botanical collecting expeditions, ethnographic field work, ecological surveys, fossil excavations, historical studies, and other types of field research.

UREP projects are open to students, staff, and members of the general public. No previous academic or field experience is necessary to participate; instruction in field techniques, is provided after participants arrive at their research site. Participants are selected for their interests, skills, experience, and willingness to work and learn. A tax-deductible donation to the University is required to help subsidize the research costs of the projects. Partial scholarships are available to students.

Past UREP projects have included animal behavior observations in Kenya, Argentina, and Australia; archaeological excavations in Italy, California, and Latin America; a museum collecting expedition to the Rendille, a nomadic tribe in Northern Kenya; an anthropological study of Carnival in Brazil; preparation of an archaeological map of the Valley of the Kings, Egypt; marine studies in Hawaii, Jamaica, and Fiji; and ecological studies in Costa Rica, Ecuador, Mexico, Kenya, New Caledonia, and Surinam.

Some of the projects planned for 1991-92, each approximately two to three weeks in duration, are marine biology studies in French Polynesia and Baja, animal behavior studies in Kenya and Peruvian; criminological detective work in New Mexico and China; and bird behavior studies in the Klamath Basin. Other projects in ecology, biology, botany, anthropology, paleontology, and archaeology will be conducted in Portugal, Belits, the Galapagos Islands, and Ecuador.

For further information, please contact the University Research Expeditions Program; University of California at Berkeley; Berkeley, CA 94720; telephone 642-6586.

California Residency and the Nonresident Tuition Fee

If you have not been a resident of California for more than one year immediately before the residence determination date for each term in which you propose to attend the University, you must pay a nonresident fee in addition to all other fees. The residence determination date is the day instruction begins for the semester.

General

If you are a minor student and want to be classified as a resident for tuition purposes, the time of admission you must have established residence in California for more than one year immediately preceding the residence determination date for which you propose to attend the University, and you must have met all residence requirements for your age. You must also present objective evidence that you intend to make California your permanent home. If these steps are delayed, the one-year durational requirement will be extended until both presence and intent have been demonstrated for one full year.

Physical presence within the state solely for educational purposes does not constitute the establishment of domicile in California. The rules outlined above do not apply to adult aliens in the U.S. on nonimmigrant statuses that preclude them from establishing domicile in the U.S. as your permanent address on all school and employment records, including military records; obtaining a California driver's license or California identification card, if a non-driver; obtaining California vehicle registration; paying California income taxes as a resident, including income earned outside California from the date residence was established; establishing a residence where your permanent belongings are kept within California; licensing for professional practice in California; and the absence of these indications in other states during an period for which you claim residence in California. Documentation may be required. No single factor is controlling or decisive; all relevant indications will be considered.

If you are an unmarried minor (under age 18), the residence of the parent with whom you live is considered your residence. If you live with neither parent, your residence is that of the parent with whom you last lived. You may establish your own residence if both your parents are deceased and a legal guardian has not been appointed. If you are an unmarried minor and have a parent living in California, residence cannot be changed by your own actions, by the appointment of a legal guardian, or by relinquishment of a parent's right of control. The California residence of the parent from whom you live is considered your California residence must satisfy the one-year durational requirement. The rules outlined above do not apply to minor aliens in the U.S. on nonimmigrant statuses that preclude them from establishing domicile in the U.S.

Husbands and wives each establish their own residence; neither derives residence from the other.

Exceptions

1. If you are a minor U.S. citizen or eligible alien whose parents lived in California for at least one year and then, within one year of the residence determination date, left to establish residency in another state, you are entitled to resident status as long as you remain in California for at least a year after you reach age 18 and are continuously enrolled at an educational institution. This exception continues until you have reached the age of 18 and have resided in the state long enough to become a resident adult or adults who were not your parents but who were responsible for your care and control, you are entitled to resident status.

2. If you are a U.S. citizen or eligible alien and either a minor or aged 18 and can prove that you lived in California for the entire year before the residence determination date, that you were self-supporting for that year, and that you intend to make California your permanent home, you may be eligible for resident status.

3. If you are a minor U.S. citizen or eligible alien and lived continuously for at least two years before the residence determination date with a resident parent or parents who were not your parents but who were responsible for your care and control, you are entitled to resident status. This exception continues until you have reached the age of 18 and have resided in the state long enough to become a resident adult, so long as you continuously attend an educational institution.

4. Resident status is available to you if you are the natural or adopted child, stepchild, or dependent spouse of a member of the U.S. military stationed in California on active duty. You must reside in California for one year while you are continuously attending an educational institution.

5. Resident status is available to you if you are the natural or adopted child, stepchild, or dependent spouse of a member of the U.S. military stationed in California on active duty. You must reside in California for one year while you are continuously attending an educational institution.

6. Resident status is available to you if you are the natural or adopted child, stepchild, or dependent spouse of a member of the U.S. military stationed in California on active duty. You must reside in California for one year while you are continuously attending an educational institution.
5. If you are a member of the U.S. military stationed in California on active duty, unless you are assigned for educational purposes to a state-supported institution of higher education, you are entitled to resident classification until you have lived in California long enough to become a resident.

6. If you are the child of a resident deceased public law enforcement or fire suppression employee who was killed in the course of duty, you may be entitled to resident classification.

7. If you are the spouse or dependent child of a University of California employee whose permanent assignment is outside California, you may be entitled to resident classification.

8. If you have not been an adult resident of California for more than one year and you are a dependent child of a California resident parent who has been a resident for more than one year immediately before the residence determination date, you may be entitled to a waiver of the nonresident tuition fee until you have resided in California for the minimum time necessary to become a resident so long as you continuously attend a public educational institution.

**Reclassification**

If you are a continuing student who is classified as a nonresident for tuition purposes and believe that you will be eligible for resident status next term, you must petition to the Office of Admissions and Records and interview to have your resident status changed before submitting your registration fee payment. You must initiate all changes of status before the last registration period of the semester for which you want to be reclassified. In addition to the indications of residency listed above, California law requires that financial independence be included among the factors considered if your parents live outside California. Financial independence will not be considered if you are a graduate student instructor or research assistant employed on a 0.49 or more time basis for the term for which you seek reclassification. For detailed information regarding reclassification, contact the residence deputy.

**Procedures**

New and returning students are required to complete a Statement of Legal Residence. Your status is determined by the residence deputy, who is located in the Office of the Registrar.

We caution you that this summary is not a complete explanation of the law regarding residence. You should also note that changes may have been made in the rate of nonresident tuition and in the residence requirements since this catalog was published. Regulations adopted by the Regents are available for inspection in the Office of the Registrar.

If you are classified incorrectly as a resident, you are subject to reclassification and to payment of all nonresident fees. If you conceal facts or furnish false ones in order to be classified as a resident, you are also subject to University discipline. Resident students who become nonresidents must immediately notify the residence deputy.

Inquiries from prospective students regarding reclassification for tuition purposes should be directed to the Residence Deputy, 120 Sproul Hall, University of California, Berkeley; Berkeley, CA 94720. No other campus personnel are authorized to supply information about residence requirements for tuition purposes. Following a final decision on residence classification by the residence deputy, you may appeal in writing to the Legal Analyst—Residence Matters, 300 Lakeside Drive, Seventh Floor, Oakland, CA 94612-3565, within 90 days after the residence deputy notifies you of the final decision.

**Waivers of Nonresident Tuition**

To the extent funds are available, nonresident tuition scholarships may be granted to spouses and dependent, unmarried children under age 21 of a University faculty member who is a member of the Academic Senate, and to certain foreign students. Inquiries regarding these waivers should be directed to the residence deputy.

Nonresident graduate students with outstanding academic records may be recommended by departments for a nonresident tuition scholarship. Awards may cover full academic year or partial nonresident tuition. Applications are available from the Graduate Fellowship Office and departments. Completed applications should be submitted to departments by April 15.

**Organized Research Units**

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Average Monthly Salary of Graduates</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Bachelor's</td>
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<tr>
<td>Accounting</td>
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<tr>
<td>Bus. Admin. (General)</td>
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<tr>
<td>Biological Sciences</td>
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<td>Physical and Earth Sciences</td>
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<tr>
<td>Other Social Sciences</td>
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*Source: A July 1990 national survey of representative groups of colleges conducted by the College Placement Council representing the 80 percent range of offers throughout the country. It should be noted that a wide variation in starting salaries exists within each discipline based on job location, type of employer, personal qualifications of the individual, and employment conditions at the time of job entry. Recipients of Berkeley degrees are often more in demand than degree earners from representative colleges across the nation.*
Officers of Administration

The Regents of the University of California

Regents Ex Officio

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Lieutenant Governor of California
Leo T. McCarthy
Speaker of the Assembly
Willie L. Brown, Jr.
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Walter E. Hoadley
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