Policies and Requirements Addendum—Version History

- Exercise Biology
- Medieval and Early Modern Studies

- Biological Sciences
- Chemistry
- Communication
- Engineering, Chemical Engineering and Materials Science
- Engineering, Mechanical and Aerospace Engineering
- Human Development
- Managerial Economics
- Mathematics
- Medieval and Early Modern Studies
- Sociology
- Wildlife, Fish, and Conservation Biology

General Catalog Update: 6.19.2013
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- Engineering, Biological and Agricultural
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- Engineering, Civil and Environmental
- Engineering, Computer Science
- Engineering, Electrical and Computer Engineering
- Engineering, Mechanical and Aerospace Engineering
- Entomology and Nematology
- Environmental Policy Analysis and Planning
- Exercise Biology
- Letters and Science, College of Mathematics
- Microbiology and Molecular Genetics
- Music
- Neurobiology, Physiology, and Behavior
- Physics

Version 1.2: Final; 9.23.2013
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- Neurobiology, Physiology, and Behavior
- Repeating Courses
- Statistics
- Wildlife, Fish, and Conservation Biology
The 2012-2014 UC Davis General Catalog Supplement contains updated information regarding requirements and courses for the 2012-2014 academic years. Use this document in conjunction with the 2012-2014 UC Davis General Catalog. If a department is not listed in this document, there are no changes to that department's programs.
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Introduction

The 2012-2014 General Catalog Course Supplement and Policies & Requirements Addendum addresses important changes to the UC Davis 2012-2014 General Catalog. Changes are contained in two sections; the Course Supplement and Policies & Requirements Addendum.

Additionally, the 2013 General Catalog Update combines all the changes from the Course Supplement and Policies & Requirements Addendum up to Summer 2013.

Course Supplement

Changes, cancellations, or the addition of new courses, are contained in the Course Supplement, below.

Policies and Requirements Addendum

Revised or the addition of new undergraduate/graduate/professional degree programs and requirements, and revised or the addition of new General Catalog policies or procedures are contained in the Policies & Requirements Addendum.

Course Supplement

African American and African Studies

New and changed courses in African American and African (AAS)

Lower Division

10. African-American Culture and Society (4)
Lecture—3 hours; discussion—1 hour. Critical examination of the historical, political, social, and economic factors that have affected the development and status of African-American people in contemporary society. GE credit: ArtHum | ACGH, AH, DD, SS, WE.—II. (II.) Harrison, Osumare
[change in existing course—eff. winter 13]

12. Introduction to African Studies (4)
Lecture/discussion—4 hours. Introduction to African Studies which will focus on the various disciplinary perspectives through which African society and culture are generally studied. A survey of methods, resources and conceptual tools for the study of Africa. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—II. (II.) Adebanwi, Adejunmobi
[change in existing course—eff. winter 13]

18. Introduction to Caribbean Studies (4)
Lecture—3 hours; discussion—1 hour. Introduction to the contemporary culture, peoples, politics, and societies of the Caribbean. Topics include movements of people, goods and ideas across the Atlantic world and creative productions within the Caribbean. GE credit: ArtHum or SocSci | AH or SS, WC.—II. (II.) Adebanwi, Adejunmobi
[change in existing course—eff. winter 13]

Upper Division

100. Survey of Ethnicity in the U.S. (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing or consent of instructor. Limited enrollment. Sociological and historical analysis of the experience, culture, and relations of and between groups considered racial and/or ethnic minorities in the United States. GE credit: ArtHum | ACGH, AH, DD.—II. (II.) Harrison, Osumare
[change in existing course—eff. winter 13]

107C. African Descent Communities and Culture in Europe and Asia (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. The study of the origin and development of African Descent communities and cultures in Europe and Asia. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC.—II. (II.) Ng'weno
[change in existing course—eff. winter 13]

111. Cultural Politics in Contemporary Africa (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing or course 12. Themes and style of new cultural forms in Africa as displayed in art, music, film and writing, especially in regard to blending of indigenous and foreign influences. Social and political forces shaping contemporary cultural expression. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC.—II. (II.) Ng’weno
[change in existing course—eff. winter 13]

123. Black Female Experience in Contemporary Society (4)
Lecture—4 hours. Prerequisite: upper division standing or consent of instructor. Black female social, intellectual, and psychological development. Black women’s contributions in history, literature, and social science; life experiences of Black women and philosophical underpinnings of the feminist movement. Offered in alternate years. GE credit: ArtHum or SocSci, Div | ACGH, DD, SS.—III. (III.) Acham
[change in existing course—eff. winter 13]

130. Education in the African-American Community (4)
Lecture—2 hours; discussion—1 hour; fieldwork—3 hours. Prerequisite: course 10 or course 100, completion of the subject A requirement. Examination of the history of the education of African Americans in the United States. Examination and critique of contemporary theories concerning the schooling of African Americans. Offered irregularly. (Former course 140.) GE credit: SocSci | DD, SS.—I. (I.) Turner
[change in existing course—eff. winter 13]

155A. African-American Dance and Culture in the United States, Brazil and the Caribbean (4)
Lecture/discussion—4 hours. Comparative study of the African American dance forms in the U.S.A., Brazil, Haiti, Cuba, Jamaica, Barbados, and Trinidad. Examination of ritual, folk, and popular dance forms and the socio/historical factors that have influenced these forms. (Same course as Dramatic Art 155A.) GE credit: ArtHum | AH, VL, WC.—II. (II.) Osumare
[change in existing course—eff. winter 13]

156. Language and Identity in Africa and the African Diaspora (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Political and social developments in 20th-century South Africa as illustrated by a range of South African writing. Response of different writers to race relations, impact of government policy on types and content of writing. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, DD, WC.—III. (III.) Adejunmobi
[change in existing course—eff. winter 13]

157. Literature and Society in South Africa (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Political and social developments in 20th-century South Africa as illustrated by a range of South African writing. Response of different writers to race relations, impact of government policy on types and content of writing. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, WC, WE.—II. (II.) Adejunmobi
[change in existing course—eff. winter 13]

Quarter Offered: II-Fall, II-Winter, III-Spring, IV-Summer; 2013-2014 offering in parentheses

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; Wrt—Writing Experience

Fall 2011 and on General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; Wrt—Writing Experience
173B. Black Documentary Practicum (4)  
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 175A and consent of instructor. Creation of documentary projects, with students working in production crews. Offered in alternate years. GE credit: ArtHum | AH, DD—II, III, Acham  
(change in existing course—eff. winter 13)

176. The Politics of Resources (4)  
Lecture/discussion—4 hours. Prerequisite: course 12 or 110. Limited enrollment. Examination of the way in which the processes of the extraction, purification and use of natural resources and the complex regimes of valuation and commodification they reproduce lead to cooperation and conflict in contemporary Africa and beyond. GE credit: SocSci | SS, WC.—III. (III.) Adebawni  
(change in existing course—eff. winter 13)

177. Politics of Life in Africa (4)  
Lecture/discussion—4 hours. Existing in capacities in the structures of state and society in Africa for people to live well. Topics include institutions and practices that define state and civil society encounters in Africa; democracy, ethnicity, economic crisis, religion, citizenship, etc. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS, WC.—II. (II.) Adebawni  
(change in existing course—eff. winter 13)

181. Hip Hop in Urban America (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing or consent of instructor. Must have Junior or Senior level standing. History, aesthetics, urban context, and economics of hip-hop in the US, and its globalization. Hip-hop as a political elements-rap, deejaying, breakdance, and aerobics-art-allow the examination of issues of race, ethnicity, and gender in youth culture and American society. GE credit: ArtHum | AH, DD, VL—III. (III.) Osuamere  
(change in existing course—eff. winter 13)

Agricultural and Resource Economics

New and changed courses in Agricultural and Resource Economics (ARE)

Lower Division

15. Economic Basis of the Agricultural Industry (4)  
Lecture—4 hours. Agriculture and man; the agricultural industry in Australia and world economies; production and supply, marketing and demand; agricultural land, capital and labor markets; economic analysis of agriculture in an urban and industrialized economy emphasizing Australia. Taught in Australia under the supervision of a UC Davis faculty member. Not open for credit to students who have completed course 1. GE credit: SocSci | SS, WC.  
(change in existing course—eff. winter 13)

18. Business Law (4)  
Lecture—4 hours. Prerequisite: sophomore standing. General principles of business law in the areas of contracts, business organization, real property, uniform commercial code, sales, commercial paper, employment relations, and creditor-debtor against a background of the history and functioning of our present legal system. GE credit: SocSci | SS—II, LI, I, II.  
(change in existing course—eff. winter 13)

98. Directed Group Study (1-5)  
Prerequisite: consent of instructor. Restricted to lower division students. (P/NP grading only) GE credit: SS.  
99. Special Study for Undergraduates (1-5)  
Prerequisite: consent of instructor. (P/NP grading only) GE credit: SS.  
(change in existing course—eff. winter 13)

Upper Division

100A. Intermediate Microeconomics: Theory of Production and Consumption (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A, 1B; Mathematics 168B. Theory of individual consumer and market demand; theory of production and supply of agricultural products, with particular reference to the individual firm; pricing, output determination and employment of resources under pure competition. (Not open for credit to students who have completed Economics 100 or the equivalent; however, Economics 100 will not serve as prerequisite to course 100B.) GE credit: SocSci | QL, SS—II, III, II, III, I, III.  
(change in existing course—eff. winter 13)

100B. Intermediate Microeconomics: Imperfect Competition, Markets and Welfare Economics (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A. Pricing, consumer and producer determination, and employment of resources under conditions of monopsony, oligopoly, and monopolistic competition. GE credit: SocSci | QL, SS—II, III, II, I, II, III.  
(change in existing course—eff. winter 13)

106. Econometric Theory and Applications (4)  
Lecture—2 hours; discussion—1 hour. Prerequisite: course 100A, Statistics 103. Pass one open to Managerial Economics majors; pass two open to majors in the College of Agricultural and Environmental Sciences. Statistical methods for analyzing data to solve problems in managerial economics. Topics include the linear regression model, methods to resolve data problems, and the economic interpretation of results. Not open for credit to students who have enrolled in or completed Economics 140. GE credit: SocSci | QL, SS—II, III, IV, I, II, III, IV.  
(change in existing course—eff. fall 12)

112. Fundamentals of Organization Management (4)  
Lecture—4 hours. Prerequisite: upper division standing or consent of instructor. Pass One open to majors in the College of Agricultural and Environmental Sciences. Role of organizational design and behavior in business and public agencies. Principles of planning, decision making, individual behavior, management, leadership, information, conflict and change in the organization. GE credit: SocSci | SS—II, IV, I, II, III, IV.  
(change in existing course—eff. spring 13)

113. Fundamentals of Marketing Management (4)  
Lecture—4 hours. Prerequisite: Economics 1A. For non-majors only. Nature of product marketing by the business firm. Customer-product relationships, pricing and demand; new product development and marketing strategy; promotion and advertising; product life cycle; the distribution system; manufacturing, wholesaling, retailing. Government regulation and restrictions. (Not open for credit to students who have completed course 136.) GE credit: SocSci | SS.  
(change in existing course—eff. winter 13)

115A. Economic Development (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A and 1B. Major issues encountered in emerging from international problems, problems of growth and structural change, human welfare, population growth and health, labor markets and internal migration. Important issues of policy concerning international trade and industrialization. [Same course as Economics 115A] GE credit: SocSci, Div | SS, WC.—I, II, III, (III.)  
(change in existing course—eff. fall 11)

115B. Economic Development (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A and 1B. Macroeconomic issues of developing countries. Issues include problems in generating capital, conduct of monetary and fiscal policies, foreign aid and investment. Important issues of policy concerning international borrowing and external debt of developing countries. [Same course as Economics 115B] GE credit: SocSci | SS, WC.—II, III, (III.)  
(change in existing course—eff. fall 11)

119. Intermediate Managerial Accounting (4)  
Lecture—4 hours; extensive problem solving—8 hours. Prerequisite: Management 11A and 11B. Pass One open to majors in the College of Agricultural and Environmental Sciences. Use of accounting information by managers in decision making, planning, directing and controlling operations. Focuses on managerial accounting theory and practice. Covers costing systems, budgeting, and financial statement analysis. GE credit: SocSci | SS, III. (III.)  
(new course—eff. fall 13)

1205. Agricultural Policy (4)  
Lecture—4 hours. Prerequisite: course 100A or consent of instructor. Analytical treatment of historical and current economic problems and governmental policies influencing agriculture. Uses of economic theory to develop historical and conceptual understanding of the economics of agriculture; how public policy influences the nature and performance of agriculture. Taught in Australia under the supervision of a UC Davis faculty member. Not open for credit to students who have completed course 120. GE credit: SocSci | SS, WC.  
(change in existing course—eff. winter 13)

121. Economics of Agricultural Sustainability (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: Plant Sciences 15; Community and Regional Development 20; Economics 1A; Mathematics 12 or equivalent. Application of economic concepts to agro-environmental issues relevant to agricultural sustainability. Topics include market efficiency, production externalities, government policies, agricultural trade, product differentiation, all linked to sustainability issues. Case studies include genetically modified foods and genetically differentiated products. GE credit: SocSci | SS—II, III. (III.)  
(change in existing course—eff. winter 13)

130. Agricultural Markets (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A. The nature, function, organizational structure, and operation of agricultural markets; prices, costs, and margins; market information, regulation, and controls, cooperative marketing. GE credit: SocSci | SS—II, III. (III.)  
(change in existing course—eff. winter 13)

132. Cooperative Business Enterprises (3)  
Lecture—3 hours. Prerequisite: Economics 1A. Study of cooperative business enterprise in the United States and elsewhere; economic theories of behavior, principles of operation, finance, decision-making, and taxation. GE credit: SocSci | SS, WC.  
(change in existing course—eff. winter 13)

135. Agribusiness Marketing Plan Development (2)  
Lecture/discussion—2 hours. Prerequisite: upper division standing. Fundamental components required to develop a marketing plan. Appreciation of the concept of a marketing plan, appropriate research.  

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2013-2014 offering in parentheses

Pre-Fall 2011 General Education (GE): ArHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Domestic Diversity; Wrt—Writing Experience

Fall 2011 and on General Education (GE): AH—Arts and Humanities; SS—Science and Engineering; SS—Social Sciences; ACHG—American Cultures; DD—Domestic Diversity; OLS—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
required, including the use of library and Internet, survey and interview instruments, government documents, periodicals, and market proposition, action planning, financial evaluation and monitoring. (P/NP grading only.) GE credit: SS.

(change in existing course—eff. winter 13)

136. Managerial Marketing (4)
Lecture—4 hours. Prerequisite: course 100A; Statistics 103. Application of economic theory and statistics in the study of marketing. Marketing measurement and forecasting, market planning, market segmentation, determination of optimal product market mix, sales and cost analysis, conduct of marketing research, marketing models and systems. GE credit: SocSci | SS.—II, III, (II, III)

(change in existing course—eff. winter 13)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A and 100B; Economics 100. Pass One open to majors in the College of Agricultural and Environmental Sciences. Basic nature and scope of international trade in agricultural commodities, agricultural inputs, and natural resources. Market dimensions and policy implications. Case studies to illustrate import and export problems associated with different regions and commodities. GE credit: SocSci | SS.—II, III, (II, III)

(change in existing course—eff. winter 14)

139. Futures and Options Markets (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A; Statistics 103. Pass One open to majors in the College of Agricultural and Environmental Sciences. History, mechanics, and economic functions of futures and options markets; hedging; theory of intertemporal price formation and behavior of futures and options prices; price forecasting; futures and options as policy tools. GE credit: SocSci | SS.—II, III, (II, III)

(change in existing course—eff. winter 14)

140. Farm Management (5)
Lecture—5 hours. Prerequisite: Economics 1A. Farm organization and resources, economic and technological principles of decision making; analytical techniques and management control; problems in organizing and managing the farm business. GE credit: SocSci | SS

(change in existing course—eff. winter 13)

142. Personal Finance (3)
Lecture—3 hours. Prerequisite: Economics 1B. Management of income and expenditures by the household. Use of consumer credit, savings, and insurance by households. Principles of tax, retirement, and estate planning. GE credit: SocSci | SS.—II, III, (II, III)

(change in existing course—eff. winter 13)

143. Investments (3)
Lecture—3 hours. Prerequisite: course 142 or consent of instructor. Survey of investment institutions, sources of investment information, and portfolio theory. Analysis of the stock, bond and real estate markets from the perspective of the investor. GE credit: SocSci | SS.—II, III, (II, III)

(change in existing course—eff. winter 13)

144. Real Estate Economics (3)
Lecture—3 hours. Prerequisite: course 100A. The economic theory, analysis, and institutions of real estate markets and related financial markets. Case studies drawn from the raw land, single family, multi-family, industrial and office real estate markets. GE credit: SocSci | SS.—II, III, (II, III)

(change in existing course—eff. winter 13)

145. Farm and Rural Resources Appraisal (4)

(change in existing course—eff. winter 13)

146. Business, Government Regulation, and Society (3)

(change in existing course—eff. fall 12)

147A. Resource and Environmental Policy Analysis (4)
Lecture—3 hours. Prerequisite: Economics 1A; enrollment open to non-majors only. Natural resource use problems with emphasis on past and current policies and institutions affecting resource use; determinants, principles, and policies of natural resource use; property rights; conservation; private and public resource use problems; and public issues. (Students who have had or take course 100A, Economics 100, or the equivalent, must enroll in this course for 2 units rather than course 147.) GE credit: SocSci | SS

(change in existing course—eff. winter 13)

155. Quantitative Analysis for Business Decisions (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A, Statistics 103. Introduction to selected topics in management science and operations research: decision analysis for management, mathematical programming, competitive analysis, and others. GE credit: SocSci | QL, SS.—I, II, III, (II, III, IV)

(change in existing course—eff. winter 13)

156. Introduction to Mathematical Economics (4)
Lecture—4 hours. Prerequisite: courses 100A and 155; Mathematics 16C or 21C recommended. Students should note that the formal mathematical content of this course is higher than other courses in the curriculum. Linear algebra for economists; necessary and sufficient conditions in static optimization problems; implicit function theorem; economic methodology and mathematics, comparative statics, envelope theorem, Le Chatelier principle; applications to production and consumer models. GE credit: SocSci | QL, SS

(change in existing course—eff. winter 13)

157. Analysis for Production Management (4)
Lecture—4 hours. Prerequisite: course 100A; Statistics 103. Application of economic theory and quantitative methods in analyzing production management problems including inventory control, production scheduling, quality control, simulation, systems approach, and work measurement. GE credit: SS.—I, II, (II, I)

(change in existing course—eff. winter 13)

171A. Financial Management of the Firm (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 106 or Economics 140; consent of instructor. First of two courses in the Masters-level economics sequence. The linear regression model and generalizations are solved using a computer spreadsheet program. Not open for credit to students who have completed Economics 134. GE credit: SocSci | QL, SS.—I, II, (I, II)

(change in existing course—eff. winter 13)

171B. Financial Management of the Firm (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 171A. Financial analysis at the firm level: methods of capital budgeting; calculating the cost of capital; dividend policies; mergers and acquisitions; and special current topics in finance. GE credit: SocSci | QL, SS.—II, III, (II, III)

(change in existing course—eff. winter 13)

190. Topics in Managerial Economics (3)
Lecture—3 hours. Prerequisite: passing grades in course 100A and Statistics 103; consent of instructor. Selected topics in managerial economics, focusing on current research. May be repeated four times for credit when topic differs. Not offered every year. GE credit: SocSci | SS

(change in existing course—eff. fall 12)

192. Internship (1-6)
Internship—3-18 hours. Internship experience off and on campus in all subject areas offered in the Department of Agricultural and Resource Economics. Internships are supervised by a member of the staff. (P/NP grading only.) GE credit: SS

(change in existing course—eff. winter 13)

194HA-194HB. Special Study for Honors Students (4-4)
Independent study—3 hours; seminar—1 hour. Prerequisite: Minimum GPA of 3.500; course 100B; courses 106 and 155 (may be taken concurrently); major in Agricultural and Managerial Economics or Managerial Economics; senior standing. A program of research culminating in the writing of a senior honors thesis under the direction of a faculty adviser. (Deferred grading only, pending completion of sequence.) GE credit. SocSci | QL, SS.—I, II, III, (I, II, III)

(change in existing course—eff. winter 13)

197T. Tutoring in Managerial Economics (1-3)
Prerequisite: senior standing in Managerial Economics and consent of Department Chairperson. Undergraduates assist the instructor by tutoring students in one of the department’s regularly scheduled courses. (P/NP grading only.) GE credit: SS.—I, II, III, IV, (I, II, III, IV)

(change in existing course—eff. fall 12)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SS

(change in existing course—eff. winter 13)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SS

(change in existing course—eff. winter 13)

Graduate

253. Optimization with Economic Applications (4)
Lecture—3 hours; discussion—1 hour. Microeconomic topics in the framework of mathematical programming. — II, III. Paris

(change in existing course—eff. winter 13)

256A. Applied Econometrics I (4)
Lecture—4 hours. Prerequisite: course 106 or Economics 140; consent of instructor. First of two courses in the Masters-level economics sequence. The linear regression model and generalizations are applied to topics in agricultural and resource eco-
American Studies

New and changed courses in American Studies (AMS)

Lower Division

18. Religion in American Lives (4)
Lecture—3 hours; discussion—1 hour. Religions and spiritual practices in the United States, and their interrelationships with other aspects of U.S. history, society and culture; indigenous and imported faiths, and the impact of immigration, colonization and culture contact on religious systems. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—I. (II.) Wang
(change in existing course—eff. fall 13)

59. Music and American Culture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: completed Subject A requirement. An examination of music and American culture. Studies will explore music in its cultural contexts, which may include examinations of recording and broadcasting, of race, class, and gender, the role of technology, and relationships between musical production, consumption and listening. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—I. (II.) Kelmaj
(change in existing course—eff. fall 13)

Upper Division

139. Feminist Cultural Studies (4)
Lecture/discussion—4 hours. Prerequisite: one course in Women’s Studies or American Studies. The histories, theories, and practices of feminist traditions within cultural studies. (Same course as Women’s Studies 139.) GE credit: SocSci, Div, Wrt | ACGH, AH, DD, SS, VL, WE.—I. (II.) Billeckoff
(change in existing course—eff. fall 13)

155. Eating in America (4)
Lecture—3 hours; fieldwork. Prerequisite: course 1. Interdisciplinary examination of the culture of food in America. Exploration of eating as a richly symbolic social event integral to how Americans express and negotiate values, politics and identity. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH, DD, SS, VL, WE.—II. (III.) Kocoul

158. Technology and the Modern American Body (4)
Lecture/discussion—3 hours; term paper. Prerequisite: Technocultural Studies 1 and either course 1A or 5. The history and analysis of the relationships between human bodies and technologies in modern society. Dominant and eccentric examples of how human bodies and technologies influence one another and reveal underlying cultural assumptions. (Same course as Technocultural Studies 158.) GE credit: GE credit: GE credit: ArtHum | ACGH, AH, WE.—I, III. de la Pena
(change in existing course—eff. fall 13)

Animal Genetics

New and changed courses in Animal Genetics (ANG)

Upper Division

101. Animal Cyto genetics (3)
Laboratory/discussion—1 hour; laboratory—6 hours. Prerequisite: Biological Sciences 101, 102 or the equivalent. Principles and techniques of cyto genetics applied to animal systems; chromosome harvest techniques, analysis of mitosis and meiosis, karyotyping, chromosome banding, cytogenetic mapping, chromosome structure and function, comparative androgenetics. GE credit: SciEng | SE.—(III.) Famula
(change in existing course—eff. winter 13)

105. Horse Genetics (2)
Lecture—2 hours. Prerequisite: course 15 and Bi ological Sciences 101. Coat color, parentage testing, medical genetics, pedigrees, breeds, the gene map and genus Equus. Emphasis on understanding horse genetics based on the unity of mammalian genetics and making breeding decisions based on fundamental genetic concepts. GE credit: SciEng | SE, SL.—III. (III.) Medrano
(change in existing course—eff. winter 13)

107. Genetics and Animal Breeding (5)
Lecture—4 hours; laboratory—3 hours. Prerequisite: Biological Sciences 101. Principles of quantitative genetics applied to improvement of livestock and poultry. Effects of mating systems and selection methods are emphasized with illustration from current breeding practices. GE credit: SciEng | SE.—I. (II.) Wang

111. Molecular Biology Laboratory Techniques (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1C, 101, 102, 103. Introduction to the concepts and techniques used in molecular biology; the role of this technology in both basic and applied animal research, and participation in laboratories using some of the most advanced techniques in molecular biology. GE credit: SciEng | SE, SL, VL, WE.—I. (II.) Kocoul

Animal Science

New and changed courses in Animal Science (ANS)

Upper Division

15. Introductory Horse Husbandry (3)
Lecture—3 hours. Prerequisite: course 2 recommended. Introduction to care and use of light horses emphasizing the basic principles for selection of horses, responsibilities of ownership, recreational usage and raising of foals. GE credit: SciEng | QL, SE, VL—II. (III.) Roser

17. Canine Behavior: Learning and Cognition (3)
Lecture—3 hours. Domestic dog behavior from basic principles of learning to complex cognitive behaviors; interaction between learning and cognition including how these processes contribute to interactions with humans; basic genetic correlates of learning and cognition. GE credit: SciEng | VL.—(IV.) March
(new course—eff. summer 12)

21. Livestock and Dairy Cattle Judging (2)
Laboratory—6 hours. Prerequisite: course 1 or 2 recommended. Evaluation of type as presently applied to light horses, meat animals and dairy cattle. Relationship between form and function, farm and carcass quality, and form and milk production. GE credit: SciEng | OL, SE.—III. (IV.) Van Lien
(change in existing course—eff. winter 13)

22A. Animal Evaluation (2)
Laboratory—3 hours; fieldwork—30 hours (total). Prerequisite: course 21 or the equivalent. Attendance at 3 one-day weekend field trips required. Domestic livestock species with emphasis on visual appraisal, carcass evaluation, and application of performance information. Emphasis on accurate written and oral descriptions of evaluations. Prerequisite to intercol legiate judging competition. Offered in alternate years. (P/NP grading only.) GE credit: OL, SE.—(II.) Van Lien
(change in existing course—eff. winter 13)

41. Domestic Animal Production (2)
Laboratory—2 hours. Principles of farm animal management, including dairy and beef cattle, sheep, and swine. Industry trends, care and management, nutrition, and reproduction. GE credit: SciEng | SE.—I. (II.) Milloehner

41L. Domestic Animal Production Laboratory (2)
Discussion—1 hour; laboratory—3 hours. Prerequisite: course 41 may be taken concurrently. Animal production principles and practices, including five field trips to dairy cattle, beef cattle, sheep, and swine operations and campus labs. (P/NP grading only.) GE credit: QL, SE, SL, VL, WE.—II. (III., IV.) Milloehner, Van Lien
(change in existing course—eff. winter 13)

49A-K. Animal Management Practices (2)
Discussion—1 hour; laboratory—3 hours. The application of the principles of elementary biology to the management of a specific animal species. Among the topics offered: (A) Aquaculture, (B) Beef, (C) Dairy, (D) Goats, (E) Horses, (F) Laboratory Animals, (G) Meats, (H) Poultry, (I) Sheep, (J) Swine, (K) Captive and Companion Avian. Up to four different topics may be taken: (P/NP grading only).—I, II, III, IV, (V.)
112. Sustainable Animal Agriculture (3) Lecture/discussion—3 hours. Prerequisite: Biological Sciences 18 or consent of instructor. Statistics 100 or Physical Sciences 120 recommended. Current applications of sustainable animal agriculture including the challenges of animal production, animal needs, animal well-being, and the environment and resources for future food supply systems. Various scenarios for meeting sustainability objectives are evaluated using computer modeling. GE credit: SciEng or SocSci | QL, QL, SE or SS.—III. (III.) Kabreab (change in existing course—eff. winter 13)

118. Fish Production (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Wildlife, Fish, and Conservation Biology 120 and 121. Current practices in fish production; relationship between the biological aspects of species and the production systems, husbandry, management, and marketing practices utilized. Emphasis on species currently reared in California. GE credit: SciEng | SE.—II. (II.) Doroshov (change in existing course—eff. winter 13)

119. Invertebrate Aquaculture (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 18. Management, breeding and feeding of aquatic invertebrates; application of basic principles of physiology, reproduction, and nutrition to production of mollusks and crustaceans for human food; interaction of species biology and managerial techniques on production efficiencies. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

120L. Meat Science Laboratory (2) Discussion—1 hour; laboratory—3 hours. Prerequisite: Biological Sciences 1A; course 120 (may be taken concurrently). Laboratory exercises and student participation in transformation of live animal to carcass and meat, structural and biochemical changes related to meat quality, chemical and sensory evaluation of meat, and field trips to packing plant and processing plant. (Same course as Food Science and Technology 120L) GE credit: SciEng | SE. (change in existing course—eff. winter 13)

125. Equine Exercise Physiology (3) Lecture—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101. Distance learning class broadcast from California Polytechnic State University Pomona, and California State University San Luis Obispo, California Polytechnic State University. Lecture—3 hours. Prerequisite: course 115. Distance learning class broadcast from Cal Poly, Pomona and CSU Fresno on equine nutrition. Includes equine digestion, digestive physiology, diet development and evaluation, and the relationship of the topics to recommended feeding practices and nutritional portfolios. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

126. Equine Nutrition (3) Lecture—3 hours. Prerequisite: course 15, Nutrition 115. Distance learning class broadcast from Cal Poly, Pomona and CSU Fresno on equine nutrition. Includes equine digestion, digestive physiology, diet development and evaluation, and the relationship of the topics to recommended feeding practices and nutritional portfolios. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

127. Advanced Equine Reproduction (3) Lecture—3 hours. Prerequisite: an upper division physiology course (e.g., Neurobiology, Physiology, and Behavior 101) and an advanced horse production and management course (e.g., course 115). Distance learning course that provides indepth knowledge of the reproductive physiology, anatomy and endocrinology of the mare and stallion. Emphasis on structure/function relationships as they are applied to improving equine reproductive management and efficiency. GE credit: SciEng | QL, QL, SE, WE.—III. (III.) Roser (change in existing course—eff. winter 13)

128. Agricultural Applications of Linear Programming (4) Lecture—2 hours; laboratory—2 hours; discussion—1 hour. Prerequisite: upper division standing and Agricultural Systems and Environment 21 or the equivalent. Applications of linear programming in agricultural systems, analyzing resource allocation problems and decision making. Problems include crop production, ration formulation, and farm management. Hands-on experience in developing linear programs and interpreting results. GE credit: SciEng | QL, SE, SL.—II. (II.) Fadel (change in existing course—eff. winter 13)

129. Environmental Stewardship in Animal Production Systems (3) Lecture—3 hours. Prerequisite: Biological Sciences 10 or 1A and 1B, Chemistry 2A, 2B, 8A, 8B. Management of environmental stewardship for grazing lands, animal feeding operations and aquaculture operations; existing regulations, sample analyses, interpretation and utilization of data, evaluation of alternative practices, and policy development. GE credit: SciEng | QL, SE, SL.—II. Meyer (change in existing course—eff. winter 13)

131. Reproduction and Early Development in Aquatic Animals (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: Molecular and Cellular Biology 150; Wildlife, Fish, and Conservation Biology 120, or consent of instructor. Physiological and developmental functions related to reproduction, breeding efficiency and fertility of animals commonly used in aquaculture. GE credit: SciEng | SE, WE.—II. (II.) Doroshov (change in existing course—eff. winter 13)

136A. Techniques and Practices of Fish Culture (2) Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2. Daily care and maintenance of fish in residential aquariums, research and commercial facilities. Biological and environmental factors important to sound management of fish. Laboratories focus on fish culture and include growth trials. Not open for credit to students who have completed course 136E. GE credit: SciEng | QL, SE, SL, VL, WE.—I. (I.) Hung (change in existing course—eff. winter 13)

136B. Techniques and Practices of Avian Culture (2) Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2. Daily care and maintenance of birds for research, commercial production, and companion or hobby uses. Biological and environmental factors important to sound management of birds. Laboratories focus on bird husbandry, management and care, and include growth trials. GE credit: SciEng | QL, SE, SL, VL, WE.—I. (I.) Hung (change in existing course—eff. winter 13)

137. Animal Biochemistry Laboratory (2) Lecture—1 hour; laboratory—3 hours. Prerequisite: Animal Biology 102 or Biological Sciences 102 or the equivalent. Chemical and biochemical methods, and instruments commonly used in animal science. Wet chemical methods; UV/VISIBLE Spectrophotometry and atomic absorption spectrophotometry, thin-layer and gas-liquid chromatography, commercial chemical kits. Attention to safety. GE credit: SciEng | QL, SE, SL.—I, III. (I, III) Hung (change in existing course—eff. winter 13)

140. Management of Laboratory Animals (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101. Laboratory animal management procedures in view of animal physiology, health and welfare, government regulations, and experimental needs. Clinical techniques using rodents and rabbits as models. GE credit: SciEng | SE.—I, III. (I, III) Zinn (change in existing course—eff. winter 13)

142. Companion Animal Care and Management (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 42, Biological Sciences 101, Neurobiology, Physiology, and behavior 101, Animal Biology 102 and 122 recommended. Management and production of companion animals. Integration of the disciplinary principles of behavior, genetics, nutrition, and physiology as related to the care of companion animals. GE credit: SciEng | QL, QL, SE, SL, VL, WE.—I. (I.) Oberbauer (change in existing course—eff. winter 13)

143. Pig and Poultry Care and Management (4) Lecture—3 hours; laboratory—3 hours; Saturday field trips. Prerequisite: Nutrition 115, Neurobiology, Physiology, and Behavior 101; a course in Range Science and a course in animal production. GE credit: SciEng | QL, SE, SL.—II. (II.) Sainz, Zinn (change in existing course—eff. winter 13)

145. Meat Processing and Marketing (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 146 or consent of instructor. Production, processing and marketing of meat and meat products. Meat and meat animal grading and pricing. Government regulations and social/consumer considerations. Future trends and impact on production management practices. Includes poultry. GE credit: SciEng | QL, SE, SL.—II. (II.) King (change in existing course—eff. winter 13)

146. Dairy Cattle Production (5) Lecture—3 hours; laboratory—3 hours; fieldwork—1 hour; discussion—1 hour. Prerequisite: course 124, Animal Genetics 107, and Nutrition 115; or consent of instructor. Scientific principles from genetics, nutrition, physiology, and related fields applied to conversion of animal feed to human food through dairy animals. Management and economic decisions are related to animal biology considering the environment and animal well-being. Mandatory Saturday field trip. GE credit: SciEng, Wrt | QL, QL, SE, SL, VL, WE.—III. (III.) DePeters (change in existing course—eff. winter 13)

147. Dairy Processing and Marketing (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: course 146 or consent of instructor. Examination of distribution systems, processing practices, product quality, impact of government policy [domestic and foreign], marketing alternatives, and product development. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

149. Forester Science (3) Lecture—3 hours. Prerequisite: course 115. Distance learning class broadcast from California Polytechnic State University San Luis Obispo, California Polytechnic State University Pomona, and California Polytechnic State University San Luis Obispo.
Anthropology

New and changed courses in Anthropology (ANT)

Lower Division

3. Introduction to Archaeology (ANT 4)
Lecture—3 hours; discussion—1 hour. Development of archaeology as an anthropological study; objectives and methods of modern archaeology. GE credit: SciEng or SocSci, Div | SE, SL.

13. Scientific Method in Physical Anthropology (ANT 34)
Lecture—2 hours; laboratory/discussion—1 hour; fieldwork—1 hour. Skills for scientific thinking; designing, implementing, analyzing, interpreting, presenting, and critiquing research. Collection and analysis of data; basic statistical methods. GE credit: SciEng or SocSci, Wrt | OL, SE, VL, WE.

20. Comparative Cultures (ANT 54)
Lecture—3 hours; discussion—1 hour. Introduction to the anthropology and sociocultural diversity. Case studies of eight societies will be presented to illustrate and compare the distinctive features of major cultural regions of the world. Concludes with a discussion of modes of adaptation. GE credit: ArtHum or SocSci, Div | ACGH, AH or SS, DD, WC, WE.

50. Evolution and Human Nature (ANT 50)
Lecture—3 hours; discussion—1 hour. Evolutionary analyses of human nature, beginning with Lamarck, Darwin, Spencer and contemporaries, and extending through social Darwinism controversies to contemporary evolutionary biology research. Human nature in cultural, economic, mating, life-history, and social behavior. GE credit: SciEng or SocSci, Div, Wrt | SE or SS, SL, WE.

54. Introduction to Primatology (ANT 54)
Lecture/discussion—3 hours; term paper. Basic survey of the primates as a separate order of mammals; natural history of primates; consideration of hypotheses for their origin. GE credit: SciEng | SE, SL.

Upper Division

103. Indigenous Peoples and Natural Resource Conservation (ANT 103)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or Geology 1 or Environmental Science and Policy 30 or Evolution and Ecology 100 or Biological Sciences 101. Interdisciplinary study of social and cultural evolution in humans. Culture as a system of inheritance, processes of cultural learning, culture as an adaptive system, evolution of maladaptations, evolution of technology and institutions, evolutionary transitions in human history, coevolution of genetic and cultural variation. Not open for credit to students who have completed course 121. GE credit: SocSci | ACGH, DD, OL, SS, WC, WE.

105. Evolution of Societies and Cultures (ANT 105)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or 2 or Environmental Science and Policy 30 or Evolution and Ecology 100 or Biological Sciences 101. Interdisciplinary study of social and cultural evolution in humans. Culture as a system of inheritance, processes of cultural learning, culture as an adaptive system, evolution of maladaptations, evolution of technology and institutions, evolutionary transitions in human history, coevolution of genetic and cultural variation. Not open for credit to students who have completed Environmental Science and Policy 101 or course 101 prior to fall 2004. (Same course as Environmental Science and Policy 105.) GE credit: SciEng | OL, SS, WC, WE.

123AN. Resistance, Rebellion, and Popular Movements (ANT 123AN)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or the equivalent. Analysis of popular protest in Third World and indigenous societies ranging from covert resistance to national uprisings. Compare case studies and theories of peasant rebellions, millenarian movements, social bands, Indian “wars,” ethnic and regional conflicts, gender and class conflicts. Not open for credit to students who have completed course 123B or 123B (course 1238). GE credit: SciEng | SS, WC, WE.

124. Religion in Society and Culture (ANT 124)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Discussion of anthropological theories of religion with emphasis on non-literate societies. Survey of shamanism, magic and witchcraft, ritual and symbols, and religious movements. Extensive discussion of ethnographic examples and analysis of social functions of religious institutions. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

134. Buddhism in Global Culture (ANT 134)
Lecture—3 hours; discussion—1 hour. Prerequisite: one lower division course in Anthropology, Sociology, History, or Religious Studies. Buddhist meditation and ritual as a cultural system that adapts to global and local forces of change. Anthropological theory and method in understanding global culture transmission, including Buddhist reform movements in Asia and Buddhist practice in the West. Limited enrollment. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

154BN. Primate Evolutionary Ecology (ANT 154BN)
Lecture—3 hours; discussion—1 hour; term paper. Prerequisite: course 1 or introductory course in evolutionary biology or ecology. Examination of the ecology of primates within an evolutionary framework. Theoretical models, individual, population, and community ecology, illustrated with primate (and other vertebrate) examples. Includes topics in primate and rainforest conservation. GE credit: SciEng, Wrt | OL, SE, VL, WE.

154C. Behavior and Ecology of Primates (ANT 154C)
Lecture/discussion—2 hours. Prerequisite: course 54, 154A, or 154BN; Statistics 13 or its equivalent. Scientific methods of studying, describing and analyzing the behavior and ecology of primates. Offered in alternate years. (M/F grading only.) GE credit: SE, Isbell

154CL. Laboratory in Primate Behavior (ANT 154CL)
Laboratory—6 hours; term paper. Prerequisite: course 54, 154A, or 154BN; Statistics 13 or its equivalent. Design and conduct of scientific “field studies” of the behavior of group-living primates at the California National Primate Research Center. Offered in alternate years. GE credit: SciEng | OL, SE, WE, Isbell

156A. Human Osteology (ANT 156A)
Lecture—2 hours; laboratory—4 hours. Prerequisite: course 1 or equivalent. Human skeleton from archaeological, forensic, and paleontological perspectives, including anatomical nomenclature, variation with sex and age, function, evolution, growth, and development of bones and teeth. Hands-on study and identification of human skeletal material cannot be taken by students who have previously completed course 156. GE credit: SciEng | SE.

156B. Advanced Human Osteology (ANT 156B)
Lecture—2 hours; laboratory—4 hours. Prerequisite: course 156A or equivalent. Human skeletons from archaeological, forensic, and paleontological contexts. Bone and tooth structure, growth, and development; measurement, statistics, and biomechanics; assessment of age, sex, weight, height, and ancestry; and indicators of illness, injuries, diet, and activities. Offered in alternate years. GE credit: SciEng | SE.
determining past human diets and past environments. Offered in alternate years. GE credit: SciEng | QL, SE — Darwent, Steele

(change in existing course — eff. winter 13)

182. Archaeometry (4)
Lecture — 3 hours; discussion/lab — 1 hour. Prerequisite: course 3; Statistics 13 or the equivalent recommended. Scientific techniques used to study the chemical and physical properties of archaeological materials, and interpretation of anthropological questions that can be addressed with different methods. Preparation and analysis of archaeological materials. GE credit: SciEng | QL, SE, VL, WE. Offered in alternate years. — Eerkens

(change in existing course — eff. winter 13)

Applied Biological Systems Technology

New and changed courses in Applied Biological Systems Technology (ABT)

Lower Division

15. Wood Properties and Fabrication (2)
Lecture/discussion — 1 hour; laboratory — 3 hours. Study of wood properties and techniques for fabrication with wood. Gain experience working with various wood and woodworking tools for specific applications. [P/NP grading only.] GE credit: QL, QL, SE, VL — Ill. (Ill.) Shafi

(change in existing course — eff. winter 13)

16. Metal Properties and Fabrication (2)
Lecture — 1 hour; laboratory — 3 hours. Study of metal properties and of techniques for fabricating in metal. Physical principles, design considerations, effects of techniques on quality and appearance, and evaluation procedures. Experience in working with metal. [P/NP grading only.] GE credit: QL, QL, SE, VL — Ill. (Ill.) Grismer, Shafi

(change in existing course — eff. winter 13)

17. Plastic Properties and Fabrication (2)
Lecture — 1 hour; laboratory — 3 hours. Study of the properties of plastic materials and the fundamentals of fabrication techniques. Experience in working with common plastics, with applications to biological systems. [P/NP grading only.] GE credit: QL, QL, SE, VL — Ill. (Ill.) Shafi

(change in existing course — eff. winter 13)

49. Field Equipment Operation (2)
Lecture — 1 hour; laboratory — 3 hours. Operation, adjustment, and troubleshooting of farm tractors and field equipment. Principles of operation, equipment terminology and use of tillage, thinning and planting equipment. Typical sequences in cropping practices. [P/NP grading only.] GE credit: QL, QL, SE, VL — Ill. (Ill.) Shafi

(change in existing course — eff. winter 13)

52. Field Equipment Welding (2)
Lecture — 1 hour; laboratory — 3 hours. Prerequisite: course 16 or consent of instructor. Intermediate welding to include fillet and joint welding. Class projects on repair and fabrication by welding. Troubleshooting and major repair of field equipment. [P/NP grading only.] GE credit: QL, QL, SE, VL — Ill. (Ill.) Shafi

(change in existing course — eff. winter 13)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. [P/NP grading only.] GE credit: SE

(change in existing course — eff. winter 13)

Upper Division

101. Engine Technology (3)
Lecture — 2 hours; laboratory — 3 hours. Prerequisite: upper division standing or consent of instructor. Principles of 2-stroke cycle, 4-stroke cycle gasoline and 4-stroke cycle diesel engine construction and operation. Engine systems, performance, troubleshooting, and overhaul. GE credit: SciEng | QL, SE, VL — Ill. (Ill.) Rosa

(change in existing course — eff. winter 13)

110L. Experiments in Food Engineering (2)
Lecture — 6 hours. Prerequisite: Food Science and Technology 110B (may be taken concurrently). Use of temperature sensors; measurement of thermal conductivity and heat transfer; freezing, concentration and dehydration of foods. GE credit: SciEng | QL, SE, VL, WE — Ill. (Ill.) Singh

(change in existing course — eff. winter 13)

142. Equipment and Technology for Small Farms (2)
Lecture — 1 hour; laboratory — 3 hours. Types and characteristics of agricultural equipment and technologies appropriate for small commercial farming. Adjustment and calibration of equipment. Selection of and budgeting for equipment. [Same course as Agricultural Development 142.] GE credit: SciEng | QL, SE, VL — Ill. (Ill.) Peng

(change in existing course — eff. winter 13)

150. Introduction to Geographic Information Systems (4)
Lecture — 3 hours; laboratory — 3 hours. Prerequisite: Plant Sciences 21 or equivalent with consent of instructor. Priority given to College of Agricultural and Environmental Sciences majors. Basic concepts, principles and methods of GIS are presented. Data structures, database design, GIS data creation, GPS, and spatial analysis techniques are emphasized. Lab topics include: online data sources, aerial photogrammetry, GPS data input, suitability analysis, cartographic design and graphic communication. Not open for credit to students who have completed Applied Biological Systems Technology 180/Plant Sciences 180 or Applied Biological Systems Technology 181N. [Same course as Landscape Architecture 150.] GE credit: SciEng | QL, SE, VL — I. (I.) Greco, Upadhyaya

(change in existing course — eff. winter 13)

161. Water-Quality Management for Aquaculture (3)
Lecture — 3 hours. Prerequisite: Biological Sciences 18, Mathematics 16B, Chemistry 28. Basic principles of water chemistry and water treatment processes as they relate to aquaculture systems. Offered in alternate years. GE credit: SciEng | QL, SE, VL, II. — II. Piedrahita

(change in existing course — eff. winter 13)

163. Aquaculture Systems Engineering (3)
Lecture — 3 hours. Prerequisite: course 161. Design of aquacultural systems: design methodology, principles of fluid mechanics, site selection and facility
197T. Tutoring in Applied Biological Systems Technology (1-5)
Tutorial. Tutoring individual laboratory, leading small voluntary discussion groups, or assisting the instructor in laboratories affiliated with one of the department’s regular courses. May be repeated for credit if topic differs. [P/NP grading only] GE credit: SE
(change in existing course—eff. winter 13)

165. Irrigation Practices for an Urban Environment (2)
Lecture—2 hours. Prerequisite: Physics 1A or 5A. Basic design, installation, and operation principles of irrigation systems for turf and landscape: golf courses, parks, highways, public buildings, etc. Emphasis on hardware association with sprinkler and drip/trickle systems. GE credit: SciEng | QL, SE, VL—II. (II.) Delwiche, Grismer
(change in existing course—eff. winter 13)

180. Introduction to Geographic Information Systems (4)
Lecture—2 hours; laboratory/discussion—3 hours. Prerequisite: Agricultural Management and Rangeland Resources 21 or equivalent familiarity with computers, Agricultural Management and Rangeland Resources 120 or the equivalent, Mathematics 16A. Management and analysis of georeferenced data. Spatial database management and modeling. Applications to agriculture, biological resource management, and social sciences. Cartographic modeling. Vector and raster-based geographic information systems. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 132 or equivalent as a course in Plant Sciences 180. GE credit: SciEng | SE, VL—I. (I.) Plant
(change in existing course—eff. winter 13)

181N. Concepts and Methods in Geographic Information Systems (4) Lecture/laboratory—8 hours. Prerequisite: course 180 or Agricultural Management and Rangeland Resources 180 and Landscape Architecture 50 or consent of instructor. Data representation and analysis in geographic information systems (GIS). Creation of spatial data sets from analog and digital sources such as aerial photography and maps; data structures, data management, database design, georeferencing, geocodification, surface models, analysis, and spatial data visualization. Offered in alternate years. GE credit: SciEng | QL, SE, SL, VL—II. Plant
(change in existing course—eff. winter 13)

182. Environmental Analysis using GIS (4) Lecture—2 hours; laboratory—4 hours. Prerequisite: course 180 or consent GIS experience and skills; general biology and/or ecology courses recommended. Ecosystem and landscape modeling with emphasis on remote sensing and solute transport. Spatial analysis of environmental risk analysis including ecological risk assessment, natural resource management. Spatial database structures, scripting, data models, and error analysis in GIS. Offered in alternate years. GE credit: SciEng | QL, SE, SL, VL—III. Zhang
(change in existing course—eff. winter 13)

190C. Research Conference for Advanced Undergraduates (1-3)
Discussion—1 hour. Prerequisite: consent of instructor. Research conferences for specialized study in applied biological systems technology. May be repeated for credit. [P/NP grading only] GE credit: SE—I, II, III, [I, II, III]
(change in existing course—eff. winter 13)

192. Internship in Applied Biological Systems Technology (1-3) Internship—3-1.5 hours. Prerequisite: upper division standing, approval of project prior to period of internship. Supervised internship in applied biological systems technology. May be repeated for credit. [P/NP grading only] GE credit: SE
(change in existing course—eff. winter 13)

197T. Tutoring in Applied Biological Systems Technology (1-5) Tutorial. Tutoring individual laboratory, leading small voluntary discussion groups, or assisting the instructor in laboratories affiliated with one of the department’s regular courses. May be repeated for credit if topic differs. [P/NP grading only] GE credit: SE
(change in existing course—eff. winter 13)

198. Directed Group Study (1-5) Prerequisite: consent of instructor. [P/NP grading only] GE credit: SE
(change in existing course—eff. winter 13)

199. Special Study for Advanced Undergraduates (1-5) [P/NP grading only] GE credit: SE
(change in existing course—eff. winter 13)

Arabic

New and changed courses in Animal Arabic (ARB)

Lower Division
1. Elementary Arabic 1 (5)
Lecture/discussion—5 hours. Introduction to basic Arabic. Interactive and integrated presentation of listening, speaking, reading, and writing skills, including the alphabet and basic syntax. Focus on standard Arabic with basic skills spoken Egyptian and/or one other colloquial dialect. GE credit: ArtHum | AH—Hassouna
(change in existing course—eff. winter 13)

1A. Intensive Elem Arabic (15)
Lecture/discussion—15 hours. Special 12-week accelerated, intensive summer session course that combines the work of courses 1, 2, and 3. Introduction to Modern Standard Arabic through development of all language skills in a cultural context with emphasis on communicative proficiency. Not open for credit to students who have completed course 1, 2, or 3. Not offered every year. GE credit: ArtHum | AH, WC—IV. [IV]
(change in existing course—eff. winter 13)

2. Elementary Arabic 2 (5)
Lecture/discussion—5 hours. Prerequisite: course 1 or with instructor’s consent after taking all components of the final exam for course 1. Continues introduction to basic Arabic from course 1. Interactive and integrated presentation of listening, speaking, reading, and writing, including syntax. Focus on standard Arabic with limited use of spoken Egyptian and/or one other colloquial dialect. GE credit: ArtHum | AH—II. (II.) Hassouna
(change in existing course—eff. winter 13)

3. Elementary Arabic 3 (5)
Lecture/discussion—5 hours. Prerequisite: course 2 and/or with consent of instructor after taking all components of the final exam for course 1 and 2. Continues introduction to basic Arabic from courses 1 and 2. Interactive and integrated presentation of listening, speaking, reading, and writing skills, including syntax. Focus on standard Arabic with limited use of spoken Egyptian and/or one other colloquial dialect. GE credit: ArtHum | AH—III. (III.) Hassouna
(change in existing course—eff. winter 13)

21. Intermediate Arabic 21 (5)
Lecture/discussion—5 hours. Prerequisite: course 1, 2, 3, or with consent of instructor after taking all parts of course 3 final exam. Builds on courses 1, 2, and 3. Interactive and integrated presentation of listening, speaking, reading, and writing skills, including idiomatic expression. Focus on standard Arabic with limited use of Egyptian and/or one other colloquial dialect. GE credit: ArtHum | AH—Ill. (Ill.) Hassouna
(change in existing course—eff. winter 13)

22. Intermediate Arabic 22 (5) Lecture/discussion—5 hours. Prerequisite: course 21 or with consent of instructor after taking all parts of course final 21 exam. Continues from course 21. Interactive and integrated presentation of listening, speaking, reading, and writing skills, including idiomatic expression. Focus on standard Arabic with limited use of Egyptian and/or one other colloquial dialect. GE credit: ArtHum | AH—II. (II.) Hassouna
(change in existing course—eff. winter 13)

23. Intermediate Arabic 23 (5) Lecture/discussion—5 hours. Prerequisite: course 22 or with consent of instructor after completing all parts of the final exams for courses 21 and 22. Continues from courses 21 and 22. Interactive and integrated presentation of listening, speaking, reading, and writing skills, including idiomatic expression. Focus on standard Arabic with limited use of Egyptian and/or one other colloquial dialect. GE credit: ArtHum | AH—II. (II.) Hassouna
(change in existing course—eff. winter 13)

Upper Division

121. Advanced Arabic (4) Lecture/discussion—3 hours. Term paper. Prerequisite: course 23 or consent of instructor. Review, refinement, and development of skills learned in intermediate Arabic through work with texts, video, and audio on cultural and social issues. Integrated approach to reading, writing, listening, speaking primarily standard Arabic, with limited use of one colloquial dialect. May be repeated two times for credit based on different readings. GE credit: ArtHum | AH, WC—II. (II.) Sharlet
(change in existing course—eff. winter 13)

122. Advanced Arabic (4) Lecture/discussion—3 hours. Prerequisite: course 121 or permission of instructor. Continuation of course 121. Further development of advanced skills in reading, writing, listening, and speaking standard Arabic through work with texts, video, and audio on cultural and social issues. Limited use of one colloquial dialect. GE credit: ArtHum | AH, WC—II. (II.) Radwan
(change in existing course—eff. winter 13)

123. Advanced Arabic (4) Lecture/discussion—3 hours. Prerequisite: course 122 or permission of instructor. Continuation of course 122. Further development of advanced skills in reading, writing, listening, and speaking standard Arabic through work with texts, video, and audio on cultural and social issues. Limited use of one colloquial dialect. GE credit: ArtHum | AH, WC—Ill. (III.) Radwan
(change in existing course—eff. winter 13)

140. A Story for a Life: The Arabian Nights (4) Lecture/discussion—3 hours. Term paper. In-depth investigation of the best-known work of pre-modern Arabic literature, taught in translation. Not open for credit to students who have taken Middle East/South Asia 121A. [Same course as Middle East/ South Asia Studies 121A.] Offered in alternate years. GE credit: ArtHum | AH, OL, WC, WE—II. (II.) Sharlet
(new course—eff. fall 13)
Art History

New and changed courses in Art History (AH)

Lower Division

1DV. Arts of Asia (Virtual) (5) (cancelled course—eff. winter 14)

1DV. Arts of Asia (5)

Web virtual lecture—2.5 hours; discussion—1 hour; lecture/discussion—1.5 hours. Introduction to major forms and trends in the arts and material culture of Asia from the Neolithic to the contemporary, emphasizing the visual manifestation of secular and religious ideas and ideals. Not open for credit to students who have completed course 1D. GE credit: ArtHum, Div | AH, VL, WC, WE.—I. [I] Burnett (change in existing course—eff. spring 14)

Upper Division

172A. Early Greek Art and Architecture (4)
Lecture—3 hours; term paper. Examination of the origin and development of the major monuments of Greek art and architecture from the eighth century B.C. Not open for credit to students who have completed course 154A. Same course as Classics 172A. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—II. [II] Roller (change in existing course—eff. fall 11)

172B. Later Greek Art and Architecture (4)
Lecture—3 hours; term paper. Study of the art and architecture of late Classical and Hellenistic Greece, from the mid-fifth century B.C. Not open for credit to students who have completed course 154B. Same course as Art History 172B. Offered in alternate years. GE credit: ArtHum | AH, VL, WC, WE.—II. [II] Roller (change in existing course—eff. fall 11)

173. Roman Art and Architecture (4)
Lecture—3 hours; term paper. The art and architecture of Rome and the Roman Empire, from the founding of Rome through the fourth century C.E. Not open for credit to students who have completed course 155. Same course as Classics 173. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—II. [II] Roller (change in existing course—eff. fall 11)

175. Architecture and Urbanism in Mediterranean Antiquity (4)
Lecture—3 hours; extensive writing. Prerequisite: a lower division Classics course (except 30, 31), course 1A recommended. Architecture and urban development in the ancient Near East, Greece, and Rome. Special emphasis on the social structure of the ancient city as expressed in its architecture, and on the interaction between local traditions and the impact of Greco-Roman urbanism. Same course as Classics 175. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—II. [II] Roller (change in existing course—eff. fall 11)

176C. Art of the Middle Ages: Gothic (4)
Lecture—3 hours; term paper or gallery studies and review. Painting, sculpture and architecture in northern Europe from the twelfth through the fifteenth centuries. GE credit: ArtHum | AH, VL, WC, WE. (change in existing course—eff. winter 13)

183D. Modern Sculpture (4)
cancelled course—eff. fall 97)

190A-H. Undergraduate Proseminar in Art History (4)
Lecture/discussion—3 hours; term paper. Prerequisite: Art History major, minor, or other significant training in Art History recommended. Study of a broad problem or theoretical issue. Intensive reading, discussion, research, writing. Topics (A) Mediterranean Antiquity; (B) Medieval; (C) Renaissance; (D) American Art; (E) Gendering of Culture; (F) Chinese Art and Material Culture. GE credit: ArtHum | AH, OL, VL, WC, WE.—I. [I] III. [II, III] (change in existing course—eff. winter 13)

103A. Intermediate Drawing: Black and White (4)
Studio—6 hours. Prerequisite: courses 2. Advanced study of drawing composition using black and white media. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL.—Henderson, Hollowell, Pardee, Werfel (change in existing course—eff. winter 13)

103B. Intermediate Drawing: Color (4)
Studio—6 hours. Prerequisite: courses 2. Study of drawing composition in color media. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL.—Henderson, Hollowell, Pardee, Werfel (change in existing course—eff. winter 13)

105A. Advanced Drawing: Studio Projects (4)
Studio—6 hours. Prerequisite: courses 4; course 103A or 103B. Study of the figure through drawing of the model. Exploration of different methods and process of figure-drawing. Pass 1 restricted Art Studio majors. May be repeated for credit one time. GE credit: ArtHum | AH, VL.—Henderson, Hollowell, Pardee, Werfel (change in existing course—eff. winter 13)

105B. Advanced Drawing: Figure (4)
Studio—6 hours. Prerequisite: course 4; course 103A or 103B. Study of the figure through drawing of the model. Exploration of different methods and process of figure-drawing. Pass 1 restricted Art Studio majors. May be repeated for credit one time. GE credit: ArtHum | AH, VL.—Henderson, Hollowell, Pardee, Werfel (change in existing course—eff. winter 13)

110A. Intermediate Photography: Black and White Analog (4)
Studio—6 hours. Prerequisite: course 9. Introduction to 35mm and medium format camera. Development of personal aesthetic and portfolio of black and white prints. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL.—Geiger, Suh (change in existing course—eff. winter 13)

110B. Intermediate Photography: Digital Imaging (4)
Studio—6 hours. Prerequisite: course 9. Comprehensive introduction to all elements of digital photography, including scanning, imaging software and printing. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL.—Geiger, Suh (change in existing course—eff. winter 13)

111A. Advanced Photography: Special Topics (4)
Studio—6 hours. Prerequisite: course 9; course 110A or 110B. Pass One open to Art Studio majors. Special topics related to photography and contemporary art practice. Multiple projects in a variety of approaches. May be repeated two times for credit when topic differs. GE credit: ArtHum | AH, VL.—Geiger, Suh (change in existing course—eff. fall 13)

111B. Advanced Photography: Digital Imaging (4)
Studio—6 hours. Prerequisite: courses 2, 7, 101; course 102A or 102B. In-depth exploration of digital photography, including scanned images and theoretical issues involved in digital media. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL.—Geiger, Suh (change in existing course—eff. winter 13)

112. Sound for Vision (4)
Studio—6 hours. Prerequisite: course 12 or Techno-cultural Studies 100. Sound composition and development of an audio database. Study of repetition and phase shifts. Creation of descriptive acoustic
125B. Intermediate Printmaking: Intaglio (4)
Studio—6 hours. Prerequisite: course 11. Metal plate etching, aquatint, hard and soft ground, burin engraving and related printmaking techniques. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Berry
[change in existing course—eff. winter 13]

125C. Intermediate Printmaking: Lithography (4)
Studio—6 hours. Prerequisite: course 11. Stone and metal-plate lithography and other planographic printmaking methods. Exploration of the basic chemistry and printing procedure inherent in stone lithography. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Berry
[change in existing course—eff. winter 13]

125D. Intermediate Printmaking: Serigraphy (4)
Studio—6 hours. Prerequisite: course 11. Printmaking techniques in silk screen and related stencil methods. Development of visual imagery using the language of printmaking. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL
[change in existing course—eff. winter 13]

129. Advanced Printmaking (4)
Studio—6 hours. Prerequisite: completion of two of: 125A, 125B, 125C, or 125D. Development of intermedia printmaking. Advanced modes in print technologies: relief, serigraphy, intaglio, intaglio surfaces, as well as additions to the printmaking process. May be repeated for credit two times. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL
[change in existing course—eff. winter 13]

138. The Artist's Book (4)
Studio—6 hours. Prerequisite: completion of three upper division Art Studio courses. Creation of an artist's book in an edition of three. Use of a variety of medium. May be repeated for credit one time. Pass 1 restricted Art Studio majors. Offered in alternate years. GE credit: ArtHum | AH, VL — Geiger, Hill, Suh
[change in existing course—eff. winter 13]

142A. Intermediate Ceramic Sculpture: Mold Work (4)
Studio—6 hours. Prerequisite: course 8. Pass One open to Art Studio majors. Creation of ceramic sculpture employing moldworking processes such as: slip casting, hand building, and sprigging. May be repeated one time for credit. GE credit: ArtHum | AH, VL — Rosen
[change in existing course—eff. winter 14]

142B. Intermediate Ceramic Sculpture: Clay, Glaze, and Klin (4)
Studio—6 hours. Prerequisite: course 8. Pass One open to Art Studio majors. Study and practice of glaze formation. Concentration on the use of color in ceramic sculpture. Practical experience with kiln firing. May be repeated one time for credit. GE credit: ArtHum | AH, VL — Rosen
[change in existing course—eff. winter 14]

143A. Advanced Ceramic Sculpture: Studio Projects (4)
Studio—6 hours. Prerequisite: courses 8; 142A or 142B. Exploration of ceramic fabrication. Hollow and solid building, casting, throwing, using fired, found, and fabricated ceramic elements. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Rosen
[change in existing course—eff. winter 13]

143B. Advanced Ceramic Sculpture: Issues in Contemporary Ceramics (4)
Studio—6 hours. Prerequisite: course 8; 142A or 142B. Studio individual work in conjunction with readings, field trips, critiques and writing about contemporary ceramic art. May be repeated for credit two times. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Rosen
[change in existing course—eff. winter 13]

148. Theory and Criticism: Painting and Sculpture (4)
Lecture—3 hours; term paper. Prerequisite: course 5 or 7. Study of forms and symbols in historic and contemporary masterpieces. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WE—I, Thiebaud
[change in existing course—eff. spring 13]

151. Intermediate Sculpture (4)
Studio—6 hours. Prerequisite: course 5. Individualized explorations through multiple projects in a variety of sculpture media and techniques. Builds upon technical concepts covered in course 5. May be repeated two times for credit when topic differs. GE credit: ArtHum | AH, VL — Bills, Hill, Puls
[change in existing course—eff. fall 13]

152A. Advanced Sculpture: Studio Projects (4)
Studio—6 hours. Prerequisite: courses 5, 151. Sculpture for advanced students. Emphasis on concept, idea development and honing technical skills. Approaches and projects will vary according to the instructor. May be repeated for credit one time when topic differs. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Rosen
[change in existing course—eff. winter 13]

152C. Advanced Sculpture: Concepts (4)
Studio—6 hours. Prerequisite: courses 5, 151. Investigation of a specific idea chosen by the class. Relation of idea to form and content. Individual development of conceptual awareness. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Puls
[change in existing course—eff. winter 13]

152D. Advanced Sculpture: Metals (4)
Studio—6 hours. Prerequisite: courses 5, 151. Technical aspects of the use of metals in contemporary art practice. Projects assigned to demonstrate the evolution of concepts and processes. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Bills
[change in existing course—eff. winter 13]

152E. Advanced Sculpture: Site Specific Public Sculpture (4)
Studio—6 hours. Prerequisite: courses 5, 151. Place and site specificity in contemporary sculpture. Individual and group work to credit. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Bills
[change in existing course—eff. winter 13]

152F. Advanced Sculpture: Figure (4)
Studio—6 hours. Prerequisite: courses 5, 151. Exploration of historical and contemporary approaches to the body in three-dimensions. Projects based on observational and conceptual strategies.
Asian American Studies

New and changed courses in Asian American Studies (ASA)

Lower Division

1. Historical Experience of Asian Americans
   Lecture—2 hours; discussion—1 hour. Introduction to Asian American Studies through an overview of the history of Asians in America from the 1840s to the present within the context of the development of the United States. GE credit: ArtHum or SocSci, Div, Wrt | ACCH, AH or SS, DD, VL, WC, WE—I, II, III. (change in existing course—eff. winter 13)

2. Contemporary Issues of Asian Americans
   Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Introduction to Asian American Studies through the critical analysis of the impact of race, ethnicity, imperialism, militarism, and immigration since post-World War II on Asian Americans. Topics may include sexuality, criminality, class, and the development of interethnic relations. GE credit: ArtHum or SocSci, Div, Wrt | ACCH, AH or SS, DD, VL, WC, WE—I, II, III. (change in existing course—eff. winter 13)

Upper Division

100. Asian American Communities
   Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Survey and analysis of Asian American communities within both historical and contemporary contexts. Presentation of the analytical skills, theories, and concepts needed to describe, explain, and understand the diversity of Asian American communities within the larger, dominant society. GE credit: ArtHum or SocSci, Div | ACCH, AH or SS, DD, WC, WE—I, II, III. Hamamoto, Kim, Maira (change in existing course—eff. winter 13)

113. Asian American Sexuality
   Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3. Restrictive US immigration laws, labor exploitation, race-based exclusionary laws, removal and internment, anti-miscegenation laws, and other examples of social control are surveyed to assess their role in shaping the sexuality of the different Asian American groups. GE credit: ArtHum or SocSci, Div | ACCH, AH or SS, DD, WC, WE—I, II, III. Hamamoto (change in existing course—eff. winter 13)

115. Multiracial Asian Pacific American Issues
   Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Introduction to the experiences of biracial and multiracial Asian Pacific people in the U.S., concentrating on theories of race, racial identity formation, culture, media, and anti-racist struggles. Critical approaches to the analysis of popular media and academic representations. Offered in alternate years. GE credit: SocSci, Div | ACCH, DD, OL, SS, WC, WE—Valverde (change in existing course—eff. winter 13)

116. Asian American Youth
   Lecture—3 hours; term paper. Prerequisite: course 1, 2, or 3. Social experiences of diverse groups of Asian American youth. Ways in which youth themselves actively create cultural expressions and political interventions. GE credit: ArtHum or SocSci, Div | ACCH, AH or SS, DD, OL, WE—Maira (change in existing course—eff. winter 13)

121. Asian American Performance
   Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Performance work by, for, and/or about Asian Pacific Americans including dramatic literature, performance art, dance, and film. Ethnicity, gender and sexuality, class and age as they intersect with Asian Pacific American identities are analyzed through dramatic performance. Offered in alternate years. GE credit: ArtHum | ACCH, AH, DD, OL, WE—I, II, III. Min, See (change in existing course—eff. winter 13)

132. Health Issues Confronting Asian Americans
   Lecture/discussion—4 hours. Health issues confronting Asian Americans and Pacific Islanders. (Same course as Public Health Sciences 132.) GE credit: SocSci | SS—Chen (change in existing course—eff. winter 13)

150. Filipino American Experience
   Lecture/discussion—4 hours. Prerequisite: course 1 or 2. Examining the relationship between the Filipino-American community, the Philippine homeland community and the larger American society through a critical evaluation of the historical and contemporary conditions, problems and prospects of Filipinos in the U.S. GE credit: SocSci | ACCH, DD, SS, WC—III. Rodriguez (change in existing course—eff. winter 13)

150B. Japanese American Experience
   Lecture—3 hours; term paper. Prerequisite: course 1 and upper division standing or consent of instructor. Analytical approaches to understanding Japanese American history, culture and society. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | ACCH, AH or SS, DD, VL, WC, WE—I, II, III. Hamamoto (change in existing course—eff. winter 13)

150C. Chinese American Experience
   Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Survey of the historical and contemporary experiences of Chinese in the United States, starting with the gold rush era and concluding with the present-day phenomenon of Chinese transnational movements to the United States and its diasporic significance. Offered in alternate years. GE credit: ArtHum or SocSci, Div | ACCH, AH or SS, DD, VL, WC, WE—I, II. (change in existing course—eff. winter 13)

150D. Korean American Experience
   Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Interdisciplinary survey of the historical and contemporary experiences of Koreans in the United States from the late nineteenth century to the present. Offered in alternate years. GE credit: ArtHum or SocSci, Div | ACCH, AH or SS, DD, VL, WC, WE—I, II, III. Hamamoto (change in existing course—eff. winter 13)

150E. Southeast Asian American Experience
   Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Upper division status. Historical survey of Southeast Asian experiences with special focus on United States involvement and post-1975 migrations. Delves into international and transnational conditions that led up to the large exodus and resettlement of Southeast Asians. Offered in alternate years. GE credit: ArtHum or SocSci, Div | ACCH, AH or SS, DD, OL, WC, WE—I, II, III. Valverde (change in existing course—eff. winter 13)

155. Asian American Legal History
   Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Legal history of Asian Americans, from the mid-19th century to present. Laws and administrative policies affecting Asian American communities, including those governing immigration, social and economic participation, WWII internment, and affirmative action. GE credit: SocSci | ACCH, DD, SS, WE (change in existing course—eff. winter 13)

189A. Topics in Asian American Studies
   Lecture—4 hours. Prerequisite: course 1, 2, or 3 and upper division standing, or consent of instructor. Intensive treatment of a topic in Asian American Studies. May be repeated for credit when topics differ. Not offered every year. GE credit: SocSci | ACCH, DD, SS, WC, WE (change in existing course—eff. winter 13)

189B. Topics in Asian American Studies
   Lecture—4 hours. Prerequisite: course 1, 2, or 3 and upper division standing, or consent of instructor. Intensive treatment of a topic in Asian American Studies. Culture. May be repeated for credit when topics differ. Not offered every year. GE credit: ArtHum or SocSci | AH or SS. (change in existing course—eff. winter 13)

189C. Topics in Asian American Studies
   Lecture—4 hours. Prerequisite: course 1, 2, or 3 and upper division standing, or consent of instructor. Intensive treatment of a topic in Asian American Studies.
Astronomy
New and changed courses in Astronomy (AST)

25. Introduction to Modern Astronomy and Astrophysics (4)
Lecture—3 hours; lecture/discussion—2.5 hours. Prerequisite: good facility in high school physics and mathematics (algebra and trigonometry). Description and interpretation of astronomical phenomena using the laws of modern physics and observations by modern astronomical instruments. Gravity, relativity, electromagnetic radiation, atomic and nuclear processes in relation to the structure and evolution of stars, galaxies and the universe. Not open to stu-
dents who have received credit for course 2, 10G, or 10L. GE credit: SciEng | SE, SL, VL—I. (F.) Fassnacht, Lubin.

[change in existing course—eff. winter 13]

Atmospheric Science
New and changed courses in Atmospheric Science (AIS)

30. Issues in Atmospheric Science (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: high school physics. Introduction to selected topics in atmospheric science, such as: meteorological aspects of air pollution, use of computer models in weather forecasting, theories of global climate change, impact of satellites on meteorology, and modern meteorological instrumentation. (P/NP grading only.) GE credit: SE, SL, VL—I. II. (Ill.) Anastasio
[change in existing course—eff. winter 13]

60. Introduction to Atmospheric Science (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 16A or 21A and Physics 5A, 7A or 9A. Fundamental principles of the physics, chemistry, and fluid dynamics underlying weather and climate. Solar radiation, the greenhouse effect, and the thermal budget of the Earth. Clouds and their formation, convection, precipitation, mid-latitude storm sys-
tems. GE credit: SciEng | QL, SE, VL—I. (I.) Faloona
[change in existing course—eff. winter 13]

Upper Division
110. Weather Observation and Analysis (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 60. Acquisition, distribution and analysis of meteorological data. Vertical sounding analysis, sta-
bility indices, probability of local severe weather, weather map analysis. Use of National Weather Ser-
vise analyses and forecast products. Laboratory makes use of computer-generated analyses. GE credit: SciEng | QL, QL, SE, VL—I. II. (II.) Chen
[change in existing course—eff. winter 13]

111. Weather Analysis and Prediction (3)
Lecture—3 hours. Prerequisite: courses 110, 121B, 111L (concurrent), knowledge of a programming language. Tools for analyzing observed properties of mid-latitude weather systems. The analysis-forecast system and various forecast mod-
els. General structure and properties of mid-latitude weather systems. GE credit: SciEng | QL, SE, VL—I. II. (II.) Grotjahn
[change in existing course—eff. winter 13]

111L. Weather Analysis and Prediction Laboratory (2)
[cancelled course—eff. spring 14]

111LY. Weather Analysis and Prediction Laboratory (2)
Laboratory—2 hours; web virtual lecture—4 hours. Prerequisite: course 111L (concurrent). Subjective and objective analysis of weather data. Web-based learning of the analysis-forecast system and various weather forecasting situations. Weather map inter-
pretation and forecast discussions. (P/NP grading only.) GE credit: SciEng | QL, QL, SE, VL—I. II. (II.) Grotjahn
[new course—eff. fall 13]

115. Hydrometeorology (3)
Lecture—3 hours. Prerequisite: course 60. Examina-
tion of climate and its functioning for the hydro-
logic system. Emphasis on seasonal variations in the relationship between precipitation and evapotranspi-
ration for meso-scale areas. Watershed modeling of floods and drought for evaluating the effects of cli-
matic fluctuations. GE credit: SciEng | QL, SE, SL—III. (III.)
[change in existing course—eff. winter 13]

116. Climate Change (4)
Lecture—3 hours; extensive writing. Prereq-
usite: University Writing Program 1; consent of instructor. Climate trends and patterns spanning the recent past and the future. Emphasis on natural processes that produce climate variations and human influence on these processes. Evidence of climate change and the role of global climate models in understanding cli-
mate variability. GE credit: SciEng | QL, SE, WE—III. (III.)
[change in existing course—eff. winter 13]

120. Atmospheric Thermodynamics and Cloud Physics (4)
Lecture—3 hours, extensive problem solving. Prereg-
usite: Mathematics 21C, Physics 9B, course 60 (may be taken concurrently). Atmospheric composi-
tion and structure, thermodynamics of atmospheric gases, thermal properties of dry and moist air, atmo-
spheric stability; cloud nucleation, cloud growth by condensation and collision, cloud models. GE credit: SciEng | QL, SE, VL—I. II. (II.) Fasold
[change in existing course—eff. winter 13]

121A. Atmospheric Dynamics (4)
Lecture—3 hours; extensive problem solving. Prereg-
usite: course 120, Mathematics 21D, Physics 9B Fundamental forces of atmospheric flow; noninertial reference frames; development of the equations of motion for rotating stratified atmospheres; jostabi-
listic and natural coordinate systems; geometric flow; thermal wind; circulation and vorticity. GE credit: SciEng | QL, SE—I. II. (II.) Nathan
[change in existing course—eff. winter 13]

121B. Atmospheric Dynamics (4)
Lecture—3 hours; extensive problem solving. Prereg-
usite: course 121A. Dynamics of fluid motion in geophysical systems, quasi-geostrophic theory; funda-
mentals of wave propagation in fluids; Rossby waves; gravity waves; fundamentals of hydrody-
namic instability; two-level model; baroclinic instabil-
ity and baroclinic wave propagation; stratospheric and tropospheric waveguides. GE credit: SciEng | QL, SE—III. (III.) Chen
[change in existing course—eff. winter 13]

124. Meteorological Instruments and Observations (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 60; Physics SC. Modern meteorological instruments and their use in meteorological observa-
tions and measurements. Both standard and micro-
meteorological instruments are included. GE credit: SciEng | QL, SE, VL—I. (I.) Paw U
[change in existing course—eff. winter 13]

128. Radiation and Satellite Meteorology (4)
Laboratory/discussion—3 hours; extensive problem solving—1 hour. Prerequisite: course 60, Physics 9B, Mathematics 228, 21D. Concepts of atmospheric radiation and the use of satellites in remote sensing. Emphasis on the modification of solar and infrared radiation by the atmosphere. Estimation from satellite data of atmospheric variables such as tempera-
tures and cloudiness. GE credit: SciEng | QL, SE, VL—I. II. (II.) Nathan
[change in existing course—eff. winter 13]

133. Biometeorology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in a biological discipline and Mathemat-
ics 168 or consent of instructor. Atmospheric and biological interactions. Physical and biological basis for water vapor, carbon dioxide and energy exchanges with the atmosphere associated with plants and animals, including humans. Microclimate
of plant canopies and microclimatic modification such as frost scorch and windbreaks. GE credit: SciEng | QL, SE, SL, VL.—II. (II.) Pavu U. Snyder (change in existing course—eff. winter 13)

149. Air Pollution (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 21D, 228, Chemistry 28, Atmospheric Science 121A or Engineering 103. Physical and technical aspects of air pollution. Emphasis on geo-physical processes and air pollution meteorology as well as physical and chemical properties of pollutants. (Same course as Civil and Environmental Engineering 149.) GE credit: SciEng | QL, SE, SL.—I. (I.) Cappo (change in existing course—eff. winter 13)

150. Introduction to Computer Methods in Physical Sciences (P) (4)
Lecture—3 hours; lecture/discussion—2 hours. Prerequisite: Mathematics 228, Physics 9B, and a computer programming course such as Engineering Computer Science 30. Additional courses in fluid dynamics (course 121A or Engineering 103) and in Fourier transforms (Mathematics 11BC or Physics 104A) are helpful, but not required. Computational techniques used in physical sciences. Integral and differential equation numerical solution: mainly finite differencing and spectral (Fourier transform) methods. Time series applications (time permitting). Specific applications drawn from meteorology. Accelerated introduction to FORTRAN including programming assignments. Enrollment limited to 12, preference to Atmospheric Science majors. Offered in alternate years. (P, F/NP grading only.) GE credit: SE.—I. Groljah (change in existing course—eff. winter 13)

158. Boundary-Layer Meteorology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 121A. Dynamics of the atmosphere nearest the Earth’s surface. Friction and heat transfer. Properties of turbulent flows; statistical and spectral techniques; use and interpretation of differential equations. Emphasis on the importance to weather, air pollution, and the world’s oceans. GE credit: SciEng | QL, SE, VL.—II. (II.) Anastasio (change in existing course—eff. winter 13)

160. Introduction to Atmospheric Chemistry (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 28. Quantitative examination of current local, regional and global problems in atmospheric chemistry such as biochemical smog, acid deposition, climate change, and stratospheric ozone depletion] using fundamental concepts from chemistry. Basic chemical modeling of atmospheric reaction systems. GE credit: SciEng | QL, SE, VL.—II. (II.) Anastasio (change in existing course—eff. winter 13)

Avian Science

New and changed courses in Avian Science (AVS)

Lower Division

14L. Management of Captive Birds (2)
Fieldwork—3 hours; lecture/discussion—1 hour. Prerequisite: consent of instructor. One weekly discussion and field trip to study practical captive management (housing, feeding, equipment, market- ing, diseases) of birds such as commercial parrots, hobbyist exotics, raptors, waterfowl, game birds, poultry and pigeons. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

15L. Captive Raptor Management (2)
Laboratory—3 hours; independent study—3 hours; one field trip. Students are taught all of the skills required to handle and care for raptors, including their hus- bandry, biology, habitat requirements, cage design, veterinary care, reproduction methods, potential and long-term care requirements. GE credit: SciEng | SE.—I. (I.) (change in existing course—eff. winter 13)

16LA-16LB-16LC. Raptor Migration and Population Fluctuations (2-2-2)
Fieldwork—3 hours; discussion—1 hour; one Sat- urday field trip. Prerequisite: consent of instructor. Identify raptors; study effects of weather, crops, agri- cultural practices on fluctuations in raptor species and numbers. Familiarize with literature; design a project; survey study sites; collect, computerize, ana- lyze data; compare with previous years. Species, observations, emphasis are different each quarter. GE credit: SciEng | SE.—II. (II.) Klasing (change in existing course—eff. winter 13)

Upper Division

100. Avian Biology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1B, Survey of avian natural history and study of the diversity, function, taxonomy, behavior, ecol- ogy and evolution of birds. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

103. Avian Development and Genomics (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A and 1B, or Biological Sciences 2B. Unique fea- tures of avian development and genomics: Incuba- tion; Egg Structure/Function; Fertilization; Pre-oviposition; Chorioallantoic Membrane; Mortal- ity/Hatching; Genome Organization; Comparative Avian Genomics; Teleromere Biology. Sex Chromo- somes/X-Sex Determination; Advanced Technologies; Genome Manipulation, Mutations. GE credit: SciEng | SE.—I. (I.) Delany (change in existing course—eff. winter 13)

115. Raptor Biology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A or the equivalent. Study of birds of prey: classi- fication, distribution, habits and habitats, migration, unique anatomical and physiological adaptations, natural and captive breeding, health and diseases, environmental stimuli, internal/external consid- erations, rehabilitation, and falconry. Includes two Saturday field trips. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

121. Avian Reproduction (2)
Lecture—2 hours. Prerequisite: Biological Sciences 1A, 1B. Breeding cycles and reproductive strategies, egg and sperm formation, incubation, sexual develop- ment, imprinting, hormonal control of reproduc- tive behavior and song. Species coverage includes wild and companion birds. Course has a physiologi- cal orientation. Offered in alternate years. GE credit: SciEng | SE, SL.—II. (II.) Klasing (change in existing course—eff. winter 13)

203. Advanced Avian Development and Genomics (1)
Discussion—1 hour. Prerequisite: graduate standing, concurrent enrollment in course 103. In consultation with the instructor, students develop a lecture and associated instructional materials, i.e., lesson plan, including justification, reading and presentation and evaluation aids. The topic must complement a topic covered in Avian Sciences 103 (Avian Development and Genomics).—I. (I.) Delany (new course—eff. fall 13)

Graduate

201. Advanced Avian Development and Genomics (5)
Lecture/discussion—3 hours; project—1 hour. Prereq- uisite: course 100 or Evolution and Ecology 137 or Wildlife, Fish, and Conservation Biology 111. Evolution and Ecology, behavior, functional morphology and life-history evolution of birds. Emphasis on the impor- tance of body size as a principle determinant of most aspects of avian performance from lifespan to reproduction and species abundance. Analytical synthesis and critical thinking emphasized. Offered in alternate years. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

Biological Sciences

New and changed courses in Biological Sciences (BIS)

Lower Division

2A. Introduction to Biology: Essentials of Life on Earth (5)
Lecture—3 hours; discussion—2 hours. Essentials of life including sources and use of energy, information storage, responsiveness to natural selection and cell- lularity. Origin of life and influence of living things on the chemistry of the Earth. Not open for credit to students who have completed course 1A with a grade of C- or better. GE credit: SciEng | SE.—I, II, III, (I, II, III) Brit, Comai, Facciotti, Kopp, Roth, Stigter (change in existing course—eff. winter 13)
2B. Introduction to Biology: Principles of Ecology and Evolution (5)
Lecture—3 hours; laboratory—1 hour; laboratory—3 hours. Prerequisite: grade of C- in course 1A or 2A. Introduction to basic principles of ecology and evolutionary biology, focusing on the fundamental mechanisms that underlie and maintain biological diversity across scales ranging from molecules and genes to global processes and patterns. Not open for credit for students who have completed Biological Sciences 1B or 2B or Chemistry 8B or 10 or the equivalent. GE credit: SciEng | QL, QL, SE, SL, VL.—I, II, III. (I, II, III) Grosberg, Keen, Rosenberg, Stachowiak, Strauss (change in existing course—eff. winter 13)

2C. Introduction to Biology: Biodiversity and the Tree of Life (5)
Lecture—4 hours; laboratory—3 hours. Prerequisite: course 1B or 2B completed with a C- or better. Introduction to organizational diversity, using the phylogenetic tree of life as an organizing theme. Lectures and laboratories cover methods of phylogenetic reconstruction, key events in the tree of life, and the evolution of life’s most important and interesting innovations. Not open for credit to students who have completed course 1C with a grade of C- or better. GE credit: SciEng | QL, QL, SE, SL, VL.—I, II, III. (I, II, III) Grosberg, Keen, Rosenberg, Stachowiak, Strauss (change in existing course—eff. winter 13)

Upper Division

102. Structure and Function of Biomolecules (5)
Lecture—3 hours. Prerequisite: course 1A or 2A; Chemistry 8B or 118B or 128B. Structure and function of macromolecules with emphasis on proteins, catalytic activity, enzymes, carbohydrates, lipids, membranes, and proteins as machines. Only one unit of credit for students who have completed Animal Biology 102 & 1.5 units of credit for students who have completed Biological Science 105. GE credit: SciEng | QL, QL, SE—1, II, III. (I, II, III) Cheng, Etzler, Gasser, Hilt, Leary (change in existing course—eff. winter 14)

102Q. Quantitative Biomolecule Concepts (1)
Project—1 hour; autotutorial. Prerequisite: course 102. May be taken concurrently. Study of the conceptual and mathematical models fundamental to biochemistry. Offered irregularly. GE credit: SciEng | QL, SE—Hilt, They (change in existing course—eff. winter 13)

103. Bioenergetics and Metabolism (3)
Lecture—3 hours. Prerequisite: course 1A or 2A; Chemistry 8B or 118B or 128B. Fundamentals of the carbon, nitrogen, and sulfur cycles in nature, including key reactions of biologically important molecules such as carbohydrates, amino acids, lipids, and nucleotides, and of energy production and use in different types of organisms. Principles of metabolic regulation. 1.5 units of credit for student who has completed course 103; 1 unit of credit for student who has completed Animal Biology 103. GE credit: SciEng | SE—Hilt, They (change in existing course—eff. winter 13)

105. Biomolecules and Metabolism (3)
Lecture—3 hours. Prerequisite: courses 1A, 1B, and 1C, or 2A, 2B, and 2C; course 101; Chemistry 8B or 118B or 128B. Fundamentals of biochemical processes, with emphasis on protein structure and activity; energy metabolism; catalysis of sugars, amino acids, and lipids; and gluconeogenesis. One and one half units of credit for students who have completed course 102 or 103. No credit for students who have completed both Animal Biology 102 and 103. GE credit: SciEng | QL, SE—III. (II, III) Fein, Hill, Murphy (change in existing course—eff. winter 14)

122. Population Biology and Ecology (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: courses 1A, 1B, 2A, or 2B, 2C; residence at Bodega Marine Laboratory required. Biological and physical processes affecting plant and animal populations in marine ecosystems. GE credit: SciEng | QL, QL, SE, SL, VL—II, III. (II, III) Harada, Brady, Chan, Dawson, Dinesh-Kumar, Harada, Karl, Maloof (change in existing course—eff. winter 13)

122P. Population Biology and Ecology/Advanced Laboratory Topics (5)
Lecture—12 hours; discussion—1 hour. Prerequisite: course 122 concurrently. Residence at Bodega Marine Laboratory required. Training in scientific research, from hypothesis testing to publication, including methods of library research. Research related to topics covered in course 122. Final presentation required. Students participating in the Bodega Marine Laboratory Program. GE credit: SciEng | SE, VL, WE—III. (III) Chang, Cherr, Morgan (change in existing course—eff. winter 13)

124. Coastal Marine Research (3)
Lecture—6 hours; fieldwork—6 hours; laboratory/discussion—1 hour. Prerequisite: upper division standing or concurrent enrollment in at least one course from Environmental Science and Policy 124, 152, Evolution and Ecology 106, 110, 114; residence at or near Bodega Marine Lab required. Student must complete the application available at http://www.bml.ucdavis.edu. Independent research on topics related to the accompanying core Bodega Marine Laboratory summer courses. Students will select one instructor to be primary mentor, but integrative topics that draw on the expertise of several BML faculty members will be encouraged. May be repeated twice for credit. GE credit: SciEng | QL, QL, SE, VL, WE—IV. (IV) Gaylord, Hill, Largier, Morgan, Sanford (change in existing course—eff. winter 13)

132. Introduction to Dynamic Models in Modern Biology (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: Mathematics 16C, Statistics 13, lower division course in biology required. Dynamic modeling in the biological sciences, including matrix models, difference equations, differential equations, and complex dynamics. Examples include classic models in ecology, cell biology, physiology, and neurosciences. Emphasis on understanding models, their assumptions, and implications for modern biology. GE credit: SciEng, Wrt | QL, QL, SE, SL, VL, WE—II. (II) Hom (change in existing course—eff. winter 13)

133. Collaborative Studies in Mathematical Biology (3)
Lecture/discussion—3 hours. Prerequisite: Mathematics 16ABC or the equivalent, one course from course 1A, 1B, 1C, 2A, 2B, 2C or the equivalent in biology, consent of instructor. Interdisciplinary research and historicizing using mathematics and computation to solve current problems in biology. Not offered every year. May be repeated six times for credit. GE credit: SciEng | QL, QL, SE, SL, VL, WE—II, III, III, (I, II, III) Grossberg, Schreiber (change in existing course—eff. winter 13)

134. Systems Biology: From Biological Circuits to Biological Systems (2)
Lecture/discussion—2 hours; term paper. Prerequisite: course 101 and one course from Molecular and Cellular Biology 121, 161 or Plant Biology 113, Mathematics 16ABC or 17ABC, or consent of instructor. Applying systems theory to understand the properties of biological networks in a variety of model organisms. Emphasis on both local biological circuits, and genome-scale biological networks. Topics include network motifs, robustness, modeling, emergent properties and integration of networks. GE credit: SciEng | QL, QL, SE, VL—II, III. (II) Brady (change in existing course—eff. winter 13)

180L. Genomics Laboratory (5)
Lecture—2 hours; laboratory—6 hours; discussion—1 hour. Prerequisite: course 181; course 183 may be taken concurrently. Molecular and Cellular Biology 182. Computational approaches to model and analyze biological information about genomes, transcriptomes, and proteomes. Topics include genome assembly and annotation, RNA and small RNA profiling, proteomics, protein-DNA and protein-protein interactions, network analysis, and comparative genomics. Computer programming experience not required. Students who have received credit for taking Computer Science Engineering 124 or Biotechnology 150 will receive 3 units for completing course 180L. GE credit: SciEng | QL, QL, SE, VL—II, III. (II) Brady, Chan, Dawson, Dinesh-Kumar, Harada, Karl, Maloof (change in existing course—eff. spring 13)

181. Comparative Genomics (3)
Lecture—3 hours. Prerequisite: course 101. Comparisons of genomes at the population and species level. Genomic techniques for mapping disease (and other) genes, recombination, evolution and migration patterns, determination of gene function, prediction of organismal traits, and metagenomics: determination of community composition and function. GE credit: SciEng | QL, QL, SE—I. (I) Dawson, Maloof (change in existing course—eff. winter 13)

194H. Research Honors (2)
Independent study—6 hours. Prerequisite: senior standing. Students majoring in Biological Sciences who have completed two quarters (3-5 units per quarter) of 199 and who qualify for the honors program as defined by the department. Opportunity for Biological Sciences majors to pursue intensive research culminating in the writing of a senior thesis with the guidance of faculty advisers. (P/NP grading only) GE credit: SE, VL (change in existing course—eff. winter 13)

Biotechnology

New and changed courses in Biotechnology (BIT)

Upper Division

150. Applied Bioinformatics (4)
Lecture—2 hours; laboratory/discussion—2 hours. Prerequisite: Computer Science Engineering 110 or 15 or Plant Sciences 21; Biological Sciences 101 and 104; Plant Sciences 120 or Statistics 13 or Statistics 100. Concepts and programs needed to apply bioinformatics in biotechnology research. Sequence analysis and annotation and use of plant and animal databases for students in biological and agricultural sciences. Limited enrollment. 3 units for students who have completed Computer Science Engineering 124. GE credit: SciEng | SE, VL (change in existing course—eff. winter 13)

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2013-2014 offering in parentheses
Pre-Fall 2011 General Education (GE): Art&Humanities;Sci&Eng;Science&Engineering;Socialsciences;Div=DominantDiversity;Wrt=WritingExperience
Fall 2011 and on General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; ACGH=American Cultures; DD=Dominant Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; VL=World Cultures; WE=Writing Experience
160. Principles of Plant Biotechnology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A or 2A; Biological Sciences 101 or Plant Sciences 152. Principles and concepts of plant biotechnology including recombinant DNA technology, molecular biology, genomics, and cell and tissue culture, gene transfer and crop improvement strategies using transgenic crops. Not open for credit to students who have completed Plant Biology 160. [Former course Plant Biology 160.] GE credit: SciEng | SE.—II. (II.) Dandekar
(change in existing course—eff. winter 13)

161A. Genetics and Biotechnology Laboratory (6)
Lecture—3 hours; laboratory—9 hours. Prerequisite: Plant Sciences 152 or Biological Sciences 101; consent of instructor. Techniques of genetic analysis at the molecular level including recombinant DNA, gene mapping and basic computational biology. Not open for credit to students who have completed Plant biology 161A. GE credit: SciEng | SE.—II. (II.) Beckles
(change in existing course—eff. winter 13)

161B. Plant Genetics and Biotechnology Laboratory (6)
Lecture—1 hours; laboratory—8 hours. Prerequisite: Plant Sciences 152 or Biological Sciences 101; consent of instructor. Advanced techniques of genetic analysis at the molecular and cellular levels, including transfection, gene expression analysis and transgenic plants. Not open for credit to students who have taken Plant Biology 161B. [Former course Plant Biology 161B.] GE credit: SciEng | SE, SL.—III. (III.) Bennett, Blumwald
(change in existing course—eff. winter 13)

171. Professionalism and Ethics in Genomics and Biotechnology (3)
Lecture—1 hour; discussion—2 hours. Prerequisite: upper division standing in a natural science major. Real and hypothetical case studies to illustrate ethical issues in genomics and biotechnology. Training and practice in difficult ethical situations and evaluation of personal and social consequences. GE credit: SciEng | SE, SL, WE.—I, II, III. (II, III) Bennett, Bradford, Yoder
(change in existing course—eff. winter 13)

188. Undergraduate Research Proposal (3)
(change in existing course—eff. winter 13)

194H. Honors Thesis in Biotechnology (1-5)
Independent Study—3-15 hours. Prerequisite: senior standing in Biotechnology with 3.50 GPA or higher and completion of courses 188 and 189L. Independent study of selected topics under the direction of a member or members of the staff. Completion will involve the writing of a senior thesis. (Deferred grading only, pending completion of sequence.) [P/NP grading only.] GE credit: SE, WE.
(change in existing course—eff. winter 13)

Chemistry

New and changed courses in Chemistry (CHE)

Upper Division

105. Analytical and Physical Chemical Methods (4)
(change in existing course—eff. winter 13)

110A. Physical Chemistry: Introduction to Quantum Mechanics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2C, Mathematics 16C or 21C; one year of college physics. Introduction to the postulates and general principles of quantum mechanics. Approaches based on variational method and time independent perturbation theory. Application to harmonic oscillator, rigid rotor, one-electron and many-electron atoms, and homonuclear and heteronuclear diatomic molecules. GE credit: SciEng | QL, SE.—I, III. (I, III)
(change in existing course—eff. winter 13)

110B. Analytical Chemistry (4)
(change in existing course—eff. winter 13)

125. Advanced Methods in Physical Chemistry (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 110C (may be taken concurrently) and 115. Advanced theoretical and laboratory techniques in analytical and physical chemistry. Advanced spectroscopic methods. Thermodynamics. Kinetics. Chemical literature. Digital electronics and computer interfacing. Laboratory measurements and vacuum techniques. GE credit: SciEng, Wrt | QL, SE, WE.—II, III. (II, III)
(change in existing course—eff. winter 13)

130C. Case Studies in Pharmaceutical Chemistry (1)
Seminar—2 hours; independent study. Prerequisite: courses 130A and 130B concurrently. Seminar. Exploration of medicinal and pharmaceutical chemistry topics through seminars presented by professional chemists (and allied professionals). Designed to highlight and improve understanding of the pharmaceutical sciences of a student with a degree in pharmaceutical chemistry. (P/NP grading only.)—I, III. (I, III)
(new course—eff. fall 13)

Graduate

245. Mechanistic Enzymology (3)
Lecture—3 hours. Advanced topics in chemical kinetics relevant to enzymes, enzyme kinetics, theory of enzyme catalysis, and the analysis of a selection of organic enzyme reaction mechanisms by the tools introduced in the first part of the course. —I. (I) Toney
(new course—eff. fall 13)

Chicana/Chicano Studies

New and changed courses in Chicana/Chicano Studies (CHI)

Upper Division

113. Latin American Women's Engagement in Social Movements (4)
Lecture/discussion—3 hours; term paper. Examination of how women of different racial/ethnic and class backgrounds in Latin America challenge their marginalization. Exploration of US foreign policy, its effects on Latin American’s institutions and on Latin American citizens. Using Chicana feminist perspectives. Offered in alternate years. GE credit: SocSci | ACGH, DD, SS, WC, WE.—III. Deeb-Sossa
(new course—eff. fall 13)

114. Women of Color Reproductive Health and Reproductive Politics in a Global Perspective (4)
Lecture/discussion—3 hours; term paper. Study contemporary issues in reproductive health and reproductive politics, both globally and in the U.S., for women of color. Offered in alternate years. GE credit: SocSci | ACGH, DD, SS, WC, WE.—III. Deeb-Sossa
(new course—eff. fall 13)

117. Chicana and Chicano Narrative (4)
Lecture/discussion—3 hours; term paper. Exploration of contemporary forms of the Chicana and Chicano narrative, encompassing visual art, fiction, poetry, film, theater, and creative nonfiction. Exposure to a variety of artists and scholars whose work shapes our evolving understanding of the Chicana/o experience. GE credit: ArtHum | ACGH, AH, DD, VL, WC. WE.—II, III. (II, III.) Montoya
(new course—eff. fall 13)

117. Mexican and Chicano Mural Workshop (4)
Studio—8 hours; independent study—1 hour. Prerequisite: course 70 and/or written consent of instructor. The Mural: a collective art process that empowers students and people through design and execution of mural paintings in the tradition of the Mexican Mural Movement; introduces materials and techniques. May be repeated one time for credit. [Same course as Art Studio 171.] GE credit: ArtHum | ACGH, AH, VL, WC, WE.—II, III. (II, III.) Jackson, M. Montoya
(change in existing course—eff. winter 13)

184. Latina/o Youth Gangs in Global Perspective (4)
Lecture—3 hours; term paper. Comparative analysis of Latina/o youth gangs in Europe, Latin America, and the United States. Social, economic, political, and cultural factors leading to youth gangs as well as the responses are considered within a global perspective. Not open for credit to students who have completed course 184S. Offered in alternate years. GE credit: SocSci | ACGH, DD, DL, SS, WC, WE.—II. (II.) Chavez-Garcia
(new course—eff. fall 13)

184S. Latino Youth Gangs in Global Perspective (4)
Lecture—2 hours. Comparative analysis of Latino youth gangs in Europe, Latin America, and the United States. Social, economic, political, and cultural factors leading to youth gangs as well as the responses are considered within a global perspective. Not open for credit to students who have completed course 184S. Offered in alternate years. GE credit: SocSci | ACGH, DD, DL, SS, WC, WE.—II. (II.) Chavez-Garcia
(new course—eff. summer 13)
### Chinese

**New and changed courses in Chinese (CHN)**

#### Upper Division

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>110. Chinese Film (4)</td>
<td>Lecture/discussion—3 hours; film viewing—3 hours.</td>
<td>Prerequisite: History 9A or any course on a traditional China; upper division standing. English language survey of Chinese film, from its inception to the end of the twentieth century. Chinese films as important texts for understanding national, transnational, racial, gender, and class politics of modern China.</td>
<td>(new course—eff. winter 13)</td>
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<tr>
<td>114. Continues course 114 by reading selections from the Records of the Grand Historian and other early, influential works. GE credit. ArtHum</td>
<td></td>
<td>(change in existing course—eff. winter 13)</td>
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<tr>
<td>120. Advanced Chinese (4)</td>
<td>Lecture—3 hours; discussion—1 hour.</td>
<td>Prerequisite: course 113 or consent of instructor. Selected readings from all genres to develop advanced skills in reading, writing, aural comprehension, and translation. May be repeated one time for credit. GE credit. ArtHum</td>
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<tr>
<td>130. Readings in Traditional Chinese Fiction (4)</td>
<td>Lecture—1 hour; discussion—3 hours.</td>
<td>Prerequisite: course 112 or the equivalent; course 114 recommended. Close reading in Chinese of representative works from the Tang Dynasty (618-907) to modern times. May be repeated one time for credit when content varies. GE credit. ArtHum</td>
<td></td>
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<tr>
<td>111A. Intensive Third-Year Chinese (12)</td>
<td>Lecture/discussion—13.3 hours. Prerequisite: course 6 or 3BL or 4A, or successful completion of Chinese Placement Exam and with placement at the third-year level. Not open to students who have completed course 111, 112, or 113. Nine-week intensive summer course combines courses 111, 112, and 113. Training at intermediate-high and advanced-low level in spoken and written Chinese in cultural and communicative contexts based on language skills developed in course 6. GE credit. ArtHum</td>
<td></td>
<td>(change in existing course—eff. winter 13)</td>
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<tr>
<td>112. Modern Chinese: Reading and Discussion (4)</td>
<td>Lecture—3 hours; discussion—1 hour.</td>
<td>Prerequisite: course 6 or the equivalent. Readings in modern Chinese newspaper articles, essays, and short stories, based on language skills developed in courses 1 through 6. GE credit. ArtHum</td>
<td>AH, WC.</td>
</tr>
<tr>
<td>132. Readings in Modern Chinese Poetry (4)</td>
<td>Lecture—3 hours; discussion—1 hour.</td>
<td>Prerequisite: course 6 or consent of instructor. Traditional Chinese poetry from its beginnings to the golden ages of Tang and Song, surveying forms and poets that best reveal the Chinese poetic sensibility and the genius of the language of Chinese poetry. GE credit. ArtHum</td>
<td>AH.</td>
</tr>
<tr>
<td>115. Introduction to Classical Chinese: Narrative Styles (4)</td>
<td>Lecture—3 hours; discussion—1 hour.</td>
<td>Prerequisite: course 115. Continues course 115 by reading selections from the Records of the Grand Historian and other early, influential works. GE credit. ArtHum</td>
<td>AH, WC.</td>
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### Cinema & Technocultural Studies

**New and changed courses in Cinema & Technocultural Studies (CTS)**

#### Lower Division

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<tr>
<td>110. Introduction to Media Computation (4)</td>
<td>Lecture—3 hours; discussion/laboratory—1 hour.</td>
<td>Introduction to key computational ideas necessary to understand and produce digital media. Fundamentals of programming are covered as well as analysis of how media are represented and transmitted in digital form. Aimed primarily at non-computer science students. [Same course as Engineering: Computer Science 012.] GE credit: ArtHum or SciEng</td>
<td>AH or SE, VL.</td>
</tr>
<tr>
<td>116. Design on Screen (4)</td>
<td>Lecture/discussion—3 hours; film viewing—2 hours. Analysis of the contribution of outstanding designers for cinema, television and film entertainment. Study of diverse aesthetic theories of production design and art direction, costume design, or cinematoography. Introductory principles and practice, history. May be repeated two times for credit when topic differs.</td>
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<tr>
<td>124E. Costume Design for Film (4)</td>
<td>Lecture/discussion—4 hours. Prerequisite: for Drama Art majors; Dramatic Art 24 or 124D or consent of instructor. Theory and practice of the art and business of film costume design. Script analysis, costume research, developing design concepts, budgeting, and current production practices and methods.</td>
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### Upper Division

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<tbody>
<tr>
<td>116A. Modern Iranian Cinema (4)</td>
<td>Lecture/discussion—3 hours; film viewing—3 hours.</td>
<td>Prerequisite: upper-division standing, or consent of instructor. Iranian cinema of the 20th century in the context of profound cultural and social changes in Iran especially since the Iranian Revolution. Productions by representative directors such as Kiarostami, Makhmalbaf, Bahram Beizaie are included. Knowledge of Persian not required. Offered in alternate years.</td>
<td>Same course as Middle East/South Asia Studies 131A.</td>
</tr>
</tbody>
</table>
147A. Chinese Film (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: GE credit: ACH or any course on traditional Chinese; upper division standing. English language survey of Chinese film, from its inception to the end of the twentieth century. Chinese films as important texts for understanding national, transnational, racial, gender, and class politics of modern China. [Same course as Chinese 101.] GE credit: ACH, Div | AH, VL, WC.—Ill. (Ill.) Chen [new course—eff. winter 14]

174. Acting for Camera (4)
Lecture/lab—6 hours. Prerequisite: consent of instructor. Analysis and practice of acting skills required for camera work and digital media. May be repeated eight times for credit when different instructor is assigned. [Same course as Drama 174.—III. (III.) Anderson, Merlin [new course—spring 13]

Classics

New and changed courses in Classics (CLA)

Lower Division

15. Women in Classical Antiquity (4)
Lecture/discussion—3 hours; term paper. Lives and roles of women and men in ancient Greece and Rome. Readings from history, philosophy, medical and legal documents, literature and myth. Offered irregularly. GE credit: ACH | AH, VL, WC, WE.—Seal [change in existing course—eff. winter 13]

30. Greek and Latin Elements in English Vocabulary (3)
Lecture—3 hours. Knowledge of Latin and Greek not required. Elements of Greek and Latin vocabulary for increased understanding of English word formation and improved ability to understand and retain unfamiliar words. Emphasis on Greek and Latin elements but other languages not neglected. GE credit: ACH | AH.—II. (III.) Albu, Popescu, Rundin [change in existing course—eff. winter 13]

31. Greek and Latin Elements in Technical Vocabulary (3)
Lecture—3 hours. Knowledge of Greek and Latin not required. Elements of Greek and Latin vocabulary to increase understanding of English word formation in medical, scientific and technical terminology and improve ability to understand and retain unfamiliar terms. GE credit: ACH | AH [change in existing course—eff. winter 13]

Upper Division

101A. Topics in Ancient Mediterranean Civilizations (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in Classics, Latin or Greek or consent of instructor. Topics may be ordered by time or place (e.g. Hellenistic Egypt) or by theme or genre (e.g. social history in the Roman Empire), or by the order of instruction. May be repeated two times for credit when topic differs. Offered irregularly. GE credit: ACH | AH, WC, WE.—Albu [change in existing course—eff. winter 13]

101B. Topics in Greek Civilization (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in Classics, Latin, or Greek or consent of instructor. Topics may be ordered by time or place (e.g. the world of Homer) or by theme or genre (e.g. the Greek art of war). May be repeated two times for credit when topic differs. Offered irregularly. GE credit: ACH | AH, WC, WE.—Albu [change in existing course—eff. winter 13]

101C. Topics in Roman Civilization (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in Classics or consent of instructor. Topics in classical reception from late antiquity to the present. Topics may be ordered by time or place (e.g. the classical tradition in Washington, D.C.) or by theme or genre (e.g. cinematic representations of the ancient world). May be repeated two times for credit when topic differs. Offered irregularly. GE credit: ACH | AH, WC, WE.—Albu [change in existing course—eff. winter 13]

101D. Topics in Classical Receptions (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in Classics or consent of instructor. Topics in classical reception from late antiquity to the present. Topics may be ordered by time or place (e.g. the classical tradition in Washington, D.C.) or by theme or genre (e.g. cinematic representations of the ancient world). May be repeated two times for credit when topic differs. Offered irregularly. GE credit: ACH | AH, WC, WE.—Albu [change in existing course—eff. winter 13]

120. Greek and Roman Historiography (4)
Lecture/discussion—3 hours; term paper. Survey of Greek and Roman historical writing in English translation. Authors to be included: Herodotus, Thucydides, Sallust, Livy, and Tacitus. Focus on the development of historical writing as a literary genre. GE credit: ACH | AH, WC, WE. Offered in alternate years.—Seal [change in existing course—eff. winter 13]

125. Roman Political Thought (4)
Lecture—3 hours; term paper. Survey of Roman thinking about politics, as expressed both in formal theorizing and in a variety of other contexts, including oratory, historiography, and epic. Study of Roman political reflection in its historical, cultural, and literary context. GE credit: ACH | AH, WC, WE. Offered in alternate years.—Seal [change in existing course—eff. winter 13]

150. Socrates and Classical Athens (4)
Lecture/discussion—3 hours; term paper. Study of the major sources of our knowledge of Socrates, assessment of his role in the politics and culture of ancient Athens, his method of teaching, and his place in Western thought. Offered in alternate years. GE credit: ACH | AH, WC, WE.—Seal [change in existing course—eff. winter 13]

172A. Early Greek Art and Architecture (4)
Lecture—3 hours; term paper. Examination of the origin and development of the major monuments of Greek art and architecture from the eighth century to the mid-fifth century B.C. Not open for credit to students who have completed Art History 154A. [Same course as Art History 172A.] Offered in alternate years. credit: ACH | AH, VL, WC, WE.—Roller [change in existing course—eff. fall 11]

172B. Later Greek Art and Architecture (4)
Lecture—3 hours; term paper. Study of the art and architecture of later Classical and Hellenistic Greece, from the mid-fifth century to the first century B.C. Not open for credit to students who have completed Art History 154B. [Same course as Art History 172B.] Offered in alternate years. GE credit: ACH, Wrt | AH, VL, WC, WE.—(II.) Roller [change in existing course—eff. fall 11]

173. Roman Art and Architecture (4)
Lecture—3 hours; term paper. The art and architecture of Rome and the Roman Empire, from the founding of Rome through the fourth century C.E. Not open for credit to students who have completed Art History 155. [Same course as Art History 173.] Offered in alternate years. GE credit: ACH, Wrt | AH, VL, WC, WE.—(II.) Roller [change in existing course—eff. fall 11]

175. Architecture and Urbanism in Mediterranean Antiquity (4)
Lecture—3 hours; extensive writing. Prerequisite: a lower division course (except 30, 31); Art History 1A recommended. Architecture and urban development in the ancient Near East, Greece, and Rome. Special emphasis on the social structure of the ancient city as expressed in its architecture, and on the interaction between local traditions and the impact of Greek-Roman urbanism. [Same course as Art History 175.] Offered in alternate years. GE credit: ACH, Div, Wrt | AH, VL, WC, WE.—(II.) Roller [change in existing course—eff. fall 11]

194HA-194HB. Special Study for Honors Students (3-3)
Discussion—1 hour; independent study; term paper. Prerequisite: admission to the honors program and consent of faculty member supervising honors thesis. Directed reading, research and writing culminating in the completion of a senior honors thesis under the direction of a faculty advisor. (Deferred grading only, pending completion of sequence. P/NP grading only.) GE credit: AH.—III, III. [change in existing course—eff. winter 13]

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III. (III.) Goldkorn [new course—eff. fall 12]

Clinical Research

New and changed courses in Clinical Research (CLH)

Graduate

233. Molecular Mechanisms of Disease: Cancer (3)
Lecture/discussion—2 hours; project—3 hours. Prerequisite: consent of instructor. Restricted to students pursuing the designated emphasis in Translational Research: graduate standing. Cutting edge of research on underlying mechanisms of cancer development, progression and prevention - clinical trials, drug development, signaling pathways and molecular mechanisms of cancer development, recent basic research on cancer stem cells, genetics and epigenetic events and animal models. [Same course as Research 233.] [change in existing course—eff. fall 13]

Communication

New and changed courses in Communication (CMN)

Lower Division

3. Interpersonal Communication Competence (4)

5. Global English and Communication (4)
Lecture—2 hours; discussion—2 hours. English as a global language and its uses in intercultural communication. Cultural, historical, and political dimensions of varieties of English spoken around the world. GE credit: ACH, Div, Dom, Dom—(II.) O’Keeffe [new course—spring 13]
Community and Regional Development

New and changed courses in Community and Regional Development (CRD)

Upper Division

156. Community Economic Development (5)
Lecture—4 hours; laboratory—2 hours. Prerequisite: Plant Sciences 21 or Engineering Computer Sciences 15 and course 152 or consent of instructor. How low income communities work together to improve their economic well-being, increase their control over their economic lives, and build community power and decision-making. Includes techniques to analyze community capacity and identification of appropriate intervention tools. Group project. GE credit: SocSci | QL, SS, WE.—II, III. [II] Hirtz
(change in existing course—eff. winter 13)

164. Theories of Organizations and Their Roles in Community Change (5)
Lecture—4 hours; laboratory—2 hours. Prerequisite: course 1 or 2 or equivalent Social science course and Statistics 13 or equivalent. Planned change within and through community organizations. Private voluntary organizations, local community associations, and local government. Relationship between community organizations and social capital. Collaborative original data gathering and professional report writing. GE credit: SocSci | ACGH, DD, OL, SS, VI, WE.—II, III. [II] Hirz
(change in existing course—eff. winter 13)

197T. Tutoring in Community and Regional Development (1-3)
Tutorial—3-15 hours. Prerequisite: upper division tutoring; completion of course to be tutored; consent of instructor. Assisting instructor in one of the Community and Regional Development’s regular courses by tutoring individual students or small groups of students in a laboratory, in voluntary discussion groups, or other voluntary activities. May be repeated up to 10 units for credit. Offered irregularly. (P/NP grading only)—I, II, III, IV. [I, II, III, IV] (new course—eff. fall 13)

Graduate

240. Community Development Theory (4)
Lecture/discussion—4 hours. Introduction to theories of community development and different concepts of poverty, community, and development. Emphasis on building theory, linking applied development techniques and theoretical development policy, and examining case studies of community development organizations and projects. [Same course as Geog 240.]—I. [I]
(change in existing course—eff. winter 14)

244. Political Ecology of Community Development (4)
Lecture—4 hours. Prerequisite: graduate standing. Community development from the perspective of geographical political ecology. Social and environmental outcomes of the dynamic relationship between communities and land-based resources, and between social groups and uses of community conservation and development in developing and industrialized countries. [Same course as Geog 254.]—II. [II] Galt
(change in existing course—eff. winter 14)

246. The Political Economy of Transnational Migration (4)
Lecture—4 hours. Prerequisite: graduate standing. Theoretical perspectives and empirical research on social, cultural, political, and economic processes of transnational migration to the U.S. Discussion of conventional theories will precede contemporary comparative perspectives on class, race, ethnicity, citizenship, and the ethnic economy. [Same course as Geography 246.]—I, II. [II] Guarnizo
(change in existing course—eff. winter 14)

248. Social Policy, Welfare Theories and Communities (4)
Seminar—4 hours. Prerequisite: graduate standing. Theories and comparative histories of modern welfare states and social policy in relation to legal/normative, organizational, and administrative projects. Analysis of specific social issues within the U.S./California context. Not open for credit to students having completed Community & Regional Development 248A and 248B. [Same course as Geography 248.] Offered in alternate years.—III. Hirz
(change in existing course—eff. fall 13)

Comparative Literature

New and changed courses in Comparative Literature (COM)

Upper Division

138. Gender and Interpretation in the Renaissance (4)
Lecture/discussion—3 hours; term paper. Prerequisite: completion of Subject A requirement, at least one course in literature, or consent of instructor. Critical analysis of Renaissance texts with primary focus on issues such as human dignity, education and gender politics; “high” and “low” culture and its relation to literary practices. [Same course as Italian 141.] GE credit: ArtHum, Div, Wrt | AH, WC, WE.—II, III. [II] Schiessar
(change in existing course—eff. fall 11)

139. Shakespeare and the Classical World (4)
Lecture/discussion—3 hours; term paper. Prerequisite: at least one course in literature. Shakespeare’s representations of the classical world in the light of selected ancient texts and Renaissance conceptions of antiquity, with special attention to the depiction of politics and history. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—II, III.
(change in existing course—eff. winter 13)

141. Introduction to Comparative Critical Theory (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one upper division literature course and consent of instructor. Introduction to comparative critical theory and its use for interpreting literary texts, film, and media forms in global culture. [Same course as Critical Theory 101.] GE credit: ArtHum, Wrt | AH, WC, WE.—II, III. [II] Larsen
(change in existing course—eff. fall 11)

142. Critical Reading and Analysis (4)
Lecture/discussion—3 hours; term paper. Prerequisite: consent of instructor. Close reading of selected texts; scrutiny of very limited amount of material, with attention to the problem of texts in translation. GE credit: ArtHum | AH, WC, WE.
(change in existing course—eff. winter 13)

194H. Special Study for Honors Students (1-5)
Independent study—1-5 hours. Prerequisite: open only to majors of senior standing who qualify for honors program. Guided research, under the direction of a faculty member and out of the Program Director, leading to a senior honors thesis on a comparative topic. May be repeated for credit. (P/NP grading only.) GE credit: AH, WE.
(change in existing course—eff. winter 13)
Critical Theory

New and changed courses in Critical Theory (CT)

Upper Division

101. Introduction to Critical Theoretical Approaches to Literature and Culture (4)
Lecture/discussion—3 hours, term paper. Prerequisite: one upper division literature course or consent of instructor. Introduction to critical theory and its use for interpreting literary texts, film, and media forms in our present global culture. (Same course as Comparative Literature 141.) GE credit: ArtHum, Wrt | AH, WE.—III. (III.) (change in existing course—fall 13)

13. Photography for Designers (4)
Lecture—5 hours; lecture/discussion—2 hours. Prerequisite: course 1; students with a background in drawing or Advanced Placement Art Studio units are encouraged to submit a portfolio for review to waive this course. Priority given to Design majors. Photography for designers with emphasis on 35mm camera photography, black and white processes, and darkroom techniques. Digital photography, critical analysis of photographs, and the role of photography in society. GE credit: ArtHum | AH, VL.—IV. (IV.) (change in existing course—fall 12)

14. Design Drawing (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1; students with a background in drawing or Advanced Placement Art Studio units are encouraged to submit a portfolio for review to waive this course. Priority given to Design majors. Drawing as a tool for basic design. Basic skills in objective observation and representation, including line, shape, tone, and space. Drawing as a tool for formulating and working through design problems. GE credit: ArtHum | AH, VL.—IV. (IV.) (change in existing course—fall 13)

Cultural Studies

New and changed courses in Cultural Studies (CST)

Graduate

210. Memory, Culture, and Human Rights (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Restricted to graduate students. Explores the multiple convergences among memory, culture, and human rights. Discusses diverse approaches to how societal actors in different historical, cultural, and national settings, construct meanings of past political violence, inter-group conflicts, and human rights struggles. (Same course as Human Rights 8008.) Offered in alternate years. —I. Lazzara (new course—fall 13)

Davis Honors Challenge

New and changed courses in Davis Honors Challenge (HNR)

Lower Division

94. Honors Seminar (4)
Seminar—4 hours. Open to students in the Davis Honors Challenge. Collaborative, multidisciplinary exploration of complex contemporary problems. Focus on critical thinking and analytical interpretation, on oral and written communication, and on the use of electronic media in gathering information. May be repeated for credit. GE credit: Wrt | WE.—I, II, III, (I, II, III) (change in existing course—fall 13)

Design

New and changed courses in Design (DES)

Lower Division

1. Introduction to Design (4)
Lecture—3 hours; discussion—1 hour. Priority given to Design majors. Introduction to Design as a discipline and distinguish it from other literary disciplines. Required for the major. GE credit: ArtHum | AH, WE.—III. (III.) (change in existing course—fall 13)

13. Photography for Designers (4)
Lecture—5 hours; lecture/discussion—2 hours. Prerequisite: course 1; students with a background in drawing or Advanced Placement Art Studio units are encouraged to submit a portfolio for review to waive this course. Priority given to Design majors. Photography for designers with emphasis on 35mm camera photography, black and white processes, and darkroom techniques. Digital photography, critical analysis of photographs, and the role of photography in society. GE credit: ArtHum | AH, VL.—IV. (IV.) (change in existing course—fall 12)

14. Design Drawing (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1; students with a background in drawing or Advanced Placement Art Studio units are encouraged to submit a portfolio for review to waive this course. Priority given to Design majors. Drawing as a tool for basic design. Basic skills in objective observation and representation, including line, shape, tone, and space. Drawing as a tool for formulating and working through design problems. GE credit: ArtHum | AH, VL.—IV. (IV.) (change in existing course—fall 13)

16. Graphic Design and Computer Technology (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1. Priority given to Design students. Introduction to digital tools with emphasis on graphic design including theory, practice and technology. Includes principles of color, resolution, pixels, vectors, image enhancement, layout, visual organization, visual hierarchy, typography. GE credit: ArtHum | AH, VL.—I, II, III, IV. (I, II, III, IV.) (change in existing course—fall 13)

21. Drafting and Perspective (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16 or consent of instructor. Priority given to Design majors. Introduction to mechanical drafting, including scaled drawing, orthogonal projection, isometric, axonometric and perspective. Includes basic rendering techniques. GE credit: ArtHum | AH, VL.—I, II, IV. (I, IV.) (change in existing course—fall 13)

31. Photography for Designers (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16 or consent of instructor. Pass One priority given to Design majors. Visual communication and digital imaging techniques using black and white, and color. Critical analysis of photographic theory and the role of photography in society combining theoretical perspectives with practical applications. Explore use and meaning of single, sequence, and single composite images. GE credit: ArtHum | AH, VL.—I, II, III, (I, II, III.) (change in existing course—fall 13)

40A. Energy, Materials, and Design Over Time (4)
Lecture/discussion—3 hours, term paper. Priority to Design majors. Global history of design across time viewed through the lens of the effects of the creation and discovery of new energy sources, processes and materials on design. Not open for credit to students who have taken course 40 or 140. GE credit: ArtHum | AH, DD, VL, WE.—I. (I.) Cogdell (change in existing course—fall 13)

40B. Ideologies of Design (4)
Lecture—3 hours; term paper. Prerequisite: course 1; course 40A or art history (ancient through 19th century) recommended or consent of instructor. Priority given to Design majors. Major historical and theory of design in particular relation to political, philosophical, cultural, economic, and environmental debates and objectives. GE credit: ArtHum | AH, WE.—I, II, III, (I, II, III.) (change in existing course—fall 13)

40C. Design for Aesthetics and Experience (4)
Lecture/discussion—3 hours; term paper. Priority to Design majors. Global historical survey of design’s engagement with changing notions of aesthetics and experience. Relates transformations in the theory, production, and reception of all aspects of design (objects, landscapes, architectures, etc.) to larger cultural, social, and political contexts. Not open for credit to students who have taken course 40 or 140. GE credit: ArtHum | AH, DD, WE.—I, II, III, (I, II, III.) (Housefield (new course—fall 13)

50. Introduction to Three-Dimensional Design (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1; course 16 recommended or consent of instructor. Priority to Design majors. Introduction to Design concept development and detailing as it relates to the making of objects, structures and models using form, scale and materials. Product design and rapid prototyping methods using a range of techniques for advancing the design process. GE credit: ArtHum | AH, VL.—IV. (IV.) Kessler (change in existing course—fall 13)

60. Introduction to Surface Design (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16 or consent of instructor. Priority to Design majors. Introduction to diverse methods for creating imagery, patterns, and textures on cloth. Explorations and experimentation with dyes and pigments, mechanical resists, color removing, and physical and chemical alterations of textile surfaces and structures. Offered irregularly. GE credit: ArtHum | AH, VL.—IV. (IV.) Housefield (change in existing course—fall 13)

70. Introduction to Textile Design Structures (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16 or consent of instructor. Priority to Design majors. Introduction to diverse methods for creating textile structures. Exploration of the creative potential of hand-woven textiles, manipulation of fabric to create dimensional surfaces, and the basics of building and joining fabric structures. Only two units of credit to students who have completed courses 23 or 24. Not open for credit to students who have completed both 23 and 24. GE credit: ArtHum | AH, VL.—I. (I.) Savageau (change in existing course—fall 13)
77. Introduction to Structural Design for Fashion (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16 or consent of instructor. Priority given to Design majors. Study and practice of designing clothing for the human body. Emphasis on flat pattern development, structural joining sequences and the development of three-dimensional garments from two-dimensional drawings. Not open for credit to students who have completed course 65. GE credit: AHC, VLL.—II. (Ill.) Savageau  
(change in existing course—eff. spring 13)

Upper Division

107. Advanced Structural Design for Fashion (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16 or consent of instructor. Priority given to Design majors. Study and practice of designing clothing for the human body through pattern development and structural joining. Emphasis on draping techniques and advanced conceptualization for fashion design. Not open for credit to students who have taken course 77B. GE credit: ArtHum | AH, VL.—III. (III.) Savageau  
(change in existing course—eff. spring 13)

115. Letterforms and Typography (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16 or consent of instructor. Priority given to Design majors. Fundamentals of letterforms and typography. Characteristics of typefaces, formatting and composition of type. Principles of legibility, visual hierarchy, grid systems, and the integration of type and image. Not available for credit to students who have completed course 152. GE credit: AHC, VLL.—II, III, IV, (II, III, III, IV) Verba  
(change in existing course—eff. spring 13)

116. Visual Communication: Graphic Design Studio (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 21, 115 or consent of instructor. Priority given to Design majors. Multiple, conceptually linked assignments focusing on the fundamental choices designers make in translating concepts into effective graphic form. Problem finding and analysis of operational and visual sequences and the development of three-dimensional forms. Required field trips. GE credit: AHC, VLL.—II, III, IV, (II, III, IV) Verba  
(change in existing course—eff. spring 13)

117. Interactive Media I (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; 115 recommended, or consent of instructor. Priority given to Design majors. Practice of creating interactive visual media for networked environments and principles of human computer interaction. Responsive design. Usercentered research, information architecture, interface and interaction. Analysis of usability. Development and presentation of design production materials and completed interactive projects. GE credit: ArtHum | AH, VL.—II, IV. (II, IV) Drew  
(change in existing course—eff. fall 13)

127A. Sustainable Design (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Priority to Design majors. Principles, practice and materials of contemporary sustainable design in the context of environmental crisis. History of sustainable design in relation to the fields of textiles, visual communication, interior architecture, exhibition design and lighting. GE credit: ArtHum | AH.—II. (II) Savageau  
(change in existing course—eff. fall 13)

127B. Studio Practice in Sustainable Design (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 127A or consent of instructor. Priority to Design majors. Analysis and practice of sustainable design within studio context. Design project that incorporates the reuse of post consumer waste; standard materials vs. sustainable materials; Cradle to Cradle philosophy and practice. Field trips required. GE credit: ArtHum | AH—VLL.—III. (III.) Savageau  
(change in existing course—eff. spring 13)

131. Global Fashion and Product Design (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 77 recommended or consent of instructor. Priority given to Design majors. Exploration of materials, embellishments, and structural techniques derived from historic and contemporary world cultures. Emphasis on unique qualities of individual expression applied to handmade textiles, fashion and textile products. Offered irregularly. GE credit: ArtHum | AH, VL.—Avila  
(change in existing course—eff. spring 13)

132A. Textile Design: Woven Structures (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 60 recommended or consent of instructor. Priority given to Design majors. Focus on handwoven textile structure and design, emphasizing yarn identification, basic drafting, basic weaves and their derivatives explored in context of original color effects and yarns. May be repeated one time for credit with consent of instructor. Offered irregularly. GE credit: ArtHum | AH, VL.—Avila  
(change in existing course—eff. spring 13)

132B. Loom-Constructed Textile Design (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 132A recommended or consent of instructor. Priority to Design majors. Exploration of materials and techniques of light sources, luminaires, and lighting controls to enhance the functional and aesthetic impact of interior and exterior spaces. Industrial design projects exploring lighting effects, light distribution characteristics, and luminaire design. GE credit: ArtHum | AH, VL.—II. (II) Siminovic  
(change in existing course—eff. spring 13)

134A. Introduction to Interior Design—Residential (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1 and 21; courses 14, 15, 16 recommended or consent of instructor. Priority to Design majors. Introduction to the theory and practice of interior design with focus on residential spaces. Basic methods of design conceptualization, development, and presentation. GE credit: ArtHum | AH, VL.—I. (I) Kessler  
(change in existing course—eff. fall 13)

134B. Introduction to Interior Design—Commercial and Technical Spaces (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1 and 21; 14, 15, 16 recommended or consent of instructor. Pass One priority given to Design majors. Introduction to the theory and practice of interior design with focus on small commercial and technical spaces. Archetypal spaces, non-residential building systems, ADA accessibility, design research methods. GE credit: ArtHum | AH, VL.—I. (I) Kessler  
(change in existing course—eff. winter 14)

135A. Furniture Design and Detailing (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 21 recommended or consent of instructor. Priority given to Design majors. Design and construction of full size prototypes. Furniture based on preliminary work completed in course 135A. Material technology, construction methods, and finishes discussed. Development of shop drawings and furniture construction. Required field trip. Offered irregularly. GE credit: ArtHum | AH, VL—II. (II) Kessler  
(change in existing course—eff. spring 13)

135B. Furniture Design and Prototyping (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 21 recommended or consent of instructor. Priority given to Design majors. Design and construction of full size prototypes. Furniture based on preliminary work completed in course 135A. Material technology, construction methods, and finishes discussed. Development of shop drawings and furniture construction. Required field trip. Offered irregularly. GE credit: ArtHum | AH, VL—II. (II) Kessler  
(change in existing course—eff. spring 13)

136A. Lighting Technology and Design (4)  
Laboratory—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 21 recommended or consent of instructor. Priority to Design majors. Design and construction of lighting systems using light sources, luminaries, and lighting controls to enhance the functional and aesthetic impact of interior and exterior spaces. Industrial design projects exploring lighting effects, light distribution characteristics, and luminaire design. GE credit: ArtHum | AH, VL.—II. (II) Siminovic  
(change in existing course—eff. spring 13)

136B. Designing with Light—Industrial Design (4)  
Laboratory—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; 136A; course 21 recommended or consent of instructor. Priority to Design majors. Design and construction of lighting systems using light sources, luminaries, and lighting controls to enhance the functional and aesthetic impact of interior and exterior spaces. Industrial design projects exploring lighting effects, light distribution characteristics, and luminaire design. GE credit: ArtHum | AH, VL.—II. (II) Siminovic  
(change in existing course—eff. spring 13)

137A. Daylighting and Interior Design (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 21 recommended or consent of instructor. Priority to Design majors. Design and construction of lighting systems using light sources, luminaries, and lighting controls to enhance the functional and aesthetic impact of interior and exterior spaces. Industrial design projects exploring lighting effects, light distribution characteristics, and luminaire design. GE credit: ArtHum | AH, VL.—III. (III) Papamichalis  
(change in existing course—eff. spring 13)

137B. Daylighting Design Studio (4)  
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 21 and 137A recommended or consent of instructor. Priority to Design majors. Introduction to daylighting through observation of its effects in interior environments, using scale models of interior designs of choice and photographing them outdoors and in CTLIC’s Heliodon to understand year-round performance. GE credit: ArtHum | AH, VL.—II. (II) Papamichalis  
(change in existing course—eff. spring 13)

138. Materials and Methods in Interior Design (4)  
Lecture—discussion—3 hours; project—1 hour. Prerequisite: course 1, 14, 15, 16 or consent of instructor. Priority to Design majors. Introduction to the finish materials used for interior design with special emphasis on sustainable and recycled products. Performance factors, relative costs and energy impacts, installation conditions and construction details, and design potential for a full range of interior materials. Offered in alternate years. GE credit: ArtHum | AH, VL—WE.  
(change in existing course—eff. fall 13)

143. History of Fashion (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1; ArtHistory 1A, 1B or 1C recommended or consent of instructor. Priority to Design majors.
Social context, aesthetics, stylistic developments and methods significant in the history of interior design. Emphasis on the design and construction of buildings for contemporary needs, including the Middle East, Europe, and the Americas up to contemporary times. Two field trips required. GE credit: ArtHum | AH, VL, WE. —II. (II.) Avila

15A. Pattern, Form and Surface (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 115. Instructor: Avila. Requirement of instructor. Priority given to Design majors. Experimental approaches to form-making through an examination of pattern, form, and surface in historical and contemporary contexts. Additional emphasis on the interrelation of design processes, methods, and materials that open new possibilities for content creation and invention in design practice. GE credit: VL.—II, III, IV, (II, III, IV) Verba.

171. Fashion Drawing: Technical and Illustration (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 77 recommended or consent of instructor. Priority to Design majors. Exploration of fashion design processes for industry and personal expression with emphasis on computer-assisted design applications. Field trip required. GE credit: ArtHum | AH, VL.—I. (II.) Avila

177. Computer-Assisted Fashion Design (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 77 or consent of instructor. Priority to Design majors. Advanced exploration of apparel design processes for industry and personal expression with emphasis on computer-assisted design applications. Field trip required. GE credit: ArtHum | AH, VL.—III. (III.) Avila

179. Fashion Design: Signature Collection (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 77, 107, 170 or 177 recommended or consent of instructor. Priority to Design majors. Advanced exploration of fashion design with an emphasis on professionalism, portfolio development and presentation. Emphasis on conceptualizing, designing, and fabricating a cohesive line of wearable garments suitable for presenting in a public fashion show. Not open for credit to students who have taken more than 8 units of course 170A. May be repeated for credit once with consent of instructor. GE credit: ArtHum | AH, VL—II. (II.) Avila

180A. Advanced Interior Design: Institutional Spaces (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1 and 21; 14, 15, 16 recommended or consent of instructor. Priority to Design majors. Advanced interior design problems related to spaces on complex institutional spaces. Introduction to building codes related to interior design. Integration of building systems with interior design solutions. GE credit: ArtHum | AH, VL.—II. (II.) Kesler

186. Environmental Graphic Design (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; courses 50, 115, 150A recommended or consent of instructor. Priority to Design majors. Design of cultural and commercial exhibition environments, including exhibition development and object selection, spatial planning and architectural finishes, object placement and staging, and interpretative strategies, exhibition and promotional graphics. GE credit: ArtHum | AH, VL—I. (II.) McNeil

188. Advanced Interior Architecture (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 180A or consent of instructor. Priority to Design majors. Advanced problems in interior architectural design emphasizing space planning for corporate and institutional environments. Field trips required. GE credit: ArtHum | AH, VL.—III. (III.) Kesler

185. Exhibition Design (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; courses 50, 115, 150A recommended or consent of instructor. Priority to Design majors. Design of cultural and commercial exhibition environments, including exhibition development and object selection, spatial planning and architectural finishes, object placement and staging, and interpretative strategies, exhibition and promotional graphics. GE credit: ArtHum | AH, VL—I. (II.) Kesler

155. History of Interior Architecture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Pass One priority to Design majors. Thematic survey of interior architecture. Emphasis on dwellings in their cultural settings and development of modern interior design theories. Considered in relation to buildings' interiors, sites, and uses. Offered in alternate years. GE credit: ArtHum | AH, WE. —III. (III.) Housefield

150A. Computer-Assisted Drawing for Designers (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: courses 1 and 21; 14, 15, 16 recommended or consent of instructor. Priority given to Design majors. Computer assisted drawing and modeling using a mid-level, multi-use CAD program. Basic introduction to drawing and modeling techniques in both two-dimensional and three-dimensional CAD environments. Not open for credit to students who have taken course 150. GE credit: ArtHum | AH, VL—I, II, III (II, III)

150B. Computer-Assisted Presentations for Interior Architecture (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1 and course 21; 14, 15, 16 recommended or consent of instructor. Priority given to Design majors. Computer-assisted architectural presentation, including development of complex models, techniques of photorealistic rendering and computer simulation of movement through architectural and interior spaces. Offered irregularly. GE credit: ArtHum | AH, VL.

151. Type in Motion (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: courses 1, 14, 15, 16; course 115 recommended or consent of instructor. Priority given to Design majors. Fundamentals of creating motion-based, screen-based typography. Consideration of narrative structures, movement assemblage, and other visual languages, synthesized within a nuanced understanding of typography within digital space. GE credit: ArtHum | AH, VL—I. (I.) Drew

154. Visual Communication: Message Campaign Design (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 115, course 116 or consent of instructor. Priority given to Design majors. Principles and application of visual design strategies for projects that address a broad public audience. Emphasis on design for social awareness/interaction/benefit. Creation of public visual-media campaign. Not open for credit to students who have completed course 1528. GE credit: ArtHum | AH, VL—I, II, III, IV, (III, IV) Verba

15A. Computer-Assisted Drawing for Designers (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 77 recommended or consent of instructor. Priority given to Design majors. Experimental approaches to form-making through an examination of pattern, form, and surface in historical and contemporary contexts. Additional emphasis on the interrelation of design processes, methods, and materials that open new possibilities for content creation and invention in design practice. GE credit: VL.—II, III, IV, (II, III, IV) Verba.

157. Interactive Media II (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16, 117; course 115 recommended or consent of instructor. Priority to Design majors. Technical and conceptual aspects of creating websites that address other trends, such as CSS for type and interaction with ActionScript. Attention to conceptual framework, visual design and user interaction design. Research and writing assignments. GE credit: ArtHum | AH, VL—II. (II.) Avila

159. Design for Understanding (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16, 115, 116 or consent of instructor. Pass One open to Design majors. Principles of effective information display including aspects of language, structure, legibility, sequencing, and context. Analysis of historical examples of typographic, diagrammatic, and cartographic excellence. May be repeated for credit one time with consent of instructor. GE credit: ArtHum | AH, VL—II. (II.) Avila

160. Textile Surface Design: Patterns and Resist (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 60 or 70 recommended or consent of instructor. Priority to Design majors. Use of traditional and contemporary processes to create images and patterns on fabric using a variety of dyes, including direct applications, bound and mechanical resists. Emphasis on individual exploration and interpretation of processes and techniques. May be repeated for credit one time with consent of instructor. GE credit: ArtHum | AH, VL—II. (II.) Avila

161. Textile Surface Design: Screen and Digital Printing (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 60 or 70 recommended or consent of instructor. Priority to Design majors. Design of textiles and screen printing on fabrics; soft-product development; integration of hand-produced and digitally generated imagery on cloth. GE credit: ArtHum | AH, VL—IV. (IV) Avila

170. Experimental Fashion & Textile Design (4)
Studio—4 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16; course 77, 107 recommended or consent of instructor. Priority to Design majors. Emphasis on designing and interpreting strategies, exhibition and promotional graphics. GE credit: ArtHum | AH, VL—III. (III.) Avila

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer, 2013-2014 offering in parentheses

Pre-Fall 2011 General Education (GE): ArtHum | Arts and Humanities; SciEng | Science and Engineering; SocSci | Social Sciences; DivD = Domestic Diversity; Wrt = Writing Experience

Fall 2011 and on General Education (GE): ArtHum | Arts and Humanities; SciEng | Science and Engineering; SocSci | Social Sciences; ACGH = American Cultures; OL = Oral Skills; OL = Quantitative; SL = Scientific; VL = Visual; WC = World Cultures; Wrt = Writing Experience
111. Advanced Presentation Skills (2) Lecture/laboratory—3 hours. Class size limited to 20 students. Development of clear oral and physical communication skills that build confidence, presentation style and clarity for students whose command of English is at a competent to fluent level. GE credit: OL, VL. (new course—fall 13)

20. Introduction to Dramatic Art (4) Lecture—3 hours; discussion—1 hour. Understanding and appreciation of the visual aspects of dramatic art: theatre architecture, scenery, lighting, costume, and makeup. GE credit: ArtHum | AH, VL. (new course—fall 13)


IV. (I, II, III, IV.) McNeil

Upper Division

116. Design on Screen (4) Lecture/discussion—3 hours; film viewing—3 hours. Analysis of the contribution of outstanding designers for cinema, television and filmed entertainment. Study of diverse aesthetic theories of production design and art direction, costume design, or cinematic typography. Introductory principles and practice, history. May be repeated up to two times for credit. GE credit: ArtHum | AH, VL. (new course—fall 13)

120. Intermediate Acting/Gateway: The Actor’s Toolkit (4) Lecture/laboratory—6 hours. Prerequisite: course 21A or consent of instructor. Limited enrollment. Implementation of acting tools drawn primarily from Stanislavsky’s ‘system’. Gateway into the Advanced Acting courses. GE credit: OL, VL.—I. (new course—fall 13)

121A. Advanced Acting: Scene Study and Script Analysis (4) Lecture/laboratory—6 hours. Prerequisite: course 120 and consent of instructor. Limited enrollment. In-depth study, analysis and performance of texts from different eras, genres and styles. Implementation of tools to undertake independent preparation of character creation. May be repeated up to eight units for credit. Since acting requires repetition to habituate the body and imagination to new practices, this course may be taken twice. New scripts and scenes must be undertaken in the repetition. Offered in alternate years. GE credit: OL, VL.—II. (change in existing course—fall 13)

121B. Advanced Acting: Rehearsal Processes and Practices (4) Lecture/laboratory—6 hours. Prerequisite: course 120 and consent of instructor. Limited enrollment. Development of rehearsal practice and etiquette, using a variety of scenes from different eras and genres. May be repeated up to eight units for credit. The course has been established to enable visiting artists in residence to undertake the instruction, as well as faculty. Therefore, this course may be taken twice, as students will be exposed to different professionals’ working techniques. New scripts and scenes must be undertaken in the repetition. Offered irregularly. GE credit: OL, VL.—II. (change in existing course—fall 13)

121C. Advanced Acting: Character and Style (4) Lecture/laboratory—6 hours. Prerequisite: course 120 and consent of instructor. Limited enrollment. Study of psycho-physical techniques to create characters with an emphasis on non-realistic styles. May be repeated up to eight units for credit. Since acting requires repetition to habituate the body and imagination to new practices, this course may be taken twice. New scripts and scenes must be undertaken in the repetition. Offered in alternate years. GE credit: ArtHum | OL, VL.—II. (change in existing course—fall 13)

122A. Advanced Acting: Devising and Collaboration (4) Lecture/laboratory—6 hours. Prerequisite: course 120 and consent of instructor. Limited enrollment. Study and performance of classical texts (monologues and dialogues), with a focus on Shakespeare and the Elizabethan world view. May be repeated up to eight units for credit. Since acting requires repetition to habituate the body and imagination to new practices, this course may be taken twice. New scripts and scenes must be undertaken in the repetition. Offered in alternate years. GE credit: OL, VL.—II. (change in existing course—fall 13)

122B. Advanced Acting: Shakespeare and His Contemporaries (4) Lecture/laboratory—6 hours. Prerequisite: course 120 and consent of instructor. Limited enrollment. Study and performance of classical texts (monologues and dialogues), with a focus on Shakespeare and the Elizabethan world view. May be repeated up to eight units for credit. Since acting requires repetition to habituate the body and imagination to new practices, this course may be taken twice. New scripts and scenes must be undertaken in the repetition. Offered in alternate years. GE credit: OL, VL.—II. (change in existing course—fall 13)

122C. Advanced Acting: Special Topics in Acting (4) Lecture/laboratory—6 hours. Prerequisite: course 120 and/or consent of instructor. Dramatic Arts majors. Restricted to Dramatic Arts majors. Limited enrollment. Intensive study of the technical exploration of a specialized area (for example, World Theatre, Social Theatre, Physical Theatre, Musical Theatre, the Ancient Greeks, etc.). May be repeated up to eight units for credit. This course is taught by visiting drama faculty and/or guest practitioners. GE credit: OL, VL.—II. (change in existing course—fall 13)
artists and/or faculty seeking to implement specialized areas of practical research into the curriculum. Students may therefore repeat this course in order to work with a range of practitioners. Offered irregularly.—(III.)

(new course—eff. spring 13)

124A. Principles of Theatrical Design: Scenery (4)
Lecture/discussion—4 hours. Prerequisite: course 24 or consent of instructor. Scenery design processes; working drawings, sketching techniques, scale models, methods and materials of scenery construction. GE credit: ArtHum | AH, VL.—I. (I) lacocelli (change in existing course—fall 13)

124B. Principles of Theatrical Design: Scenery (4)
Lecture/discussion—4 hours. Prerequisite: course 24 or consent of instructor. Analysis of plays in terms of scene design, elements of design, execution of designs for modern and period plays. GE credit: ArtHum | AH, VL.—I, II, III, IV. (I, II, III, IV) Munn (change in existing course—fall 13)

124C. Principles of Theatrical Design: Lighting (4)
Lecture/discussion—4 hours. Prerequisite: course 24 or consent of instructor. Theories of lighting the stage, equipment and control systems, execution of lighting plots. GE credit: ArtHum | AH, VL.—II. (III.) Munn (change in existing course—fall 13)

124D. Principles of Theatrical Design: Costume (4)
Lecture/discussion—4 hours. Prerequisite: course 24 or consent of instructor. Source materials for theatrical costume, selecting fabrics, elements of design, analysis of plays in terms of costume design, execution of designs for modern and period plays. GE credit: ArtHum | AH, OL, VL.—I. (I) Morgan (change in existing course—fall 13)

124E. Costume Design for Film (4)
Lecture/discussion—4 hours. Prerequisite: for Dramatic Art majors; course 24 or 124D or consent of instructor. Working in the area of costume design in the film industry. GE credit: ArtHum | AH, VL.—II. (II) Morgan (change in existing course—winter 14)

125. Scenic Painting: Studio (4)
Lecture—2 hours; studio—1 hour; laboratory—3 hours. Prerequisite: upper division standing in Dramatic Art, Art Studio or Design; or course 24 or 25, or consent of instructor. Scene painting techniques, practices and materials including color mixing and matching, wood graining, faux painting techniques, glazing, creating foliage, stone and brick. May be repeated one time with consent of instructor. Offered irregularly. GE credit: ArtHum | AH, VL.—lacocelli, Munn (change in existing course—winter 14)

130. Approaches to Theatrical Design: Practice and Theory (4)
Seminar—2 hours; studio—4 hours. Prerequisite: upper division standing in Dramatic Art, Art Studio or Design; any class from course 124 series or consent of instructor. Advanced design study in specific areas including but not limited to: research, design styles and concepts, new materials and techniques, scenery, lighting, costume, makeup, photography, projections, computer technology, spectacle and special effects, and alternative theatre forms and genres. May be repeated three times for credit when topic differs; when instructor differs. Offered irregularly. GE credit: ArtHum | AH, VL.—(change in existing course—fall 12)

140A. Dance Composition (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 40A, 41A, and 42A, or consent of instructor. Introduction to the craft of choreography. Compose phrases and present movement studies based on the elements of movement, space, time, force/energy. GE credit: VL.—II. (II) Davidson (change in existing course—eff. spring 13)

144C. Daoist Philosophy in Traditional Chinese Movement Culture (4)
Lecture/discussion—4 hours. Prerequisite: course 144B. Daoist practices of movement and their relation to Chinese philosophy, explored through work in dance laboratory conditions. Integration of practice with conceptual analysis, and critical philosophy around values and ethical action. May be repeated twice with consent or instructor varies and if student progression is required. GE credit: ArtHum | AH, WC.—I, II, III, IV. (II, III, IV) Hunter (change in existing course—eff. winter 13)

154. Asian Theatre and Drama: Contexts and Forms (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Selected Asian plays and performance forms in their cultural and artistic contexts; myth, ritual and the theatre, performance training, visual presentation of the text; political theatre; intercultural performance/the fusion of Asian and Western traditions. Offered in alternate years. GE credit: ArtHum, Div. Writ | AH, WC, WE.—II. (II) (change in existing course—fall 13)

155A. African American Dance and Culture in the United States, Brazil and the Caribbean (4)
Lecture/discussion—4 hours. Comparative study of the African American dance forms in the U.S., Brazil, Haiti, Cuba, Jamaica, Barbados, and Trinidad. Examination of ritual, folk, and popular dance forms and the social/historical factors that have influenced these forms. [Same course as African American and African Studies 155A.] Offered in alternate years. GE credit: ArtHum | AH, VL, WC.—II. (II) (change in existing course—eff. winter 13)

170. Media Theatre (4)
Lecture—1 hour; rehearsal—2 hours; performance instruction—1 hour. Prerequisite: upper division standing in Dramatic Art, Music, Art Studio, Design, Technocultural Studies, Film Studies, Computer Science, or Engineering: Computer Science, or consent of instructor. New media and application of theatrical and dance performance through lecture, demonstration, improvisation and experimentation. May be repeated one time with consent of instructor. Offered irregularly. GE credit: ArtHum | AH, VL.—III. (III) (change in existing course—fall 13)

174. Acting for Camera (4)
Lecture/laboratory—6 hours. Prerequisite: consent of instructor. Analysis and practice of acting skills required for camera work and digital media. May be repeated eight times for credit when different instructor is assigned. [Same course as Cinema & Technocultural Studies 174.]—II, III. (II, III) Anderson, Merlin (new course—eff. spring 13)

180A. Theatre Laboratory: Performance (1-5)
Rehearsal—12 hours. Prerequisite: consent of instructor. Limited enrollment. Rehearsal and performance of a production directed or choreographed by visiting Granada Artists-in-Residence and/or faculty, and/or the UC Edge Festival. May be repeated for credit. Since each production involves different scripts, directions, challenges of rehearsal practices and performance processes, it is possible for students to appear in a variety of productions in the course of their education. Admission by audition.—I, II, III, IV, V (I, II, III, IV)

(new course—eff. spring 13)

180B. Theatre Laboratory: Design (1-4)
Prerequisite: course 24, 25, 124A, 124B, 124C, 124D and/or 130 or consent of instructor. Limited enrollment. Design-related participation in theatre and dance productions involves research, creation and implementation of design concept in collaboration with the director and other members of the production team. May be repeated for credit. Because each theatrical piece is conceived and produced afresh with new source material, scripts, and production style the challenges and assignments for the designers will be new each and every time they design a show. GE credit: ArtHum | AH, VL.—I, II, III, IV. (II, III, IV) (new course—eff. spring 13)

180D. Theatre Laboratory: Costume (1-4)
Laboratory—3-12 hours. Prerequisite: consent of instructor. Practical experience working on scenery and properties for theatre and dance department productions. Study and execution of basic costume construction techniques and materials, tools, and equipment use. Skills development, professional etiquette. Safety training requirement. May be repeated for credit.—I, II, III, IV. (I, II, III, IV) (new course—fall 13)

180G. Theatre Laboratory: Lighting/ Sound/Projection (1-4)
Laboratory—3-12 hours. Prerequisite: consent of instructor. Practical experience working on costumes for theatre and dance department productions. Study and execution of basic costume construction techniques and materials, tools, and equipment use. Skills development, professional etiquette. Safety training requirement. May be repeated for credit.—I, II, III, IV. (I, II, III, IV) (new course—eff. spring 13)

180H. Theatre Laboratory: Lighting/ Sound/Projection (1-4)
Laboratory—3-12 hours. Prerequisite: consent of instructor. Practical experience working on lighting, sound or projections for theatre and dance department productions. Study and execution of basic costume construction techniques and materials, tools, and equipment use. Skills development, professional etiquette. Safety training requirement. May be repeated for credit.—I, II, III, IV. (I, II, III, IV) (new course—eff. spring 13)

Graduate

257. Interdisciplinary Seminar in Theatre, Dance and Performance (1-5)
Seminar—1-5 hours; project—1.5 hours. Prerequisite: consent of instructor. Students must be enrolled on the MFA in Dramatic Art. Students taking the PhD in Performance Studies or the DE in Studies in Performance and Practice may apply to join this interdisciplinary seminar for first and second year MFA students in Dramatic Art. Topics range from current practice in dance, theatre, film and perfor-
mance, to leading edge developments by outstanding practitioners in the field. May be repeated two times for credit.—II. (III.)

Ecology

New and changed courses in Ecology (ECL)

Graduate

201. Ecosystems and Landscape Ecology (4) Lecture—3 hours; discussion—1 hour. Prerequisite: courses 200A and 200B. Integration of concepts to understand and manage ecosystems in a complex and changing world. Emphasis on interactions among biotic, abiotic and human factors and changes over space/time. Local to global controls over water, carbon and nutrients across ecosystems/landscapes. GE credit: SciEng | SE.—II. (II.) Cade

new course—eff. spring 13

233. Computational Methods in Population Biology (3) Lecture—3 hours; term paper. Prerequisite: graduate standing in Anthropology, Ecology, Political Science, Sociology Graduate Groups, or consent of instructor. Principles drawn from social science, ecology and evolution to study human populations and behavior, emphasizing environmental/resource issues. These principles form a synthetic framework that articulates elements drawn from the social sciences as well as biology. Offered in alternate years.—II. Lubell, McElreath

(new course—eff. spring 13)

271. Research Conference in Ecology (1) Seminar—1 hour. Prerequisite: consent of instructor. Critical presentation and evaluation of current literature and ongoing research in ecology. Requirements include active participation in weekly discussions and the presentation of a paper or chapter once per quarter. May be repeated for credit. (Same course as Population Biology 237.) GE credit: SC, VMA grading only)—II. (II.) Basket, Schreiber

(new course—eff. fall 13)

Economics

New and changed courses in Economics (ECN)

Upper Division

115A. Economic Development (4) Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A and 1B. Major issues encountered in emerging from international poverty, including problems of growth and structural change, human wel-

fare, population growth and health, labor markets and internal migration. Important issues of policy concerning international borrowing and industrialization. (Same course as Agricultural and Resource Economists 115A.) GE credit: SocSci, Div | SS, WC.—II. (II.) Taylor

(new course—eff. fall 11)

115B. Economic Development (4) Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A and 1B. Major issues encountered in developing countries. Issues include problems in generating capital, conduct of monetary and fiscal policies, foreign aid and investment. Important issues of policy concerning international borrowing and external debt of developing countries. (Same course as Agricultural and Resource Economists 115B.) GE credit: SocSci | SS, WC.—II. (II.) Taylor

(change in existing course—eff. fall 11)

125. Efficiency in Energy Markets (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A and 1B, Mathematics 16A and 16B and course 102 or consent of instructor; intended for advanced economics undergraduates. Pass One open to Economics and Graduate School of Management major. Emphasis on theoretical and empirical models to examine efficiency in production and use. Energy and environmental policy, market structure and power, global climate change, optimal regulation, and real-world applications; e.g., California electricity crisis.—II. (II.) Rap

son

(change in existing course—eff. winter 14)

192W. Internship in the Davis-in-Washington Program (6-8) (cancelled course—eff. winter 14)

Education

New and changed courses in Education (EDU)

Lower Division

81. Learning in Science and Mathematics (4) Lecture/discussion—2 hours; field work—2 hours. Exploration of how students learn and develop understanding and skills in science and mathematics classrooms. Introduction to case studies and interview techniques and their use in K-6 classrooms to illumina-

fate factors that affect student learning. Limited enrollment. GE credit: SciEng 81 | P/NP grading only.) GE credit: SS, VL, WC.—II. (II.) Basket, Schreiber

(change in existing course—eff. winter 13)

Upper Division

100. Introduction to Schools (4) Lecture—3 hours; field work—3 hours. Prerequisite: upper division standing. Study of occupational concerns of teachers; skills for observing classroom activities; school organization and finance; school reform movement; observing, aiding, and tutoring in schools. GE credit: ACGH, DD, OL, SS.—II. (II.) III. (II, III.) Schoener, Schreiber

(change in existing course—eff. winter 14)

115. Educating Children with Disabilities (2) Lecture—2 hours. Prerequisite: upper division standing. Educational issues and processes involved in teaching children with disabilities. The course will focus on the structure of special education, with an emphasis on meeting the educational needs of chil-

dren who are mainstreamed in regular classes. GE credit: SocSci | SS,—II. (II.) III. (I, III.) Martin

(change in existing course—eff. winter 13)

199. The Use and Misuse of Standardized Tests (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 110 or consent of instructor. Principles underlying educational and psychological testing. Pur-

poses of testing for individual achievement and evaluation of school programs. Interpretation and misinterpretations of outcomes. Analysis of SAT, GRE and other common tests. Experience in test adminis-

tration and outcome interpretation. GE credit: SocSci | WHT | QL, SS, WE.—II. (II.) Abed

(change in existing course—eff. winter 13)

130. Issues in Higher Education (4) Discussion—3 hours; field work—3 hours. Prerequisites: upper division standing or consent of instructor. Analysis of current issues in higher education and of some practical implications of varying philosophical approaches to the role of the university. GE credit: SocSci | SS, WE.—II. (III.) Gonzalez

(change in existing course—eff. winter 13)

142. Introduction to Environmental Education (4) Lecture—3 hours; field work. Study of history, philos-

ophy, principles and approaches to environmental education (EE) and environmental education majors. Teaching strategies and techniques in EE and out-

reach; evaluation of EE curricula in non-formal and in-school contexts; observing, aiding and facilitating local environmental education programs. GE credit: SocSci | OL, SS.—I. (I.) Ballard

(change in existing course—eff. winter 13)

152. Academic Spanish for Bilingual Teachers (3) Lecture/discussion—4 hours; extensive writing. Intro-
duction to cultural diversity and education in a socio-

political context. Interactive course. Small and large group discussions explore, extend, and apply read-

ings; range of writing genres for responses to assign-

ments and course themes; lectures, slide shows, speakers, brief fieldwork, and presentations. GE credit: SocSci | SS, DD, WE.—II. (II.) III. (II, III.) III. (III.) Athanas

(change in existing course—eff. winter 13)

173. Language Development (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Linguistics 1 or consent of instructor; Linguistics 103A, 103B. Theory and research on children's acquisition of their native language, including the sound system, grammatical systems, and basic semantic categories. (Same course as Linguistics 173.) GE credit: SocSci | SS,—II. (II.) III. (III.) Tontokovich

(change in existing course—eff. winter 13)

180. Computers in Education (3) Lecture/discussion—1 hour; laboratory—2 hours; project—3 hours. Prerequisite: acceptance in Teacher Credential Program. Restricted to Teaching Credential Majors. Applications of computers in edu-

cation as instructional, intellectual, and communica-

tion tools. (Deferred grading only, pending completion of sequence.)—II. (II.) III. (I, III.)

(change in existing course—eff. fall 13)

180T. Computers in Education (3) (cancelled course—eff. fall 14)
181. Teaching in Science and Mathematics (2)
Lecture/discussion—2 hours; field work—2 hours. Prerequisite: major in mathematics, science, or engineering; or completion of a one-year sequence of science or calculus and consent of the instructor. Class size limited to 40 students per section. Exploration of effective teaching practices based on examination of how middle school students learn math and science. Selected readings, discussion and field experience in middle school classrooms. (Same course as Geology 181.) GE credit: SS, WE.—I, II, III, IV. (I, II, III) Passmore, Harris, Walter (change in existing course—eff. winter 13)

183. Teaching High School Mathematics and Science (3)
Lecture/discussion—2 hours; field work. Prerequisite: course 81/Geology 81 or course 181/Geology 181 and major in mathematics science or engineering; or completion of a one-year sequence of science or calculus and consent of the instructor. Limited to 40 students per section. Exploration and creation of effective teaching practices based on examination of how high school students learn mathematics and science. Field experience in high school classrooms. (Same course as Geology 183.) GE credit: SacSci | OL, SS, WE.—I, II, III, IV. (I, II, III) Passmore, Stevenson (change in existing course—eff. spring 13)

185. Learning in a Digital Age: Information, Schooling, and Society (4)
Lecture/discussion—2 hours; lecture/laboratory—2 hours. This course involves the nature of learning in a digital age: social media, ubiquitous connectivity, online education, electronic communication, writing, gaming, and youth culture. Readings will be drawn from literature exploring technological shifts in information, schooling, and society. Offered in alternate years. GE credit: SacSci | OL, VL, SS.—II. Ching (new course—eff. fall 13)

Graduate

238. Participatory Action Research (PAR) (4)
Lecture/discussion—2 hours; fieldwork—1 hour. Prerequisite: minimum of one quarter recommended of an introductory research methods course. Principles and strategies of PAR and related methodologies that emphasize collaboration with those affected by the issue being researched in order to educate, take action or effect social change. Conduct interviews with potential collaborators, case analyses and research proposals.—II. (II) Ballard (new course—eff. winter 13)

275A. Effective Teaching (4)
(canceled course—eff. winter 14)

275A. Effective Instruction: Curriculum and Assessment Theory, Research, and Practice (2)
Lecture/discussion—2 hours. Prerequisite: acceptance in Teacher Credential Program. Restricted to Teaching Credential majors. Examination of contemporary theories of curriculum development, research about the relationship among instructional planning, classroom assessment, and student learning to guide teaching practice. —I, II, III, IV (new course—eff. fall 13)

275B. Effective Instruction: English Language Development and Instructing English Language Learners (2)
Lecture/discussion—2 hours. Prerequisite: acceptance in the Teaching Credential program; successful completion of course 275A. Restricted to Teaching Credential majors. Analysis and application of English language acquisition and development research to teaching practice. Particular attention to research that enhances learning of English language learners and under-performing students.—I, II, III, IV (new course—eff. fall 13)

Professional

324B. Methods in Secondary Mathematics II (3)
Lecture/discussion—3 hours. Prerequisite: admission into a teacher education program or consent of instructor. Expansion of methods and curriculum for teaching mathematics at the secondary level. Intermediate applications of computer technology as instructional, intellectual, and communication tools in mathematics teaching. —III. (III) Wallace (change in existing course—eff. winter 14)

Engineering

New and changed courses in Engineering (ENG)

Lower Division

1. Introduction to Engineering (1)
Lecture—1 hour. Open to first year students only. Introduction to the role of engineers in the acquisition and development of engineering knowledge, the differences and similarities among engineering fields, and the work ethic and skills required for engineering. (P/NP grading only.) GE credit: SE.—I, II, III, IV (I, II, III) VanderGheynst (change in existing course—eff. winter 13)

4. Engineering Graphics in Design (3)
Lecture—2 hours; laboratory—3 hours. Engineering design, descriptive geometry, pictorial sketching, computer-aided graphics, and their application in the solution of engineering problems. GE credit: SciEng | SE, VL.—I, II, III (I, II, III) Schaad (change in existing course—eff. winter 13)

6. Engineering Problem Solving (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 16A, 17A or 21A, C- or above; Mathematics 16B, 17B or 21B, C- or above may be taken concurrently. Methodology for solving engineering problems. GE credit: SciEng | SE.—I, II, III, IV (I, II, III) Schaad (change in existing course—eff. winter 13)

10. The Science Behind the Technology in Our Lives (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: high school algebra. Understanding of how the technology in our lives works using only basic concepts and rudimentary mathematics. GE credit: SciEng or SacSci, Wit, VL or SE or SS.—I, II, Baldis, Orel, Parikh (change in existing course—eff. spring 13)

20. Introduction to Space Exploration: Understanding the Technological and Environmental Challenges to Our Exploration of the Solar System (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: high school level Algebra, Geometry, General Science (Physics and Chemistry). Introductory overview of the space environment. Discussion of space exploration technology including propulsion, orbital mechanics, and spacecraft engineering. Offered in alternate years. GE credit: SciEng | VL, SE, VL.—III, IV (I, II, III) Harris, Walker (change in existing course—eff. winter 14)

35. Statics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Physics 9A; Mathematics 21D (may be concurrent). Force systems and equilibrium conditions with emphasis on engineering problems. GE credit: SciEng | SE.—I, II, III, IV (I, II, III) (change in existing course—eff. fall 13)

45. Properties of Materials (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in Mathematics 16C or 21C, Chemistry 2A, and Physics 9A. Introductory course on the properties of engineering materials and their relation to the internal structure of materials. GE credit: SciEng, Wit | OL, SS, VL, WE.—I, II, III, IV (I, II, III, IV) (change in existing course—eff. winter 13)

45Y. Properties of Materials (4)
Web virtual lecture, laboratory. Prerequisite: C- or better in Mathematics 16C or 21C, Chemistry 2A and Physics 9A. Introductory course on the properties of engineering materials and their relation to the internal structure of materials. Not open for credit to students who have taken course 45. GE credit: SciEng | VL, SE, VL.—IV. (IV) (new course—eff. summer 13)

Upper Division

102. Dynamics (4)
Lecture—4 hours. Prerequisite: grade of C- or better in Engineering 35 and Mathematics 228. Open to College of Engineering students only. Kinematics and dynamics of particles, systems of particles, and rigid bodies; application of these topics are applied to engineering problems. Only two units of credit allowed to students who have previously taken course 36. GE credit: SciEng | OL, SE, VL.—I, II, III, IV, (I, II, III) Hess, Schaad, Velinsky (change in existing course—eff. winter 13)

103. Fluid Mechanics (4)
Lecture—4 hours. Prerequisite: C- or better in each of the following: Engineering 35 and Mathematics 228 and Physics 9B. Open to students in the College of Engineering and Hydrology majors. Fluid properties, fluid statics, continuity and linear momentum equations for control volumes, flow of incompressible fluids in pipes, dimensional analysis and boundary-layer flows. Not open for credit to students who have completed Chemical Engineering 150A. GE credit: SciEng | SE.—I, II, III, IV (I, II, III) (change in existing course—eff. fall 13)

104. Mechanics of Materials (4)

104L. Mechanics of Materials Laboratory (1)
Laboratory—3 hours. Prerequisite: course 104. Experiments which illustrate the basic principles and verify the analysis procedures used in the mechanics of materials are performed using the basic tools and techniques of experimental stress analysis. GE credit: SciEng | SE.—I, II, III, IV (I, II, III) (change in existing course—eff. winter 13)

105. Thermodynamics (4)
Lecture—4 hours. Prerequisite: grade of C- or better in Mathematics 22B and Physics 9B. Open to College of Engineering students only. Fundamentals of thermodynamics: heat energy and work, properties of pure substances, First and Second Law for closed and open systems, reversibility, entropy, thermody-
190. Professional Responsibilities of Engineers (3)
Lecture—3 hours. Restricted to upper-division stu-
dents in the College of Engineering. Organization of
the professional engineering profession; introduction to
contracts, specifications, business law, patents, and liabil-
ity; discussion of professional, ethical, societal, and
political issues related to engineering. GE credit:
I. (II.) Haflez
(change in existing course—eff. winter 13)

111. Electric Power Equipment (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite:
grade of C- or better in course 17. Principles of AC
and DC electric motors and generators, their control
systems and power sources. Selection of electric
power equipment components based on their con-
struction features and performance characteristics.
Offered irregularly. GE credit: SciEng | QL, SE, VL,
WE.—Delwiche Hartsough
(change in existing course—eff. winter 13)

121. Fluid Power Actuators and Systems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite:
grade of C- or better in Engineering 100 and Engi-
neering 102. Hydraulic and pneumatic systems with
emphasis on analysis and control of actuators.
Design of hydraulic and pneumatic systems, specifi-
cations to size components, and selection of
hydro- and pneumatics, servo valves, and
and closed loop systems to solve basic control prob-
lems. Offered in alternate years. GE credit: SciEng | QL,
SE, SL, SS, VL.—II, III, IV. I. (II.) van Dam
(change in existing course—eff. winter 13)

122. Introduction to Mechanical Vibrations (4)
Lecture—4 hours. Prerequisite: C- or better in Engi-
neering 102; C or better in Engineering 6 or course
5 or Computer Science Engineering 30; ability to
program in MATLAB. Free and forced vibrations in
lumped-parameter systems with and without damp-
ing; vibrations in coupled systems; electromechani-
cal analogs; use of energy conservation principles.
GE credit: SciEng | QL, SE.—I. (I.) Hubbard
(change in existing course—eff. fall 13)

160. Environmental Physics and Society (3)
Lecture—3 hours. Prerequisite: Physics 9D, 3C, or
10 or 18 and Mathematics 168 or the equivalent.
Impact of humankind on the environment will be dis-
cussed from the point of view of the physical sci-
cences. Calculations based on physical principles will
be made, and the resulting policy implications will be
considered. (In the College of Engineering, stu-
dents may receive only one unit of credit towards the
teaching Electives requirement.) (Same course as
Physics 160.) GE credit: SciEng or SocSci | SE or
SL.—I. (I.) Jungerman, Craig
(change in existing course—eff. fall 11)

180. Engineering Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
C- or better in Mathematics 21D and 228; C- or bet-
ter in Engineering 6 or Mechanical Engineering 5 or
Computer Science Engineering 30. Solutions of sys-
tems of linear and nonlinear algebraic equations;
approximation methods; solutions of ordinary differ-
etial equations; initial and boundary value prob-
lems; solutions of partial differential equations of
Elliptic, parabolic, and hyperbolic types; Eigen
value problems. GE credit. GE credit: SciEng | SE.—I, II.
Haflez
(change in existing course—eff. fall 13)

216. Theoretical and Computational Aerodynamics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
C- or better in course 127; C- or better in Engi-
neering 180 or Applied Science Engineering 115 or
Mechanical Engineering 115 or Mathematics 128C.
Development of general equations of fluid motion.
Study of flow field kinematics and dynamics. III. Rosa
About a body. Thin airfoil theory. Viscous effects.
Applications of numerical methods to wing analysis
and design. GE credit: SciEng | SE.—III, IV. (III.) Haflez
(change in existing course—eff. fall 13)

350. Aerospace Structures (4)
Lecture—4 hours. Prerequisite: C- or better in Engi-
neering 104; course 126 or 127 recommended.
Analysis and design methods used in aerospace
structures. Shear flow in open, closed and multiellip-
beams cross-sections, buckling of flat and curved
sheets, tension field beams, local buckling. GE credit:
SciEng | QL, SE.—II, III. La Saponara
(change in existing course—eff. fall 13)

388. Aircraft Propulsion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
C- or better in Engineering 104 or 105. Test
preparation in turbomachinery. Study of the design and
operation of compressors, centrifugal and axial
compressors, gas turbines, and steam engines.
GE credit: SciEng | QL, SE.—II. (II.) R. Davis
(change in existing course—eff. fall 13)

400. Rocket Propulsion (4)
Lecture—4 hours. Prerequisite: grade of C- or better
in Engineering 103 or 105. Restricted to upper-
division standing. Fluid and thermodynamics of
rocket engines, liquid and solid rocket propulsion.
Space propulsion concepts and space mission
requirements. Not open for credit to students who
have taken identical course 189A prior to Fall Qua-
ter 2013. GE credit. SciEng | SE.—III, IV. (III, IV)
Haflez
(new course—eff. fall 13)

141. Space Systems Design (4)
Lecture—2 hours; discussion—2 hours. Prerequisite:
grade of C- or better in Engineering 102 and
Mechanical Engineering 106. Introduction to space
systems design including space project organiza-
tion, requirements definition and specification, con-
cepts formulation, system tradeoffs, subsystem
design. Prototype space mission concepts are pre-
sented and a multidisciplinary mission design is
developed that considers all relevant architecture
elements. Offered in alternate years. GE credit:
SciEng | SE.—I. (I.) Joshi
(change in existing course—eff. fall 13)

19A. Rocket Propulsion (4)
(canceled course—eff. summer 13)

19B. Orbital Mechanics (4)
(canceled course—eff. summer 13)

19C. Flight Simulation and Testing in
Design of Aircraft and Spacecraft (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite:
Engineering 102; consent of the instructor. Teaches
flight test techniques together with data analysis
methods to prepare students for all types of flight
testing including fixed wing, rotary wing and launch
vehicles. Offered irregularly. GE credit: SciEng | SE—IV, (IV.) SarigokKlijn
(new course—eff. fall 13)

Engineering: Applied Science—Davis
New and changed courses in Engineering: Applied Science—
Davis (EAD)

2. Introduction to Applied Computational
Science and Engineering (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite:
Mathematics 21C [may be taken concurrently], Phys-
ics 9A [may be taken concurrently], Computer Sci-
ence Engineering 30. Role of mathematics in
modeling physical, biological, and engineering phe-
nomena. Fifths in computation. Limitations of mod-
els, numerical implementations, and quality
assessment of computational data. Interactions
among mathematicians, algorithms, computer hard-
ware and software, and selected scientific and engi-
neering applications. GE credit. SciEng | SE.—II, III.
(change in existing course—eff. winter 13)

Upper Division

108A. Optics I (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite:
Physics 9C and Mathematics 21D. Optical proper-
ties of matter, the nature of light, reflection, refrac-
tion, and other properties of light. Basic optical
components, reflecting systems, and dispersive com-
ponents.
115. Numerical Solution of Engineering and Scientific Problems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2, 116; Physics 104A. Numerical techniques for simulation and modeling of nonlinear deterministic systems. GE credit: SciEng | SE.—I. II, III. (I, II, III.) Baldis, Kolner

116. Computer Solution of Physical Problems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 115. Application of computers to the solution of physical problems. Numerical solution of elliptic, parabolic, and hyperbolic partial differential equations. Emphasis on methodology through adaptive methods, evaluation of relationships between physical systems, the model equations, numerical implementation. GE credit: SciEng | SE.—I. II, III. (I, II, III.) McCurdy, Miller, Orel, Laub, McCurdy, Rodrigue

117A. Simulation and Modeling of Deterministic Dynamical Systems (5)
Lecture—3 hours; laboratory—3 hours; extensive problem solving—3 hours. Prerequisite: course 2, 116; Physics 104A. Numerical techniques for simulation and modeling of nonlinear deterministic systems. Examples from fluid, continuum, molecular mechanics, low dimensional nonlinear systems. Emphasis on methodology through adaptive methods, evaluation of relationships between physical systems, the model equations, numerical implementation. GE credit: SciEng | SE.—I. II. (I, II.) Jensen, Cramer, Miller, Orel, Laub, McCurdy, Rodrigue

117B. Simulation and Modeling of Statistical Systems (5)
Lecture—3 hours; laboratory—3 hours; extensive problem solving. Prerequisite: Statistics 131A or Civil and Environmental Engineering 114 or Mathematics 131 or course 117A. Simulation of stochastic systems, maps, and deterministic chaos. Stability and error control in stochastic modeling. Fluctuations and dissipation; dynamics of complex and disordered systems; Monte Carlo techniques. Brownian, Langevin, and molecular dynamics. Simulation of meaningful statistical sampling in stochastic and disordered systems. GE credit: SciEng | QL, SE.—II. III. (II, III.) Miller, Orel, Laub, McCurdy, Rodrigue

117C. Topics in Simulation and Modeling (5)
Lecture—3 hours; laboratory—3 hours; extensive problem solving. Prerequisite: course 117B. Topics may include algorithms in electromagnetics, materials, biology. Fast multiple and resummation techniques, algorithms for integral transforms, mesh generation, combinatorics, encryption, data mining, handling, and compression of large data sets; optimization. GE credit: SciEng | QL, SE.—III. (III.) Miller, Orel, Laub, McCurdy, Rodrigue

118. High-Performance Computing (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 117B (may be taken concurrently). Algorithms for efficient scientific computing on modern high-performance computers; influence on algorithms of hardware computing, memory management, networking, and information flow; managing relationships among computer architecture, software, and algorithms. GE credit: SciEng | SE.—II. (II.) Miller, Orel, Laub, McCurdy, Rodrigue

165. Statistical and Quantum Optics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Chemistry 110A; Electrical and Computer Engineering 1308. Waves and photons; photon number and fluctuations; field and number correlations; atom-photon interactions; interference, broadening, Einstein coefficients; strong field interactions; photon bunching and anti-bunching; photoelectric counting distributions for chaotic and coherent light; squeezed states. GE credit: SciEng | QL, SE.—I. (I.) Miller, Orel, Laub, McCurdy, Rodrigue

166. Linear and Nonlinear Optics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 165. Optical gain and amplification, laser threshold conditions, laser pumping requirements and techniques, laser resonator optics, cavity design, specific laser systems, short pulse generation, Q-switching, mode-locking, principles of nonlinear optics, second harmonic generation, optical parametric amplification, electric-optic effect. GE credit: SciEng | QL, SE.—II. (II.) Krol, Yeh

167. Fourier Optics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Physics 104A and Electrical and Computer Engineering 1308. Linear systems analysis of two-dimensional optical systems, 2D Fourier transforms, scalar diffraction theory, Fresnel and Fraunhofer diffraction, coherent and incoherent, laser properties, spatial frequency analysis, analog optical information processing, spatial light modulators, film, holography, character recognition, and image restoration. GE credit: SciEng | QL, SE.—II. (II.) Krol, Orel, Jensen

169. Optical Properties of Materials (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 108B, Engineering 45, and Chemistry 110A. Relation between structure, composition, and optical properties of laser materials, nonlinear optical materials, photoelectrooptics, fiber optics, semiconductors, liquid crystals, and thin films. GE credit: SciEng | QL, SE.—III. (III.) Krol, Parikh

170. Optical Spectroscopy: Concepts and Instrumentation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 110A and course 166. Fundamentals of absorption and emission, spectrometers, interferometers, light sources and detectors, UV, Visible, and IR spectroscopy, fluorescence spectroscopy, Raman and Brillouin scattering, high-resolution laser spectroscopy. GE credit: SciEng | QL, SE.—III. (III.) Orel, Kolner, Yeh, Parikh

172. Optical Methods for Biological Research (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 108B and 110A, and Chemistry 110A. Optical techniques for resolving significant research problems in biology. Examples include the sequence, structure, and movement of DNA; nuclear organization and DNA replication, channel transport; membrane receptor sites and cell fusion; protein-protein interactions and supramolecular organization. GE credit: SciEng | QL, SE.—III. (III.) Yeh

Graduate
265B. Laser Physics II (4)

Engineering: Biological Systems

New and changed courses in Engineering: Biological Systems (EBS)

Lower Division
1. Foundations of Biological Systems Engineering (4)
Lecture—2 hours; laboratory—3 hours; project—3 hours. Restricted to students in Biological Systems Engineering. Introduction to engineering and the engineering design process with examples drawn from the field of biological systems engineering. Introduction to computer-aided design and mechanical fabrication of devices. Students work on a quarter-long design project. GE credit: SciEng | QL, SE, SL, VL.—I. (I.) Jenkins, Piedrahita

90C. Research Group Conference in Biological Systems Engineering (1)
Discussion—1 hour. Prerequisite: lower division standing in Biological Systems Engineering or Food Engineering; consent of instructor. Research group conference. May be repeated for credit. (P/NP grading only.) GE credit: SE.—I, II, III, (I, II, III.)

92. Internship in Biological Systems Engineering (1-5)
Internship. Prerequisite: lower division standing, project approval prior to period of internship. Supervised work experience in biological systems engineering. May be repeated for credit. (P/NP grading only.) GE credit: SE.

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. Group study of selected topics; restricted to lower division students. (P/NP grading only.) GE credit: SE.

99. Special Study for Lower Division Students (1-5)
(P/NP grading only.) GE credit: SE.
110. Forest Engineering (3)
Lecture—3 hours. Prerequisite: Engineering 104, Biological Sciences 10C. Applications of engineering principles to problems in forestry including those in forest regeneration, harvesting, residue utilization, and transportation. GE credit: SciEng | QL, SE, SL, VL.—I. (II.) Wallender
(change in existing course—eff. winter 13)

114. Principles of Field Machinery Design (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Engineering 102, 104. Traction and stability of vehicles with wheels or tracks. Operating principles of field machines and basic mechanisms used in their design. GE credit: SciEng | QL, SE, VL, WE.—III. Rosa
(change in existing course—eff. winter 13)

120. Power Systems Design (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 17, 102, 103, 105. Design and performance of power devices and systems including combustion engines, electric generators and motors, fluid power systems, fuels, and emerging technologies. Selection of units for power matching and optimum performance. GE credit: SciEng | QL, SE, SL, VL.—I. (II.) Hartough
(change in existing course—eff. winter 13)

125. Heat Transfer in Biological Systems (4)
(change in existing course—eff. winter 13)

127. Mass Transfer and Kinetics in Biological Systems (4)
(change in existing course—eff. winter 13)

128. Biomechanics and Ergonomics (4)
(change in existing course—eff. winter 13)

130. Modeling of Dynamic Processes in Biological Systems (4)
Lecture—4 hours; discussion—1 hour. Prerequisite: course 75; Engineering 6 or Computer Science & Engineering 30; grade of C- or better in Mathematical 22B required for enrollment eligibility. Techniques for modeling processes through mass and energy balance, rate equations, and equations of state. Computer problem solution of models. Example models include package design, evaporation, respiration heating including assessment of foods, and plant growth. GE credit: SciEng | QL, SE, SL, VL.—II. (II.) K. McCarthy, Upadhyaya
(change in existing course—eff. winter 13)

135. Bioenvironmental Engineering (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 125, 130. Biological responses to environmental conditions. Principles of engineering design of environmental control systems. Overview of environmental pollution problems and legal restrictions for biological systems, introduction of environmental quality assessment techniques and environmental pollution control technologies. GE credit: SciEng | QL, SE, SL, VL, WE.—I. (II.) Jenkins, Zhang
(change in existing course—eff. winter 13)

144. Groundwater Hydrology (4)
(change in existing course—eff. winter 13)

145. Irrigation and Drainage Systems (4)
Lecture—4 hours. Prerequisite: course 103 or Hydrologic Science 103 or Engineering 103 recommended. Fundamentals of irrigation and scientific principles applied to the design of surface, sprinkle and micro irrigation systems and drainage systems within economic, biological and environmental constraints. Interactions and applications of irrigation and drainage. GE credit: SciEng | QL, SE, SL, VL.—II. (III.) Fogg
(change in existing course—eff. winter 13)

147. Runoff, Erosion and Water Quality Management in the Tahoe Basin (3)
Lecture/lab—30 hours; fieldwork—15 hours; discussion—15 hours. Prerequisite: Physics 78 or 98, Mathematics 16C or 21C, Civil and Environmental Engineering 142 or Hydrologic Science 141 or Environmental and Resource Sciences 100. Five days of instruction in Tahoe City. Practical hydrology and runoff water quality management from Tahoe Basin slopes. Development of hillslope and riparian restoration concepts, modeling and applications from physical science perspectives including precipitation-runoff relationships, sediment transport, and detention ponds. [Same course as Hydrologic Science 147]. GE credit: SciEng | QL, SE, SL, VL.—II. (III.) Giles, Zhang
(change in existing course—eff. fall 13)

157. Rheology of Biological Materials (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 103 or Engineering 103. Fluid and solid rheology, viscoelastic behavior of foods and other biological materials, and application of rheological properties to food and biological systems (i.e., pipeline design, extrusion, mixing, cooling). GE credit: SciEng | QL, SE, VL, WE.—II. (III.) McCarthy
(change in existing course—eff. fall 13)

161. Kinetics and Bioreactor Design (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 127. Provide the basic principles of reactor design for bioprocess applications. This course emphasizes the following topics: 1) kinetics and reactor engineering principles; 2) biological kinetic; and 3) bioreactor design. GE credit: SciEng | QL, SE, VL.—II. (II.) Fan, Zicari
(change in existing course—eff. winter 13)

165. Bioinstrumentation and Control (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 100. Instrumentation and control for biological production systems. Measurement system concepts, instrumentation and transducers for sensing physical and biological parameters, data acquisition and control, GE credit: SciEng | QL, SE, SL, VL, WE.—I. (II.) Delwiche, Slaughter
(change in existing course—eff. winter 13)

170A. Engineering Design and Professional Responsibilities (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 1, Engineering 102. Engineering design including professional responsibilities. Emphasis on project selection, data sources, specifications, human factors, biological materials, safety systems, and professionalism. Detailed design proposal will be developed for courses 170B and 170BL. GE credit: SciEng | QL, SE, SL, VL, WE.—I. (II.) Giles, Zhang
(change in existing course—eff. winter 13)

170B. Engineering Projects: Design (2)
Discussion—2 hours. Prerequisite: course 170A; course 170BL required concurrently. Individual or group projects involving the design of devices, structures, or systems to solve specific engineering problems in biological systems. Project for study is jointly selected by student and instructor. GE credit: SciEng | QL, SE, SL, VL, WE.—II. (III.) Giles, Zhang
(change in existing course—eff. winter 13)

170BL Engineering Projects: Design Laboratory (1)
Laboratory—3 hours. Prerequisite: course 170B required concurrently. Individual or group projects involving the design of devices, structures, or systems to solve specific engineering problems in biological systems. GE credit: SciEng | QL, QL, SE, SL, VL, WE.—II. (III.) Giles, Zhang
(change in existing course—eff. winter 13)

170C. Engineering Projects: Design Evaluation (1)
Discussion—1 hour. Prerequisite: course 170B; required concurrently in course 170CL concurrently. Individual or group projects involving the fabrication, assembly and testing of components, devices, structures, systems to design specific engineering problems in biological systems. Project for study previously selected by student and instructor in course 170B. GE credit: SciEng | QL, QL, SE, SL, VL, WE.—III. (III.) Giles, Zhang
(change in existing course—eff. winter 13)

170CL Engineering Projects: Design Evaluation (2)
Laboratory—3 hours. Prerequisite: required to enroll in course 170C concurrently. Individual or group projects involving the fabrication, assembly and testing of components, devices, structures, or systems designed to solve specific engineering problems in biological systems. GE credit: SciEng | QL, QL, SE, SL, VL, WE.—III. (III.) Giles, Zhang
(change in existing course—eff. winter 13)

175. Rheology of Biological Materials (3)
Lecture—3 hours. Prerequisite: course 103 or Engineering 103. Fluid and solid rheology, viscoelastic behavior of foods and other biological materials, and application of rheological properties to food and biological systems (i.e., pipeline design, extrusion, mixing, cooling). GE credit: SciEng | QL, SE, VL, WE.—II. (III.) McCarthy
(change in existing course—eff. fall 13)

189A-G. Special Topics in Biological Systems Engineering (1-3)
Variable—3-15 hours. Prerequisite: upper division standing in engineering, consent of instructor. Special topics in: (A) Agricultural Engineering; (B) Aquacultural Engineering; (C) Biomedical Engineering; (D) Biotechnical Engineering; (E) Ecological Systems Engineering; (F) Environmental Systems Engineering.
Engineering; (F) Food Engineering; and (G) Forest Engineering. May be repeated for credit when topic differs. GE credit:SciEng | SE—II, III, Ill. (II, III, Ill.) (change in existing course—eff. winter 13)

190C. Research Group Conference in Biological Systems Engineering (1)
Discussion—1 hour. Prerequisite: upper division standing in Biological Systems Engineering or Food Engineering; consent of instructor. Research group conference. May be repeated for credit. (P/NP grading only.) GE credit: SE—II, III, Ill. (II, III, Ill.) (change in existing course—eff. winter 13)

192. Internship in Biological Systems Engineering (1-5)
Internship. Prerequisite: upper division standing; approval of project prior to internship. Supervised work experience in biological systems engineering. May be repeated for credit. (P/NP grading only.) GE credit: SE. (change in existing course—eff. winter 13)

197T. Tutoring in Biological Systems Engineering (1-5)
Tutoring. Prerequisite: upper division standing. Tutoring individual students, leading small voluntary discussion groups, or assisting the instructor in laboratories affiliated with one of the department's regular courses. May be repeated for credit if topic differs. (P/NP grading only.) GE credit: SE. (change in existing course—eff. winter 13)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only) GE credit: SE. (change in existing course—eff. winter 13)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.) GE credit: SE. (change in existing course—eff. winter 13)

Engineering: Biomedical

New and changed courses in Biomedical Engineering (BIM)

Lower Division

20. Fundamentals of Bioengineering (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Chemistry 2B and Mathematics 21D; Physics 9B; Mathematics 22B. Open to Biomedical Engineering majors only. Principles of momentum and mass transfer with applications to biomedical systems; emphasis on basic fluid transport related to blood flow, mass transfer across cell membranes, and the design and analysis of artificial human organs. GE credit: SciEng | QL, SE, SL, VL—II, III. (II, III.) Yamada (change in existing course—eff. fall 2013)

89A. Topics in Biomedical Engineering (1-5)
Prerequisite: consent of instructor. Restricted to lower division students. Topics in Biomedical Engineering. [A] Cellular and Molecular Engineering. May be repeated for credit when topic differs. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

89B. Topics in Biomedical Engineering (1-5)
Prerequisite: consent of instructor. Restricted to lower division students. Topics in Biomedical Engineering. [B] Biomedical Imaging. May be repeated for credit when topic differs. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

89C. Topics in Biomedical Engineering (1-5)
Prerequisite: consent of instructor. Restricted to lower division students. Topics in Biomedical Engineering. (C) Biomedical Engineering. May be repeated for credit when topic differs. GE credit: SciEng | SE. (change in existing course—eff. winter 2013)

99. Special Study for Undergraduates (1-5)
(P/NP grading only.) GE credit: SE. (change in existing course—eff. winter 13)

Upper Division

102. Quantitative Cell Biology (4)
Lecture/discussion—4 hours. Prerequisite: Biological Sciences 2A; Chemistry 8B. Fundamental cell biology for bioengineers. Emphasis on physical concepts underlying cellular processes including protein trafficking, cell motility, cell division and cell adhesion. Current topics including cell biology of cancer and stem cells will be discussed. Only two units of credit for students who have completed Biological Sciences 104 or Molecular and Cellular Biology 143. GE credit: SciEng | QL, SE, VL—II, Ill. (III.) Yamada (change in existing course—eff. fall 2013)

105. Probability and Statistics for Biomedical Engineers (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Mathematics 21D; Engineering 6 (may be concurrent). Concepts of probability, random variables and processes, and statistical analysis with applications to engineering problems in biomedical sciences. Includes discrete and continuous random variables, probability distributions and models, hypothesis testing, statistical inference and Matlab applications. GE credit: SciEng | QL, SE, VL—II, Ill. (II, III.) Saiz (change in existing course—eff. fall 2013)

106. Biotransport Phenomena (4)
Lecture—4 hours. Prerequisite: C- or better in course 20; course 116 or Neurobiology, Physiology, and Behavior 101; Physics 9B; Mathematics 22B. Open to Biomedical Engineering majors only. Principles of momentum and mass transfer with applications to biomedical systems; emphasis on basic fluid transport related to blood flow, mass transfer across cell membranes, and the design and analysis of artificial human organs. GE credit: SciEng | QL, SE, SL, VL—II, III. (II, III.) Leach (change in existing course—eff. fall 2013)

107. Mathematical Methods for Biological Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 6; course 20; Mathematics 22B. Restricted to Biomedical Engineering majors only. Mathematical and computational modeling to solve biomedical problems. Topics include stochastic processes and Monte Carlo simulations, and partial differential equations. Introduction to numerical techniques in Matlab. GE credit: SciEng | QL, SE, SL, VL—II, Ill. (II, III.) Duan (change in existing course—eff. fall 2013)

110A. Biomedical Engineering Senior Design Experience (3)
Lecture/discussion—1 hour; project—6 hours. Prerequisite: course 110L. Restricted to senior Biomedical Engineering majors (or by consent of instructor). Application of bioengineering theory and experimental analysis to a design project culminating in the design of a unique solution to a problem. Design may be geared towards current applications in biotechnology or medical technology. GE credit: SciEng | QL, SE, SL, VL—II, Ill. (II, III.) Louie, Passerini (change in existing course—eff. winter 2014)

110B. Biomedical Engineering Senior Design Experience (3)
Lecture/discussion—1 hour; project—6 hours. Prerequisite: course 110A. Application of bioengineering theory and experimental analysis to a design project culminating in the design of a unique solution to a problem. Design may be geared towards current applications in biotechnology or medical technology. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | QL, SE, SL, VL—II, Ill. (II, III.) Louie, Passerini (change in existing course—eff. spring 2014)

110L. Biomedical Engineering Senior Design Lab (2)
Laboratory—3 hours; laboratory/discussion—2 hours. Prerequisite: courses 105, 108, 109. Restricted to Senior Biomedical Engineering majors. Manufacturing processes, safety, and computer-aided design techniques applied to the fabrication of biomedical devices. Application of bioengineering principles and design theory to a project culminating in completion of a functional prototype that solves a biomedical problem. GE credit: SciEng | QL, SE, SL, VL—III. (III.) Revzin (change in existing course—eff. fall 2013)

111. Biomedical Instrumentation Laboratory (6)
Lecture—4 hours; discussion/laboratory—4 hours. Prerequisite: courses 105, 107 and 108; Engineering 100 or Electrical Engineering 100; course 116 or Neurobiology, Physiology, & Behavior 101. Open to Biomedical Engineering majors only. Basic biomedical signals and sensors. Topics include analog and digital records using electronic, hydrodynamic, and optical sensors, and measurements made cellular, tissue and whole organism level. GE credit: SciEng | QL, SE, SL, VL—II, III. (II, III.) Marcu, Fan (change in existing course—eff. fall 2013)

116. Physiology for Biomedical Engineers (5)
Lecture—2 hours; discussion—3 hours. Prerequisite: C- or better in Biological Sciences 2A; Physics 9C; Mathematics 22B recommended. Basic human physiology for the nervous, musculoskeletal, cardiovascular, respiratory, gastrointestinal, renal, and endocrine systems. Emphasis on small group design projects and presentations in interdisciplinary topics relating biomedical engineering to medical diagnostic and therapeutic applications. GE credit: SciEng | QL, SE, SL, VL, WE—II, Ill. (II, III.) Louie (change in existing course—eff. fall 2013)

117. Analysis of Molecular and Cellular Networks (4)
118. Microelectromechanical Systems (4) Lecture–2 hours; laboratory–3 hours; discussion—1 hour. Prerequisite: Electrical Engineering 2A; Engineering 100 or Electrical and Computer Engineering 100. Restricted to upper division standing in College of Engineering. Introduction to the theory and practice of microelectromechanical systems (MEMS), including fundamentals of micro-nanofabrication, microscale sensing and actuation, self assembly, microfluidics and lab-on-a-chip. Weekly hands-on laboratory sessions are emphasized on implementation and utilization of MEMS technologies. [Same course as Electrical and Computer Engineering 147.] GE credit: SciEng | QL, SE. — II. (II.) Pan

(change in existing course—eff. winter 13)

126. Tissue Mechanics (3) Lecture–2 hours; laboratory/discussion—3 hours. Prerequisite: Exercise Science 103 and/or Engineering 45 and/or consent of instructor. Structural and mechanical properties of biological tissues, including bone, cartilage, ligaments, tendons, nerves, and skeletal muscle. [Same course as Exercise Biology 126.] GE credit: SciEng | QL, SE, SL, WE. — II. (II.) Hawkins

(change in existing course—eff. winter 13)


(change in existing course—eff. fall 13)


(change in existing course—eff. fall 13)

142. Principles and Practices of Biomedical Imaging (4) Lecture–4 hour. Prerequisite: Physics 9D, Mathematics 22B, course 108 (may be taken concurrently). Basic physics, engineering principles, and applications of biomedical imaging techniques including x-ray imaging, computed tomography, magnetic resonance imaging, ultrasound and nuclear imaging. GE credit: SciEng | QL, SE, SL, VL. — III. (III.) Ferrara

(change in existing course—eff. winter 13)

143. Biomolecular Systems Engineering: Synthetic Biology (4) Lecture–3 hours; discussion—1 hour. Prerequisite: Biological Sciences 2A; Mathematics 16C or equivalent. Includes analysis, design, construction and characterization of molecular systems. Process and biological parts standardization, computer aided design, gene synthesis, directed evolution, protein engineering, issues of human practice, biological safety, security, innovation, and ethics are covered. Offered alternate years. GE credit: SciEng | SE. — III. Facciotti

(change in existing course—eff. fall 13)

151. Mechanics of DNA (3) Lecture–3 hours. Prerequisite: Biological Sciences 2A and Mathematics 22B. Structural, mechanical and dynamic properties of DNA. Topics include DNA recombination, their mechanical properties, in vivo topological constraints on DNA, mechanical and thermodynamic equilibria, DNA dynamics, and their roles in normal and pathological biological processes. Offered in alternate years. GE credit: SciEng | QL, QL, SE. — III. Benham

(change in existing course—eff. winter 13)

152. Molecular Control of Biosystems (4) Lecture–3 hours; discussion—1 hour. Prerequisite: Biological Sciences 2A, Physics 98 and Mathematics 22B. Fundamentals of molecular biomedicine covering state-of-the-art methods for quantitative understanding of gene regulation and signal transduction networks at different levels of organization in health and disease. Topics include classic genetic systems, synthetic circuits, networks disrupted in disease and cancer. GE credit: SciEng | QL, SE. — III. (III.) Saiz

(change in existing course—eff. winter 13)

161L. Biomolecular Engineering Laboratory (3) Laboratory–4.5 hours; lecture/discussion—1.5 hours. Prerequisites: course 161A or Biological Sciences 101. Introduction to the basic techniques in biomolecular engineering. Lectures, laboratory, and discussion sessions will cover basic techniques in DNA cloning, bacterial cell culture, gene regulation, protein expression, and data analysis. Offered alternate years. GE credit: SciEng | QL, SE, SL. — II. (II.)Bayashi

(change in existing course—eff. fall 13)

162. Introduction to the Biophysics of Molecules and Cells (4) Lecture–4 hours. Prerequisite: C or better in Mathematics 22B and Physics 9C. Introduction to fundamental physical mechanisms governing structural and functional aspects of biomacromolecules. Emphasis on a quantitative understanding of the nano-to microscale biomechanics of interactions between and within individual molecules, as well as of their assemblies, in particular membranes. GE credit: SciEng | QL, SE. — II. (II.) Heinrich

(change in existing course—eff. fall 13)

163. Bioelectricity, Biomechanics, and Signaling Systems (4) Lecture–2 hours; discussion–1 hour; project–1 hour. Prerequisite: C or better in Mathematics 22B; coursera.org, Physiology, and Behavior 101. Fundamentals of bioelectricity in cells, the calcium signaling system, and mechanical force generation in muscle. Combination of lecture and projects to promote important 4 skills: critical thinking, analysis, fabrication, and design during hands-on projects using neurons and muscle as microsystems. GE credit: SciEng | QL, SE. — III. (III.) Chen-Liu

(change in existing course—eff. fall 13)

167. Biomedical Fluid Mechanics (4) Lecture–3 hours; discussion–1 hour. Prerequisite: course 108 [may be taken concurrently] or Engineering 103. Basic biophysical mechanisms, Navier Stokes equations of motion, circulation, respiration and specialized applications including miscellaneous topics such as boundary layer flow. Not open for credit to students who have completed Mechanical Engineering 167C. Not offered every year. GE credit: SciEng | QL, SE.

(change in existing course—eff. winter 13)

189A-C. Topics in Biomedical Engineering (1-5) Prerequisite: consent of instructor. Topics in Biomedical Engineering. (A) Cellular and Molecular Engineering (B) Biomedical Imaging (C) Biomedical Engineering. May be repeated if topic differs. Not offered every year. GE credit: SciEng | SE or SS. — III. (III.)

(change in existing course—eff. winter 13)

190A. Upper Division Seminar in Biomedical Engineering (1) Seminar—1 hour. Prerequisite: upper division standing. In depth examination of research topics in a small group setting. Question and answer session with faculty members. May be repeated for credit. (P/NP grading only.) GE credit: SE.

(change in existing course—eff. winter 13)

192. Internship in Biomedical Engineering (1-12) Internship—3.6 hours. Prerequisite: consent of instructor. Restricted to upper division majors. Supervised work experience in the Biomedical Engineering field. May be repeated for credit. (P/NP grading only.) GE credit: SE. — I, II, III, IV. (I, II, III, IV)

(change in existing course—eff. winter 13)

199. Special Study for Advanced Undergraduates (1-5) Prerequisite: consent of instructor. Special study for advanced undergraduates. (P/NP grading only.) GE credit: SE.

(change in existing course—eff. winter 13)

Engineering: Chemical Engineering and Materials Science

New and changed courses in Engineering: Chemical Engineering and Materials Science (ECH)

51. Material Balances (4) Lecture–4 hours. Prerequisite: Mathematics 21D with C- or better, and Mathematics 22A or concurrent. Application of the principle of conservation of mass to single and multiphase systems in chemical process calculations. Studies of batch, semi-batch, and continuous processes involving mass transfer, change of phase, stoichiometry and chemical reaction. Not open for credit to students who have completed course 151. GE credit: SciEng | SE. — II. (II.)

(change in existing course—eff. winter 13)

80. Chemical Engineering Profession (1) Lecture/discussion—1 hour. Professional opportunities and professional responsibilities of chemical engineers. Opportunities and needs for post-baccalaureate education. Relationship of chemical engineering to contemporary issues. GE credit: SciEng or SocSci | SE or SS. — III. (III.)

(change in existing course—eff. winter 13)

98. Directed Group Study (1-5) Prerequisite: consent of instructor and lower division standing. (P/NP grading only.) GE credit: SE. — I, II, III, IV. (I, II, III, IV)

(change in existing course—eff. winter 13)

99. Special Study for Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE. — I, II, III, IV. (I, II, III, IV)

(change in existing course—eff. winter 13)
Upper Division

140. Mathematical Methods in Biochemical and Chemical Engineering (4)
(new course—eff. fall 12)

152A. Chemical Engineering Thermodynamics (3)
Lecture—3 hours. Prerequisite: Chemical and Materials Science Engineering 6 or concurrent enrollment. Application of principles of thermodynamics to chemical processes. Not open for credit to students who have completed Engineering 105 or 105A. GE credit: SciEng | SE.—II. (II)
(change in existing course—eff. winter 13)

152B. Chemical Engineering Thermodynamics (4)
Lecture/discussion—4 hour. Prerequisite: course 152A. Continuation of course 152A. Not open for credit to students who have completed Engineering 105. GE credit: SciEng | SE.—III. (III)
(change in existing course—eff. winter 13)

155A. Chemical Engineering Laboratory (4)
Laboratory—6 hours; discussion—1 hour; term paper. Prerequisite: courses 141, 142, and 143 (may be taken concurrently). 155A; satisfaction of the upper division English composition requirement. Open only to majors in Chemical Engineering, Chemical Engineering/Materials Science, Biochemical Engineering, Biomedical Engineering, and Bioengineering Systems Engineering. Laboratory experiments in transport phenomena, chemical kinetics, and thermodynamics. GE credit: SciEng | WRT | QL, SE, VL, WE.—II, III. (II, III)
(change in existing course—eff. winter 13)

155B. Chemical Engineering Laboratory (4)
Laboratory—6 hours; discussion—1 hour; extensive writing—1 hour. Prerequisite: courses 143 (may be taken concurrently), 155A; satisfaction of the upper division English composition requirement. Open only to majors in Chemical Engineering, Chemical Engineering/Materials Science, Biochemical Engineering, Biomedical Engineering, and Biosystems Engineering. Continuation of course 155A. Laboratory experiments in transport phenomena, chemical kinetics, and thermodynamics. GE credit: SciEng, WRT | QL, SE, VL, WE.—II, III. (II, III)
(change in existing course—eff. winter 13)

157. Process Dynamics and Control (4)
Lecture/discussion—4 hours. Prerequisite: course 140. Fundamentals of dynamics and modeling of chemical processes. Design and analysis of feedback control of chemical processes. GE credit: SciEng | QL, SE.—II. (II)
(change in existing course—eff. winter 13)

158A. Process Economics and Green Design (4)
(change in existing course—eff. winter 13)

158B. Separations and Unit Operations (4)
Lecture—4 hours. Prerequisite: course 158A. Senior design experience with multiple realistic constraints. Heat and momentum transfer design principles. Not open for credit to students who have completed course 105 or 105A. GE credit: SciEng | QL, SE.—II. (II)
(change in existing course—eff. winter 13)

158C. Plant Design Project (4)
Laboratory/discussion—2 hours; project—2 hours. Prerequisite: course 158B or 161C. Senior design experience for chemical and biochemical processes. Impact of multiple realistic constraints. Design, costing and profitability analysis of complete plants. Use of computer-aided design techniques. GE credit: SciEng | QL, SE, VL, WE.—III. (III)
(change in existing course—eff. winter 13)

160. Fundamentals of Biomanufacturing (3)
Lecture—3 hours. Prerequisite: Microbiology 102, Biological Sciences 102 or Animal Biology 102. Principles of large scale bioreactor production of metabolites, enzymes, and vaccines including the development of strains/cell lines, fermentor/bioreactor design, monitoring and operation, product recovery and purification, and biomanufacturing economics. Not open for credit to students who have completed course 161C or both 161A and 161B; only two units of credit to students who have completed either course 161A or 161B. GE credit: SciEng | QL, SE.—II. (II)
(change in existing course—eff. winter 13)

161A. Biochemical Engineering Fundamentals (4)
Lecture/discussion—4 hours. Prerequisite: course 143. Product recovery and purification of biochemi-
cells. Cell disruption, centrifugation, filtration, membrane separations, extraction, and chromatographic separation. GE credit: SciEng | QL, SE.—II. (II)
(change in existing course—eff. winter 13)

161C. Biotechnology Facility Design and Regulatory Compliance (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 161A (corequisite) and course 161B (coreq-
se), or Molecular & Cellular Biology 263 (coreq-
se). Design of biotechnology manufacturing facilities. Fermentation and purification equipment, and utility systems. Introduction to current good manufacturing practices, regulatory compliance, and documentation. GE credit: SciEng | QL, SE or SS, VL, WE.—II. (II)
(change in existing course—eff. fall 13)

161L. Bioprocess Engineering Laboratory (4)
Laboratory—9 hours; discussion—1 hour; term paper. Prerequisite: course 161A and 161B, or Viticulture and Enology 186, or Biological Sciences 103 and Molecular and Cellular Biology 120L. Restricted to chemical/biochemical engineering majors during pass 1. Laboratory experiments in the operation and analysis of bioreactors; determination of oxygen mass transfer coefficients in bioreactors and ion exchange chromatography. GE credit: SciEng, WRT | QL, SE, VL, WE.—III. (III)
(change in existing course—eff. winter 13)

166. Catalysis (3)
Lecture—3 hours. Prerequisite: course 148A; con-
sent of instructor. Principles of catalysis based on an integration of principles of physical, organic, and inorganic chemistry and chemical kinetics and chem-
ical reaction engineering. Catalysis in solution; catalysis by enzymes; catalysis in solid supports; catal-
ysis in microsopic cages (zeolites); catalysis on surfaces. GE credit: SciEng | SE.—II. (II)
(Gates)
(change in existing course—eff. fall 13)
190C. Research Group Conferences (1)
Discussion—1 hour. Prerequisite: upper division standing in Materials Engineering; consent of instructor. Research group conferences. May be repeated for credit. (P/NP grading only.) GE credit: SE.—I, II, III, (I, II, III). (new course—eff. winter 13)

192. Internship in Chemical or Biochemical Engineering (1-5)
Internship—3-5 hours. Prerequisite: completion of a minimum of 84 units; project approval before period of internship, consent of instructor. Supervised work experience in Chemical or Biochemical. May be repeated for credit when project differs. Offered irregularly. (P/NP grading only.) GE credit: SE.—I, II, III, IV, (I, II, III, IV).

193. Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.—I, II, III, (I, II, III). (change in existing course—eff. winter 13)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.—I, II, III, (I, II, III). (change in existing course—eff. winter 13)

Engineering: Chemical and Materials Science

New and changed courses in Engineering: Chemical and Materials Science (ECM)

Lower Division
5. Analysis in Biochemical, Chemical and Materials Engineering (2)
Lecture/discussion—2 hours. Prerequisite: Chemistry 2B (may be taken concurrently), Mathematics 21B (may be taken concurrently), Analysis of systems of interest to chemical engineers and materials scientists. Applications of differential and integral calculus, dimensional analysis. GE credit: SciEng | QI, SE.—II, (II)

6. Computational Methods for Bio/Chemical/Materials Engineers (4)

Upper Division
199A-R. Special Topics in ECM (1-5)
Lecture and/or laboratory. Prerequisite: consent of instructor. Special topics in (A) Fluid Mechanics; (B) Nonlinear Analysis and Numerical Methods; (C) Process Control; (D) Chemistry of Catalytic Processes; (E) Biotechnology; (F) Interfacial Engineering; (G) Thermodynamics; (H) Membrane Separations; (I) Novel Experimental Methods; (J) Transport Phenomena; (K) Biomedical Engineering (L) Electronic Materials; (M) Ceramics and Engineering; (N) Physics and Chemistry of Materials; (O) Materials Processing; (P) Materials Science and Forensics; (Q) Biomedical Engineering; (R) Surface Chemistry of Metal Oxides. May be repeated for credit when topic differs. Offered irregularly. GE credit: SciEng | SE.—I, II, III, (I, II, III). (new course—eff. winter 13)

194A. Special Study for Honors Students (2)
Independent study—6 hours. Open to only students enrolled in the Chemical Engineering or Biochemical Engineering Honors Programs. Guided independent study of a selected topic in Chemical Engineering or Biochemical Engineering. Preparation for course 194BH. GE credit: SciEng | SE.—I, II, III, (I, II, III, IV)

194BH. Special Study for Honors Students (1-5)
Independent study—3 hours. Prerequisite: course 194A. Open to only students enrolled in the Chemical Engineering or Biochemical Engineering Honors Programs. Guided independent study of a selected topic in Chemical Engineering or Biochemical Engineering. Preparation for course 194HC. May be repeated for credit. GE credit: SciEng | SE.—I, II, III, (I, II, III).

194HC. Special Study for Honors Students (1-5)
Prerequisite: course 194BH; open only to students enrolled in the Chemical Engineering or Biochemical Engineering Honors Programs. Guided independent study of a selected topic in Chemical Engineering or Biochemical Engineering leading to the presentation of an honors project under the supervision of a faculty adviser. GE credit: SciEng | QI, SE.—I, II, III, (I, II, III).

Engineering: Civil and Environmental

New and changed courses in Engineering: Civil and Environmental (ECI)

Lower Division
3. Introduction to Civil and Environmental Engineering Systems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Mathematics 21A (may be taken concurrently). Restricted to lower division students; Civil Engineering majors during Pass 1. Introduction to civil engineering systems. General view of the engineering process as obtained by participation in laboratory experiments illustrative of the solution of representative, but simplified, engineering problems. Not open for credit to upper division students. GE credit: SciEng | QI, SE.—I, II, III, (I, II, III)

16. Spatial Data Analysis (2)
Lecture—1 hour; laboratory—3 hours. Restricted to Civil Engineering and Biological Systems Engineering majors; non-majors accommodated on a space-available basis. Computer-aided design and geographic information systems in civil engineering practice. GE credit: SciEng | QI, SE.—III, (III)

17. Surveying (2)
Lecture—2 hours. Prerequisite: Physics 9A (may be taken concurrently). Restricted to Civil Engineering and Biological Systems Engineering majors. Non-majors accommodated on a space-available basis. Theory behind and description of modern methods of land surveying in Civil Engineering. GE credit: SciEng | SE

Upper Division
119. Parallel Processing for Engineering Applications (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C programming or consent of instructor. Fundamentals in parallel computing for engineering applications; emphasis on structured parallel programming for distributed memory parallel clusters. Not open for credit to students who have completed 119B. Offering in alternate years. GE credit: SciEng | SE.—I, II, III, (I, II, III)

125. Building Energy Performance (4)
Lecture—4 hours. Prerequisite: upper division standing in Engineering. Open to students in the College of Engineering. Mechanisms of energy consumption in buildings including end uses, thermal loads, ventilation, air infiltration, thermal energy distribution, thermal storage, HVAC systems, and building codes. GE credit: SciEng | SE
126. Integrated Planning for Green Civil Systems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Physics 9C or Landscape Architecture 60 or Design 14.5 or Environmental Science and Policy 100 or Nature and Culture 120 or Anthropology 100 or Statistics 32 or Plant Sciences 101; consent of instructor. Working within multidisciplinary teams, a heuristic, learning environment, and multiple realistic constraints, an integrated design process will be applied to the planning of a project-based green and sustainable civil system. GE credit: SciEng | SE.—I. (I.) Modera
(change in existing course—eff. winter 13)

127. Integrated Design for Green Civil Systems: Senior Design Experience (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 126; consent of instructor. Restricted to senior level standing. Working within multidisciplinary teams and a heuristic, project-based learning environment, an integratable civil system will be designed. Evaluate various design options under architectural, structural, cost and environmental constraints, and present designs through oral and written presentations. GE credit: SciEng | SE.—II. (II.) Kendall, Loge
(change in existing course—eff. fall 12)

128. Integrated Construction for Green Civil Systems (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 127. Working within multidisciplinary teams, a heuristic, learning environment, and multiple realistic constraints, an integrated design process will be applied to the construction of a project-based green and sustainable civil system. Offered irregularly. GE credit: SciEng | SE—Kendall, Loge
(change in existing course—eff. winter 14)

130. Structural Analysis (4)
Lecture—4 hours. Prerequisite: C- or better in Engineering 104; Mathematics 22A. Open to Civil Engineering majors. Elastic structural analysis of determinate and indeterminate trusses, beams and frames. Elastic bending and limit analysis. GE credit: SciEng | SE.—I. (I.) Schladow, Younis
(change in existing course—eff. fall 13)

131. Matrix Structural Analysis (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in Engineering 104; Engineering 6. Open to Engineering majors only. Matrix formulation and computer analysis of statically indeterminate structures. Stiffness and flexibility formulations for elastic structures. Finite element methods for elasticity and bending problems. Offered irregularly. GE credit: SciEng | SE.—I.
(change in existing course—eff. fall 13)

132. Structural Design: Metallic Elements (4)
Lecture—4 hours. Prerequisite: course 130. Design of metallic beams, columns, and other members for various types of loading and boundary conditions; design of connections between members; member performance within structural systems. GE credit: SciEng | SE—VL.—II. (II.) Bolander, Kanvinde
(change in existing course—eff. fall 13)

135. Structural Design: Concrete Elements (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 130. Restricted to Civil Engineering, Civil Engineering/ArtSci, Science and Engineering, and Materials Science and Engineering majors only. Strong design procedures for columns, rectangular beams, Tbeams and beams of general cross-section. Building code requirements for bending, shear, axial

and HVAC systems; energy performance simulation; methods and strategies for energy efficiency. GE credit: SciEng | SE.—II. (II.) Schladow, Younis
(change in existing course—eff. winter 13)

136. Building Design: Senior Design Experience (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 130 or 131; course 135 or 132. Restricted to senior level standing. Design of a building structure for a specific need under the multiple constraints of serviceability, safety, serviceability, and costs. Offered irregularly. GE credit: SciEng | SE
(change in existing course—eff. fall 13)

137. Construction Principles and Project Management (4)
Lecture—3 hours; laboratory—3 hours. Restricted to upper division standing in Engineering. Project management, with civil engineering construction and design applications, including project scope, schedule, resources, cost, quality, risk, and control. Construction industry, team building, planning, design, construction, operations. Construction operations analysis. Contract issues. Project management software, field trips, guest lectures. Offered irregularly. GE credit: SciEng | SE—ScE, VL.—II. (II.) Harvey
(change in existing course—eff. fall 13)

138. Earthquake Loads on Structures (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 130 or 131. Determination of loads on structures due to earthquake. Methods of estimation of equivalent static lateral forces; response spectrum and time history analysis. Concepts of mass, damping and stiffness for typical structures. Design for inelastic behavior. Numerical solutions and Code requirements. GE credit: SciEng | SE.—II. (II.) Kunath
(change in existing course—eff. fall 13)

139. Advanced Structural Mechanics (4)
Lecture—4 hours. Prerequisite: C- or better in Engineering 104. Review of stress, strain, equilibrium, compatibility, and elastic material behavior. Plane stress and plane strain problems in elasticity; energy methods. Theories for unsymmetrical bending, straight and curved beams. Beams on elastic foundations; stresses in plates and shells, elastic stability. GE credit: SciEng | SE—ScE, VL.—II. (II.) Chirumamula
(change in existing course—eff. fall 13)

140. Environmental Analysis of Aqueous Systems (3)
Lecture—3 hours. Prerequisite: Chemistry 2B. Introduction to chemical principles underlying current practices in sampling and analysis of water and wastewater. Offered irregularly. GE credit: SciEng | SE—I. (I.) Young
(change in existing course—eff. fall 13)

140L. Environmental Analysis of Aqueous Systems Laboratory (1)
Laboratory—3 hours. Prerequisite: Chemistry 2B or the equivalent course 140 (may be taken concurrently). Restricted to Civil Engineering undergraduate and graduate students. Introduction to "wet chemical" and instrumental techniques commonly used in the examination of water and wastewater and associated data analysis. GE credit: SciEng | SE
(change in existing course—eff. winter 13)

141. Engineering Hydraulics (3)
Lecture—3 hours. Prerequisite: C- or better in Engineering 103. Nature of flow of a real fluid, flow in pipes; open channel flow; turbomachinery; fluid forces on objects; boundary layers, lift and drag. GE credit: SciEng | SE—ScE, VL.—II. (II.) Bommerdell, Schladow, Younis
(change in existing course—eff. fall 13)

141L. Engineering Hydraulics Laboratory (1)
Laboratory—3 hours. Prerequisite: course 141 (may be taken concurrently). Open to Engineering students only. Laboratory experiments and demonstrations on flow measurement, sluice gates, hydraulic jumps, flow characteristics, energy, pumps and turbines. GE credit: SciEng | SE—ScE, VL.—I. (I.) Schladow, Younis
(change in existing course—eff. winter 13)

142. Engineering Hydrology (4)
(change in existing course—eff. fall 13)

143. Green Engineering Design and Sustainability (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing. Restricted to Civil Engineering undergraduate and Engineering majors only. Application of concepts, goals, and metrics of sustainability, green engineering, and industrial ecology to the design of engineering systems. Life cycle analyses, waste audit and environmental management systems, economics of pollution prevention and sustainability, and substitute materials for products and processes. GE credit: SciEng | VL.—II. (II.) Loge
(change in existing course—eff. winter 12)

144. Groundwater Systems Design (4)
Lecture—4 hours. Prerequisite: course 141. Groundwater occurrence, distribution, and movement; groundwater flow systems; radial flow to wells and aquifer testing; aquifer management; groundwater contamination; solute transport by groundwater; fate and transport of subsurface contaminants. Groundwater supply and transport modeling. GE credit: SciEng | SE—Ginn
(change in existing course—eff. winter 13)

145. Hydraulic Structure Design: Senior Design Experience (4)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: C- or better in Engineering 103. Restricted to senior level standing. Project-based course covering the design of an integrated urban drainage system, including consideration of design alternatives, multiple realities and constraints (environmental, health), quantification of hydrologic uncertainty, codes and standards, design drawings and specifications. Offered irregularly. GE credit: SciEng | SE.—Younis
(change in existing course—eff. fall 13)

146. Water Resources Simulation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103. Computer simulation techniques in the analysis, design and operation of surface water systems; modeling concepts and practices with application to surface runoff, water quality in rivers and streams and dispersion of contaminants in water bodies. GE credit: SciEng, Wrt | SE.—II. (II.) Younis
(change in existing course—eff. fall 13)

148A. Water Quality Management (4)
Lecture—4 hours. Prerequisite: C- or better in Chemistry 2B. Basic concepts of water quality measurement and regulations. Introduction to physical, biological and chemical processes in natural waters. Fundamentals of mass balances in water and wastewater treatment. GE credit: SciEng | SE—II. (II.) Wuerzt, Young
(change in existing course—eff. fall 13)
148B. Water and Wastewater Treatment System Design: Senior Design Experience (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in Engineering 103 and course 148A. Restricted to senior level standing. Design and evaluation of wastewater treatment systems. GE credit: SciEng | QL, SE, VL, WE.—III. (III.) Darby (change in existing course—eff. fall 13)

149. Air Pollution (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 21D, 22B, Chemistry 28B, Atmospheric Science 121A or Engineering 103. Physical and technical aspects of air pollution. Emphasis on geo-physical processes and air pollution meteorology as well as physical and chemical properties of pollutants. (Same course as Atmospheric Science 149.) GE credit: SciEng | QL, SE, SL.—III. (III.) Cappa (change in existing course—eff. winter 13)

150. Air Pollution Control System Design: Senior Design Experience (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103, 105, 106; course 149. Restricted to senior level standing. Design and evaluation of air pollution control equipment and systems. GE credit: SciEng | SE.—II. (II.) Cappa (change in existing course—eff. winter 14)

153. Deterministic Optimization and Design (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Mathematics 21C and 22A; computer programming course. Operations research. Optimization techniques such as linear programming, dynamic programming, and non-linear programming. Applications in civil engineering disciplines, including multiple realistic constraints, through computer-based course projects. GE credit: SciEng | QL, SE, SL.—I. (I.) Fan (change in existing course—eff. fall 13)

155. Water Resources Engineering Planning (4)
Lecture—4 hours. Prerequisite: Engineering 106 or Economics 1A; course 114. Basic engineering planning concepts of role of engineering, economic, environmental and social information and analysis; institutional, political and legal aspects. Course studies and computer models illustrate the planning of water resource systems. GE credit: SciEng or SocSci, Wrt | QL, SE or SS, SL, WE.—III. (III.) Lund (change in existing course—eff. fall 13)

161. Transportation System Operations (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 6 (or the equivalent) and 102. Principles of transportation system operations; traffic data collection and methods of measurement; models of transportation operations and congestion applied to urban streets and freeways. GE credit: SciEng | QL, SE.—I. (I.) Zhang (change in existing course—eff. fall 13)

162. Transportation Land Use Sustainable Design: Senior Design Experience (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in course 161 or 163. Restricted to senior level standing. Interactions between land use and transportation systems design. Generalized design paradigms; computer-based solutions for transportation land use. Students will select from various strategies to satisfy multiple constraints including cost, effectiveness and environmental sustainability. Oral, poster and written presentations required. GE credit: SciEng | SE, SL.—III. (III.) Niemeier (change in existing course—eff. fall 13)

163. Energy and Environmental Aspects of Transportation (4)
Lecture—3 hours; extensive writing. Prerequisite: Economics 1A or Engineering 106. Engineering, economic, and systems planning concepts. Analysis and evaluation of energy, air quality and selected environmental attributes of transportation technologies. Strategies for reducing pollution and petroleum consumption in light of institutional and political constraints. Evaluation of vehicle emission models. (Same course as Environmental Science and Policy 162.) GE credit: SciEng or SocSci, Wrt | SE or SS, SL, WE.—I. (I.) Spertling (change in existing course—eff. winter 14)

165. Transportation Policy (3)
Lecture—3 hours. Transportation and associated environmental problems confronting urban areas, and prospective technological and institutional solutions. Draws upon concepts and methods from economics, engineering, political science and environmental studies. Offered in alternate years. GE credit: SciEng or SocSci, Wrt | QL, SE or SS.—I. (I.) Spertling (change in existing course—eff. fall 13)

171. Soil Mechanics (4)
Lecture—4 hours. Prerequisite: C- or better in Engineering 104; Engineering 105 (may be concurrent); course 171L (co-requisite). Restricted to Civil Engineering and Civil Engineering/Materials and Science and Engineering majors only. Soil formations, mass-volume relationships, soil classification, effective stress, soil-water-void relationships, compaction, seepage, capillarity, compressibility, consolidation, strength, stress and strain, lateral earth pressures, and slope stability. GE credit: SciEng | QL, SE.—I. (I.) Kutter (change in existing course—eff. fall 13)

171L. Soil Mechanics Laboratory (1)
Laboratory—3 hours. Prerequisite: course 171 must be taken concurrently. Laboratory studies utilizing standard testing methods to determine physical, mechanical and hydraulic properties of soil and demonstration of basic principles of soil behavior. GE credit: SciEng | SE.—I. (I.) Kutter (change in existing course—eff. winter 13)

173. Foundation Design: Senior Design Experience (4)
Lecture—4 hours. Prerequisite: course 171. Restricted to senior level standing. Soil exploration and determination of properties for design; design of shallow and deep foundations for bearing capacity and settlements; design of retaining structures; selection and evaluation of foundation alternatives; excavation support and dewatering; major design experience and design report preparation. GE credit: SciEng | SE.—I. (I.) Boulanger (change in existing course—eff. fall 13)

175. Geotechnical Earthquake Engineering (4)
Lecture—4 hours. Prerequisite: C- or better in course 171. Earthquake sources and ground motions. Cyclic behavior of soils; triggering, consequences, and mitigation of effects of liquefaction. NEES (Net-work for Earthquake Engineering Simulation) equipment and techniques for studying earthquake engineering with focus on liquefaction problems. GE credit: SciEng | QL, SE.—I. (I.) Idriss, Kutter (change in existing course—eff. fall 13)

179. Pavement Engineering (4)
Lecture—3 hours; discussion/laboratory—3 hours. Prerequisite: C- or better in Engineering 104. Pavement types (rigid, flexible, unsurfaced, rolled), their applications (roads, airfields, ports, rails) and distress mechanisms. Materials, traffic and environmental characterization. Empirical and mechanistic-empirical design procedures. Maintenance, rehabilitation and reconstruction; construction quality; asphalt concrete mix design. GE credit: SciEng | QL, SE, VL.—I. (I.) Harvey (change in existing course—eff. fall 13)

189A-J. Selected Topics in Civil Engineering (1-5)
Prerequisite: consent of instructor. Directed group study of selected topics with separate sections in (A) Environmental Engineering; (B) Hydraulics and Hydrologic Engineering; (C) Engineering Planning; (D) Geotechnical Engineering; (E) Structural Engineering; (F) Transportation Engineering; (G) Water Resources Engineering; (H) Water Resources Planning. May be repeated for credit when the topic is different. GE credit: SciEng | SE.—I., II., III. (I., I., III., I.) Nunneth (new course—eff. fall 13)

190C. Research Group Conferences in Civil and Environmental Engineering (1-5)
Discussion—1 hour. Prerequisite: upper division standing in Civil and Environmental Engineering; consent of instructor. Research group conferences. May be repeated for credit. (P/NP grading only.) GE credit: SE.—I., II., III. (I., I., III., I.) Nunneth (change in existing course—eff. winter 13)

192. Internship in Engineering (1-5)
Internship. Prerequisite: upper division standing; approval of project prior to the period of the internship. Supervised work experience in civil engineering. May be repeated for credit. (P/NP grading only.) GE credit: SE (change in existing course—eff. winter 13)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE (change in existing course—eff. winter 13)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: senior standing in engineering and at least a B average. (P/NP grading only.) GE credit: SE (change in existing course—eff. winter 13)

Graduate

213. Analysis of Structures Subjected to Dynamic Loads (4)
Lecture—4 hours. Prerequisite: course 211 may be taken concurrently. Analysis of structures subjected to earthquake, wind and blast loading; distributed, consistent and lumped mass techniques; computer implementation; nonlinear response spectrum; frequency and time domain analysis; seismic protection of structures; numerical methods in linear and nonlinear structural dynamics.—I. (I.) Nunneth (change in existing course—eff. fall 13)

254. Discrete Choice Analysis of Travel Demand (4)
Lecture—4 hours. Prerequisite: course 114, Behavioral and statistical principles underlying the formulation and estimation of discrete choice models. Practical application of discrete choice models to characterization of choice behavior, hypothesis test- ing, and forecasting. Emphasis on computer exer- cises using real-world data sets. (Same course as Geography 279.)—III. (III.) Mokhtarian (change in existing course—eff. fall 12)

267. Water Resource Management (3)
Lecture—3 hours. Prerequisite: course 114, 141, and 142; course 153 recommended. Engineering, institutional, economic, and social basis for manag-
Engineering: Computer Science

New and changed courses in Engineering: Computer Science (ECS)

10. Introduction to Programming (4)
   Lecture—3 hours, discussion—1 hour. Prerequisite: two years of high school algebra. A hands-on intro-
   (change in existing course—eff. winter 14)

12. Introduction to Media Computation (4)
   Lecture—3 hours, discussion/laboratory—1 hour. Introduction to key computational ideas necessary to
   understand and produce digital media. Fundamen-
   tals of programming are covered as well as analysis
   of how media are represented and transmitted in
digital form. Aimed primarily at non-computer sci-
ence students. (Same course as Cinema and Techno-
cultural Studies 012.) GE credit: ArtHum or SciEng | AH or SE, VL—I. (II.) Neff
   (new course—eff. fall 13)

15. Introduction to Computers (4)
   Lecture—3 hours; laboratory—3 hours. Not open for credit to students who have completed course 30.
   Computer uses in modern society. Emphasis on uses in non-scientific disciplines. Includes word pro-
   cessing, spreadsheets, web-page creation, elementary pro-
   gramming, basic computer organization, the Internet, the uses of computers and their influence on
   society. Course not intended for CS or CSE majors. Only two units of credit allowed to students who have
   (change in existing course—eff. fall 13)

20. Discrete Mathematics for Computer Science (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: grade of C or better in Mathematics 16A, 17A or
   21A. Discrete mathematics of particular utility to computer science. Proofs by induction. Propositional
   and first-order logic. Sets, functions, and relations. Big-O and related notations. Recursion and solutions
   of recurrence relations. Combinatorics. Probability on finite probability spaces. Graph theory. GE
   credit: SciEng | QL, SE—I, II, III. (II, III) Bai, Gusfield, Levit, Martel, Rogaway
   (change in existing course—eff. winter 14)

30. Programming and Problem Solving (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 16A or 21A (may be taken concur-
   rently); prior experience with basic programming
   concepts (variable, loops, conditional statements) recommended. Introduction to computers and com-
   puter programming, algorithm design, and debug-
   ging. Elements of good programming style. Programming in C language. Use of basic UNIX
   (change in existing course—eff. fall 13)

40. Software Development and Object-
   Oriented Programming (4)
   Lecture—3 hours, discussion—1 hour. Prerequisite: course 30 or the equivalent with a grade of C or
   better. Elements of program design, style, documen-
   tation, efficiency. Methods for debugging and verifi-
   cation. Operating system tools. Principles and use of
   object-oriented programming in C++. Basic data
   structures and their use. GE credit: SciEng | SE,
   VL—I, II, III. (II, III, IV.)
   (change in existing course—eff. spring 13)

50. Computer Organization and Machine-
   Dependent Programming (4)
   Lecture—3 hours, discussion—1 hour. Prerequisite:
   course 40. Comparative study of different hardware
   architectures via programming in the assembly lan-
   guages of various machines. Role of system software
   in producing an operating system. Introduction to
   I/O devices and programming. Only one unit of credit
   allowed for students who have taken Electrical and
   Computer Engineering 70. GE credit: SciEng | QL,
   SE—I, II, III. (II, III) Jaillet, Matloff
   (change in existing course—eff. winter 14)

60. Data Structures and Programming (4)
   Lecture—3 hours, discussion—1 hour. Prerequisite:
   courses 20, 40 (C++ and UNIX); grade of C or bet-
   ter in each course. Design and analysis of data struc-
   tures for a variety of applications. Trees, heaps,
   searching, sorting, hashing, graphs. Extensive pro-
   gramming. GE credit: SciEng | QL, SL—I, II, III. (II,
   III) Rogaway
   (change in existing course—eff. winter 14)

9A-L. Special Topics in Computer Science (1-5)
   Lecture, laboratory or combination. Prerequisite:
   consent of instructor. Special topics in [A] Computer
   Science Theory; [B] Algorithms; [C] Programming
   Languages and Compilers; [D] Operating Systems;
   [E] Software Engineering; [F] Databases; [G] Artifi-
   cial Intelligence; [H] Computer Graphics; [I] Net-
   works; [J] Computers in Other Disciplines; [K] Sci-
   entific Computing, [L] Computer Science. May be
   repeated for credit when the topic is different.
   (change in existing course—eff. winter 13)

Upper Division

120. Theory of Computation (4)
   Lecture—3 hours, discussion—1 hour. Prerequisite:
   course 20 or Mathematics 108. Fundamental ideas
   in the theory of computation, including formal lan-
   guages, computability and complexity. Reducibility
   among computational problems. GE credit: SciEng
   | QL, SE—I, II, III. (II, III) Bai, Franklin, Gusfield, Martel, Rogaway
   (change in existing course—eff. winter 14)

122A. Algorithm Design and Analysis (4)
   Lecture—3 hours, discussion—1 hour. Prerequisite:
   courses 20, 60. Complexity of algorithms, bounds
   on complexity, analysis methods. Searching, sorting,
   pattern matching, graph algorithms. Algorithm-
   design techniques: divide-and-conquer, greedy, dynamic
   programming. Approximation methods. NP-comple-
   tete problems. GE credit: SciEng | SE—I, II, III. (II,
   III) Amenta, Filkov, Franklin, Gusfield, Martel, Rogaway
   (change in existing course—eff. winter 14)

2012-2014 General Catalog Course Supplement and Policies and Requirements Addendum

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; Wrt—Writing Experience

Fall 2011 and on General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OLT—Oral Skills, QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; Wrt—Writing Experience
140B. Programming Languages (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 140A. Continuation of programming lan-
guage principles. Further study of programming lan-
guage paradigms such as functional and logic;
additional programming language paradigms such as
current generation; key implementation issues
for those paradigms; and programming language
semantics. Offered in alternate years. GE credit:
SciEng | SE.—(II.) Levitt, Olsson, Pandey
(change in existing course—eff. winter 14)

142. Compilers (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 20, 140A, 120 recommended. Princi-
practices and techniques of lexical analysis, parsing,
semantic analysis, code generation, and code opti-
mization. Implementation of compilers. GE credit:
SciEng | SE.—(II, III.) Pandey
(change in existing course—eff. winter 14)

145. Scripting Languages and Their
Applications (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
programming skill at the level of course 60. Goals
and philosophy of scripting languages, with Python
and PHP as prime examples. Applications include
web working, data analysis and display, and graphical
user interfaces (GUIs). Offered in alternate years.
GE credit: SciEng | SE.—III. Matloff
(change in existing course—eff. winter 14)

150. Operating Systems and System
Programming (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 40, course 50 or Electrical and Computer
Engineering 70. Basic concepts of operating systems
and system programming. Processes and interpro-
cess communication/synchronization; virtual mem-
ory, program loading and linking. Ile and I/O
subsystems; utility programs. Study of a real operat-
Levitt, Matloff, Olsson, Wu
(change in existing course—eff. winter 14)

152A. Computer Networks (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 60; course 132 or Electrical and Computer
Engineering 161 or Mathematics 135A or Statistics
131A, or Statistics 120 or Statistics 32. Overview of
computer networks, TCP/IP protocol suite, computer-
networking applications, and protocols, transport-
layer protocols, network architectures, Internet Proto-
col (IP), routing, link-layer protocols, local area and
wireless networks, medium access control, physical
aspects of data transmission, and network perfor-
amance analysis. Only 2 units of credit for students
who have taken course 157. [Same course as Elec-
trical and Computer Engineering 173A.] GE credit:
Matloff, Mohapatra, Mukherjee
(change in existing course—eff. fall 13)

152B. Computer Networks (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 152A or Electrical and Computer Engineer-
ing 173A. TCP/IP protocol suite, computer
networking applications, and protocols, transport-
layer protocols, transport-layer interfaces, sockets,
network programming, remote procedure calls, and
network management. GE credit: SciEng | SE.—I, II,
III, (I, II, III.) Ghosal, Matloff, Mohapatra, Mukherjee
(change in existing course—eff. winter 14)

152C. Design Projects in Communication
Networks (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 152A or Electrical and Computer Engineer-
ing 173A. Advanced topics and design projects in
communication networks. Example topics include
wireless networks, multimedia networking, network
design and management, traffic analysis and model-
ning, network simulations and performance analysis.
Offered in alternate years. [Same course as Elec-
trical and Computer Engineering 173B.] GE credit:
SciEng | SE.—(III.) Chuah, Liu, van der Schaar,
Mukherjee
(change in existing course—eff. winter 13)

153. Computer Security (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
courses 150 and 152A. Principles, mechanisms,
and implementation of computer security and data
protection. Policies for access control, integrity,
confidentiality, and nonrepudiation. GE credit:
SciEng | SE.—II, III. (II, III.) Bishop, Chen
(change in existing course—eff. winter 13)

154A. Computer Architecture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 50 or Electrical and Computer Engineering
70. Introduction to digital design. Interfacing of
devices for I/O, memory and memory management.
Input/output programming, via wait loops, hard-
ware interrupts and calls to operating system ser-
dices. Handwriting software for operating systems.
Farrens, Mukherjee
(change in existing course—eff. winter 14)

155. Computer Security for Non-Majors (4)
(canceled course—eff. winter 14)

156. Discrete-Event Simulation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 140A. Discrete-event simulation with special
emphasis on simulation of queueing systems, net-
work and computer systems, population systems,
and other simulation paradigms. GE credit:
(change in existing course—eff. winter 13)

157. Software Engineering (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 140A. Requirements specification, design,
implementation, testing, and verification of large
software systems. GE credit: SciEng | SE.—I, II, III.
Ludaescher
(change in existing course—eff. winter 13)

158. Programming on Parallel
Architectures (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
courses 150 and 154A recommended. Techniques
for software development using the shared-memory
and message-passing paradigms, on parallel archi-
tectures and networks of workstations. Locks, barri-
ers, and other techniques for synchronization.
Introduction to parallel algorithms. GE credit:
SciEng | SE.—I, II, III. (I, II, III.) Chong, Farrens, Ma,
Matloff, Pandey
(change in existing course—eff. fall 13)

160. Software Engineering (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 140A. Requirements, specification, design,
implementation, testing, and verification of large
software systems. Study and use of software engi-
neering methodologies. GE credit: SciEng | SE.—I, II,
III, (I, II, III.) Devanbu, Lev-
(it
(change in existing course—eff. winter 14)

163. Information Interfaces (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 60. Art and science of information visualiza-

170. Introduction to Artificial Intelligence
(Lecture—3 hours; discussion—1 hour. Prerequisite:
course 140A. Design and implementation of intelli-
gent computer systems. Knowledge representation
and organization, knowledge acquisition, problem
solving. Natural language processing. GE credit:
(change in existing course—eff. winter 13)

171. Machine Learning (4)
Lecture—3 hours; discussion—1 hour. Introduction to
machine learning. Supervised and unsupervised
learning, including classification, regression, feature
reduction, regression and clustering using modern
machine learning methods. Applications of machine
learning to other fields. GE credit: SciEng | SE.—I,
II, III. (I, II, III.) Davidson, Matloff, Tzoukalas
(new course—fall 13)

173. Image Processing and Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 60. Mathematics 67 or C or better. Math-
ematics 22A. Techniques for automated extraction of
high-level information from images generated by
cameras, three-dimensional surface sensors, and
medical devices. Typical applications include detec-
tion of objects in various types of images and
describing populations of biological specimens
appearing in medical imagery. GE credit:
(change in existing course—eff. winter 14)

175. Computer Graphics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 60; Mathematics 22A or Mathematics 67.
Principles of computer graphics, with focus on
interactive systems. Current graphics hardware, ele-
mentary operations in two and three-dimensional space,
geometric transformations, camera models and
interaction, graphics system design, traditional graph-
ics APIs, individual projects. GE credit:
(change in existing course—eff. winter 14)

177. Scientific Visualization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 175. Computer graphics techniques for gen-
erating images of various types of measured or com-
puter-simulated data. Typical applications for these
graphics techniques include study of air flows
around car bodies, medical data, and molecular
structures. GE credit: SciEng | SE.—I, II, III.
Hamann, Joy, Max, Staudt
(change in existing course—eff. winter 14)
178. Geometric Modeling (4) Lecture—3 hours, discussion—1 hour. Prerequisite: course 175. Involves geometric techniques for defining and manipulating geometrical shapes used in computer animation, car body design, aircraft design, and architectural design. GE credit: SciEng | SE.—I, II. (I) O'Driscoll, Joy, Max
(change in existing course—eff. winter 14)

(change in existing course—eff. winter 14)


193A. Senior Design Project (2) Lecture—1 hour; laboratory—3 hours. Prerequisite: course 160 recommended (may be concurrent) or consent of instructor. Open to Computer Science or Computer Science and Engineering seniors. Team design project involving technology, kinematics, and implementation and evaluation of a large scale problem involving computer and computational systems. The project is supervised by a faculty member. Students must take course 193A and 193B to receive credit. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—I, II, III. (II, III.)

Graduate

(new course—eff. fall 13)

Engineering: Electrical and Computer

New and changed courses in Engineering: Electrical and Computer (EEC)

Lower Division

1. Introduction to Electrical and Computer Engineering (I) Lecture—1 hour. Electrical and Computer Engineer- ing as a professional activity. What Electrical and Computer Engineers know and how they use their knowledge. (P/NP grading only.) GE credit: SciEng | SE.—I. (I)
(change in existing course—eff. winter 13)

10. Introduction to Digital and Analog Systems (3) Lecture—1 hour, laboratory—3 hours. Prerequisite: Engineering 6 or Mathematics 22A/L. Computer Sci- ence Engineering 30, Physics 9C and Engineering 17 (concurrent enrollment in Engineering 17 allowed). Open to Electrical and Computer Engineer- ing sophomores. Interactive and practical intro- duction to fundamental concepts of electrical and computer engineering by implementing electronic systems, which can be digitally controlled and inter- rogated, with a programmable microcontroller with the ability to program the electrical connections between analog and digital components. GE credit: SciEng | SE.—III. (III.) Knoesen
(change in existing course—eff. winter 13)

70. Computer Structure and Assembly Language (4) Lecture or workshop—1 hour. Prerequisite: Computer Science Engineering 30. Computer archi- tecture, machine language, assembly language, macros and conditional macros; subroutine/parama- ter passing, input/output programming, interrupt and trap; direct-memory-access; absolute and relocatable code; re-entrantr deode; program development in an operating system. Only one unit of credit to students who have completed Computer Science Engineering 50. GE credit: SciEng | SE.—I, II, III. (II, III.) Akella, Al- Asaad, Chua, Wilken
(change in existing course—eff. winter 13)

89A-F. Special Topics in Electromagnetics (1-5) Prerequisite: consent of instructor. Special Topics in (A) Electromagnetics, (B) Physical Electronics, (C) Active and Passive Devices, (E) Computer Systsemics and Software, (F) Digital System Design for freshmen and sophomore level students. May be repeated for credit if topic differs. Offered irregularly. GE credit: SciEng | SE.—I, II, III. (I, II, III.)

119A. Integrated Circuit Design Project (3) Lecture—3 hours, discussion—1 hour. Prerequisite: course 119A. Design course involving architecture, circuit design, physical design, and validation through extensive simulation of a digital or mixed-signal integrated circuit of substantial complexity under given design constraints. Team project that includes central report. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—I, II. (I, II.)

119B. Integrated Circuit Design Project (2) Workshop—1 hour; laboratory—3 hours. Prerequi- site: course 119A. Design course involving architecture, circuit design, physical design, and validation through extensive simulation of a digital or mixed-signal integrated circuit of substantial complexity under given design constraints. Team project that includes a final report. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—I. (I.)

(change in existing course—eff. winter 13)

130B. Introductory Electromagnetics II (4) Lecture—3 hours, discussion—1 hour. Prerequisite: course 130A. Plane wave propagation in lossy media, reflections, guided waves, simple modulated waves and dispersion, and basic antennas. GE credit: SciEng | SE.—III. (III.) Knoesen, Pham, Yoo
(change in existing course—eff. winter 13)

132A. RF and Microwave in Wireless Communication (5) Lecture—3 hours, laboratory—3 hours; discussion—1 hour. Prerequisite: course 110B, 130B, 140B. The study of Radio Frequency and Microwave theory and practice for design of wireless electronic systems. Transmission lines, microwave integrated cir-
145. Electronic Materials (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 140A. Basic fabrication processes for Metal Oxide Semiconductor (MOS) integrated circuits. Laboratory assignments covering oxidation, photolithography, impurity diffusion, metallization, wet chemical etching, and characterization work together in grading standard MOS test chips which will undergo parametric and functional testing. GE credit: ScEng | SE.—I. (I.) Hiltach, Hunt, Islam, Kiehl, Seker (new course—eff. spring 13)

146A. Integrated Circuits Fabrication (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: course 140A. Basic fabrication processes for Metal Oxide Semiconductor (MOS) integrated circuits. Laboratory assignments covering oxidation, photolithography, impurity diffusion, metallization, wet chemical etching, and characterization work together in grading standard MOS test chips which will undergo parametric and functional testing. GE credit: ScEng | SE.—I. (I.) Hiltach, Hunt, Islam, Kiehl, Seker (new course—eff. fall 13)

146B. Advanced Integrated Circuits Fabrication (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: course 146A. Restricted to Electrical, Computer, and Electrical/Materials Science majors and Electrical Engineering graduate students. Students work in a group on a one-semester module project. Course work includes: photolithography, impurity diffusion, metallization, wet chemical etching, and characterization work together in grading standard MOS test chips which will undergo parametric and functional testing. GE credit: ScEng | SE.—II. (II.) Pham (change in existing course—eff. winter 13)

146C. RF and Microwave in Wireless Communications (5) Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 140A. RF and microwave amplifier theory and design, including transistor circuit models, stability considerations, noise models and low noise design. Theory and design of microwave transistor oscillators and mixers. Wireless system design and analysis. GE credit: ScEng | SE.—II. (II.) Branner, Luhmann (change in existing course—eff. winter 13)

133. Electromagnetic Radiation and Antenna Analysis (4) Lecture—3 hours; laboratory—1 hour. Prerequisites: course 140B. Properties of electromagnetic radiation; analysis and design of antennas: ideal cylindrical, small loop, aperture, and arrays; antenna field measurements. GE credit: ScEng | SE.—I. (I.) Knoesen (change in existing course—eff. winter 13)

136A. Electronic Design Project 3 (3) Workshop—1 hour; laboratory—8 hours. Prerequisite: Computer Science Engineering 30, courses 110A, 150A, 180A. Pass or fail only. Optimal, electrical and communication-engineering design of an opto-electronic system operating under performance and economic constraints. Measurement techniques will be designed and implemented, and the system will be characterized. GE credit: ScEng | SE.—III. (III.) Knoesen (change in existing course—eff. winter 13)

136B. Electronic Design Project 2 (3) Workshop—1 hour; laboratory—5 hours. Prerequisites: course 136A, course 123A. Optimal, electrical and communication-engineering design of an opto-electronic system operating under performance and economic constraints. Measurement techniques will be designed and implemented, and the system will be characterized. GE credit: ScEng | SE.—II. (II.) Pham (new course—eff. winter 13)

140A. Principles of Device Physics I (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 17; Physics 9D. Semiconductor device fundamentals, equilibrium and non-equilibrium statistical mechanics, conductivity, diffusion, electrons and holes, p-n and Schottky junctions, first-order metal-oxide-semiconductor (MOS) field effect transistors, bipolar junction transistor fundamentals. GE credit: SE, SL.—I. (I.) Fink, Hunt, Islam, Kiehl, Yankelevich (change in existing course—eff. winter 13)

140B. Principles of Device Physics II (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 140A. Electronic properties, designs, models and advanced concepts for MOS, Bipolar, and Junction Field Effect Transistors, including scaling, minority-carrier distributions, nonideal effects, and device fabrication methods. MESFET and heterojunction bipolar transistors (HBTs). Fundamentals of solar cells, photodetectors, LEDs and semiconductor lasers. GE credit: ScEng | SE, SL.—I. (I.) Hunt, Islam (change in existing course—eff. winter 13)
170. Introduction to Computer Architecture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 180A; course 70 or Computer Science Engineering 50. Introduces basic aspects of computer architecture, including computer performance measurement, instruction set design, computer arithmetic, pipelined/non-pipelined implementation, and memory hierarchies (cache and virtual memory). Presents a simplified Reduced Instruction Set Computer using logic design methods from the prerequisite course. GE credit: SciEng | SE.—I. (I.) Owens, Wilken.
(change in existing course—eff. winter 13)

171. Parallel Computer Architecture (4)
(change in existing course—eff. winter 13)

172. Embedded Systems (4)
Lecture—3; laboratory—4–6 hours. Prerequisite: course 170 or Computer Science Engineering 154A. Introduction to embedded-system hardware and software. Topics include: embedded processor and input/output hardware and software, including interrupts and direct memory access; interfacing with sensors and actuators; wired and wireless embedded networking. GE credit: SciEng | SE.—I. (I.II.) Akella, Ghiasi, Wilken.
(change in existing course—eff. fall 13)

173A. Computer Networks (4)
Lecture—3; discussion—1 hour. Prerequisite: Computer Science Engineering 60; Computer Science and Engineering 132 or Electrical and Computer Engineering 161 or Mathematics 125A or Statistics 131 or 132 or Statistics 134. Overview of computer networks, TCP/IP protocol suite, computer-networking applications and protocols, transport-layer protocols, network architectures, Internet services, virtual printers, routing, link-layer protocols, local area and wireless networks, medium access control, physical aspects of data transmission, and network performance analysis. Only 2 units of credit for students who received credit in course 157. (Same course as Computer Science Engineering 152A.) GE credit: SciEng | SE.—I. (I.II.) Ghiasi, Chau, Ghasal, Liu, Matloff, Mahapatra, Mukherjee.
(change in existing course—eff. fall 13)

173B. Design Projects in Communication Networks (4)
Lecture—3; discussion—1 hour. Prerequisite: course 173A or Computer Science and Engineering 152A. Advanced topics and design projects in communication networks. Example topics include wireless networks, multimedia networking, network design and management, traffic analysis and modeling, network simulations and performance analysis. Offered in alternate years. Same course as Computer Science Engineering 192C. GE credit: SciEng | SE.—I. (I.II.) Chau.
(change in existing course—eff. winter 13)

180A. Digital Systems I (5)
Lecture—3 hours; laboratory—6 hours. Prerequisite: Physics 9C. Introduction to digital system design including combinational logic design, sequential and asynchronous circuits, computer arithmetic, memory systems and algorithmic state machine design; computer aided design (CAD) methodologies and tools. GE credit: SciEng | SE.—I. (I.II.) Akella, Al-Asaad, Amirtherajah, Bao, Ghiasi, Owens.
(change in existing course—eff. winter 13)

180B. Digital Systems II (5)
Lecture—3 hours; laboratory—6 hours. Prerequisite: course 180A. Continuing design of digital systems with emphasis on hardware description language (VHDL), logic synthesis, and field-programmable gate arrays (FPGA). May cover advanced topics. (I) System design such as static timing analysis, pipelining, memory system design, testing digital circuits. GE credit: SciEng | SE.—II. (III.)
(change in existing course—eff. fall 13)

181A. Digital Systems Design Project (2)
Workshop—1 hour; laboratory—4 hours. Prerequisite: courses 180B and either course 170 or Computer Science 122A. Digital-system and computer-engineering design course involving architecture, design, implementation and testing of a prototype application-specific processor under given design constraints. This is a team project that includes a final presentation and report. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—I. (I.) Ghiasi.
(change in existing course—eff. winter 13)

181B. Digital Systems Design Project (2)
Workshop—1 hour; laboratory—4 hours. Prerequisite: courses 180B and either course 170 or Computer Science 122A. Digital-system and computer-engineering design course involving architecture, design, implementation and testing of a prototype application-specific processor under given design constraints. This is a team project that includes a final presentation and report. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—II. (II.) Ghiasi.
(change in existing course—eff. winter 13)

183. Testing and Verification of Digital Systems (5)
Lecture—3 hours; laboratory—4 hours. Prerequisite: courses 170 and 180B. Computer aided-testing and design verification techniques for digital systems; physical fault testing; simulated design verification; formal verification; timing analysis. GE credit: SciEng | SE.—II. (II.) Al-Asaad.
(change in existing course—eff. winter 13)

189-A. Special Topics in Electrical Engineering and Computer Science 1-5
(change in existing course—eff. winter 13)

190C. Research Group Conferences in Electrical and Computer Engineering (1)
Discussion—1 hour. Prerequisite: upper division standing in Electrical and Computer Engineering; consent of instructor. Research group conferences. May be repeated for credit. (P/NP grading only.) GE credit: SciEng | SE.—I. (I.II.III.)
(change in existing course—eff. spring 13)

192C. Internship in Electrical and Computer Engineering 1-5
Internship—3–15 hours. Prerequisite: completion of a minimum of 84 units; project approval before period of internship; consent of supervisor. Supervised work experience in electrical and computer engineering. May be repeated for credit if project is different. (P/NP grading only.) GE credit: SciEng | SE.—I. (I.II.III.)
(change in existing course—eff. winter 13)

193A. Senior Design Project 3
Project—6 hours. Prerequisite: senior standing in Electrical or Computer Engineering; course 196 (may be taken concurrently); consent of instructor. Team design project for seniors in Electrical or Computer Engineering. Project involves analysis, design, implementation and evaluation of an Electrical Engineering or Computer Engineering system. Project supervised by a faculty member. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—I. (I.II.)
(change in existing course—eff. winter 13)

193B. Senior Design Project 2
Project—1 hour; laboratory—6 hours. Prerequisite: course 193A. Team design project for seniors in Electrical Engineering or Computer Engineering. Project involves analysis, design, implementation and evaluation of an Electrical Engineering or Computer Engineering system. Project supervised by a faculty member. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—I. (I.II.)
(change in existing course—eff. winter 13)

194A. Micromouse Design Project (2)
Discussion—1 hour; laboratory—3 hours. Prerequisite: course 70 or Computer Science Engineering 50; Engineering 17 (may be taken concurrently); course 100 or Engineering 100 recommended (may be taken concurrently); course 180A recommended (may be taken concurrently). Design of robotic mouse for the IEEE Micromouse competition. May be repeated up to one time for credit. (Deferred grading only, pending completion of sequence.) Offered irregularly. GE credit: SciEng | SE.
(change in existing course—eff. winter 13)

194B. Micromouse Design Project (2)
Discussion—1 hour; laboratory—3 hours. Prerequisite: course 70 or Computer Science Engineering 50; Engineering 17 (may be taken concurrently); course 100 or Engineering 100 recommended (may be taken concurrently); course 180A recommended (may be taken concurrently). Design of robotic mouse for the IEEE Micromouse competition. May be repeated up to one time for credit. (Deferred grading only, pending completion of sequence.) Offered irregularly. GE credit: SciEng | SE.
(change in existing course—eff. winter 13)

194C. Micromouse Design Project (1)
Discussion—1 hour. Prerequisite: course 70 or Computer Science Engineering 50; Engineering 17 (may be taken concurrently); course 100 or Engineering 100 recommended (may be taken concurrently); course 180A recommended (may be taken concurrently). Design of robotic mouse for the IEEE Micromouse competition. Limited enrollment. May be repeated one time for credit. (Deferred grading only, pending completion of sequence.) Offered irregularly. GE credit: SciEng | SE.
(change in existing course—eff. winter 13)

195A. NATCAR Design Project (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: courses 110A, 157A (can be taken concurrently); course 170 recommended (taken concurrently) if student intends to do the project with digital circuits. Pass one restricted to major. Design and construct an autonomous race car. Students work in groups to design, build and test speed control circuits, track sensing circuits, and a steering control loop. (Deferred grading only pending completion of sequence.) GE credit: SciEng | SE.—I. (I.) Spencer.
(change in existing course—eff. winter 13)
Engineering: Materials Science and Engineering

New and changed courses in Materials Science and Engineering (EMS)

Lower Division

2. Stuff: Diversity of Materials in Our Lives (3)
Lecture/discussion—2 hours. Role of materials in technological societies and their impact on our way of living. Exploration of how materials are extracted from the earth, processed, and shaped into products, including metals, durability, and reuse of materials. GE credit: SciEng | SE—I. (II) Risbud (change in existing course—eff. fall 12)

Upper Division

147. Principles of Polymer Materials Science (3)
Lecture—3 hours. Prerequisite: Chemistry 2A-2B; Geometry 6A; or Chemical Engineering 6A. Introduction to polymer science including structure and synthesis, polymerization mechanisms, polymer classes, properties, and reactions; polymer morphology, rheology, and characterization; polymer processing (same course as Polymer Science 100). GE credit: SciEng | QL, SE—I—II. (II) Pan (change in existing course—eff. winter 13)

160. Thermodynamics of Materials Processes and Phase Stability (4)
Lecture—4 hours. Prerequisite: C- or better in each of the following: Engineering 45, Mathematics 22, Chemistry 110A, Chemistry 22B, Chemistry 2C. Review of thermodynamic principles of interest to materials scientists and engineers. Application of thermodynamics to material processing, phase stability, corrosion. GE credit: SciEng | QL, SE, SL, VL—I. (II) Kim (change in existing course—eff. fall 13)

Lecture—4 hours. Prerequisite: C- or better in each of the following: Engineering 45, Mathematics 22, Physics 98B. Description of the structure of engineering materials on the atomic scale by exploiting the fundamentals of crystallography. The importance of this structure to materials' properties. Description of experimental methods for determining atomic structure. GE credit: SciEng | QL, SE—I—II. (II) Pan (change in existing course—eff. fall 13)

162L. Structure and Characterization of Materials Laboratory (2)
Laboratory—4 hours. Prerequisite: course 162. Open to students in Chemistry or Chemical Engineering. Open to students in Engineering who have completed course 138L. GE credit: SciEng, Writ | QL, SE, SL, VL—I. (II) Kim (change in existing course—eff. fall 13)

164. Rate Processes in Materials Science (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 45, and course 160. Basic kinetic laws and the principles governing phase transformations. Applications in diffusion, oxidation, nucleation, growth, and spinodal transformations. GE credit: SciEng | SE—I—II. (II) (change in existing course—eff. fall 13)

170. Sustainable Energy Technologies: Batteries, Fuel Cells, and Photovoltaic Cells (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 45. Open to students in Engineering or related fields. Basic principles of future energy devices such as lithium batteries, fuel cells, and photovoltaic cells. Examines the current status of these energy technologies and analyze challenges that still must be overcome. Offered in alternate years. GE credit: SciEng | SE—I—II. (II) Kim (new course—eff. fall 13)

172. Electronic, Optical and Magnetic Properties of Materials (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 110A or Physics 9D; Engineering 6 or Chemical and Materials Science 6 or equivalent (recommended). Electronic, optical, and magnetic properties of materials as related to structure and processing of solid state materials. Physical principles for understanding the properties of metals, semiconductors, ceramics, and amorphous solids and the applications of these materials in engineering. GE credit: SciEng | QL, SE, SL, VL—I. (II) Kim (change in existing course—eff. fall 13)

Graduate

217. Biomedical Electronics (4)
Lecture—3 hours; project. Prerequisite: course 210 or consent of instructor. Special consideration and accommodation will be made for biomedical or signal processing majors who have not taken 210. Circuit design for medical applications including weak inversion amplifiers; integrated IGFET filters; chopper stabilization; electrochemical interfaces; neurostimulation pulse generation; wireless powering of and communication with implantable devices. Electrophysiological signaling and aspects of signal processing for biomedical systems. —III. (III.) O'Driscoll (new course—eff. spring 13)

237B. Laser Physics II (4)

249. Nanofabrication (3)
Lecture—3 hours. Prerequisite: graduate standing in Engineering. Theory and practices of nanofabrication used for producing ICs, electronic devices, optoelectronics, sensors, and microstructures. Major topics include electron-, photon-, and ion-beams and their interactions with solids, chemical vapor deposition, plasma processing and micromachining. Offered in alternate years. —III. Hunt, Islam (change in existing course—eff. winter 13)

267. Mobile Communications (4)
Lecture/laboratory—3 hours. Prerequisite: courses 260 and 265 [can be taken concurrently]. Time-varying multi-path fading channel models and receiver performance in fading channels; multiple access techniques and multiple access receivers design and performance; optimum design and the capacity of wireless channels. Offered in alternate years. —II. Scaglione (change in existing course—eff. spring 13)

276. Telecommunications (4)
Lecture/laboratory—3 hours. Prerequisite: courses 260 and 265 [can be taken concurrently]. Time-varying multi-path fading channel models and receiver performance in fading channels; multiple access techniques and multiple access receivers design and performance; optimum design and the capacity of wireless channels. Offered in alternate years. —II. Scaglione (change in existing course—eff. spring 13)

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2013-2014 offering in parentheses.

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; Div—Diverse Diversity; Wrt—Writing Experience

Fall 2011 and on General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACHG—American Cultures; DD—Diverse Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WE—World Cultures; Wrt—Writing Experience
181. Materials Processing (4) Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: C- or better in Engineering 45; and Engineering 105 or Chemical Engineering 152B or Electrical & Computer Engineering 140A or course 164. Principles of phase equilibria, thermodynamics and reaction kinetics applied to materials processing. Effects of processing variables on the structure-property relationship. Fundamentals of the manufacturing processes for electronic, optical, functional and structural materials. GE credit: SciEng, Wrt I | OL, SE, VL, WE.—II. (II) (change in existing course—eff. fall 13)

182. Failure Analysis (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in Engineering 45; course 174 (recommended). Analysis of the way materials fail. Effects of temperature, mechanical deformation and corrosion on the properties of materials. Forensics and methodologies for investigating failures of materials including optical microscopy, x-ray analysis and scanning electron microscopy. Investigation of practical problems. GE credit: SciEng, Wrt I | OL, SE, VL, WE.—II. (II) (change in existing course—eff. fall 13)

188. Materials Design Project (4) Laboratory—4 hours; discussion—1 hour. Prerequisite: course 188A. Major materials design experiences involving analysis of real materials synthesis/processing/fabrication and technological applications including critical assessments of economic, manufacturing, and ethical constraints. Various principles of materials design are integrated into a culminating team design project. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | OL, SE, SL, VL, WE.—III. (III) Sen (change in existing course—eff. winter 13)

Engineering: Mechanical

New and changed courses in Engineering: Mechanical (ME)

Lower Division

50. Manufacturing Processes (4) Lecture/discussion—3 hours; laboratory—3 hours. Prerequisite: C- or better in: Engineering 4 and Physics 9A. Restricted to Mechanical Engineering and Mechanical Engineering/Materials Science Engineering majors. Modern manufacturing methods, safety, manufacturing instructions, computer-aided manufacturing and their role in the engineering design and development process. GE credit: SciEng | OL, SE, VL.—I, II, III. (I, II, III) Farouki, Schaaf, Yamazaki (change in existing course—eff. fall 13)

97TC. Mentoring and Tutoring Engineering in the Community (1-4) Prerequisite: consent of instructor. Mentoring, coaching, tutoring and/or supervision of students in K-12 schools in Engineering-related topics. May be repeated for credit. (P/NP grading only)—I, II, III. (I, II, III) (new course—eff. fall 12)

Upper Division


107A. Experimental Methods (3) Lecture—2 hours; laboratory—1.5 hours. Prerequisite: C- or better in Mechanical Engineering 106. Restricted to Mechanical Engineering, Aerospace Science & Engineering and Mechanical/ Materials Science Engineering majors. Explores the principles of experimental physics and methods. GE credit: SciEng | OL, SL, VL.—I, II, III. (I, II, III) (change in existing course—eff. winter 13)

107B. Experimental Methods (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: C- or better in Engineering 100 and Engineering 102; Engineering 104 recommended. Restricted to Mechanical Engineering, Aerospace Science & Engineering and Mechanical Engineering/Materials Science Engineering majors. Explores the principles of experimental methods. Course content: Reliability of measurement devices; basic errors in measurement; error analysis; laboratory techniques for materials testing; data acquisition and analysis. GE credit: SciEng | OL, SE, VL.—II. (II) (change in existing course—eff. winter 13)

115. Introduction to Numerical Analysis and Methods (4) Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: C- or better in: Engineering 6 or course 5 or Computer Science Engineering 30 or Chemical and Materials Science Engineering 6. (Change in existing course—eff. fall 13) GE credit: SciEng | OL, SE, VL.—I, II, III. (I, II, III) Hull, Horlsey, La Settepanara (change in existing course—eff. fall 13)

150A. Statistical Methods in Design and Manufacturing (4) Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in course 150A. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science Engineering majors. Methods of statistical analysis with emphasis on applications in mechanical design and manufacturing. Applications include product evaluation and decision making, statistical fingerprints, probabilistic design, systems reliability, and fatigue under random loading. GE credit: SciEng | OL, SE, VL.—II. (II) Hull (change in existing course—eff. fall 13)

152. Computer-Aided Mechanism Design (4) Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 102; C- or better in course 5 or Engineering 6 or Computer Science Engineering 30. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science Engineering majors. Principles of computer-aided mechanism design. Computer-aided kinematic, static, and dynamic analysis and design of planar mechanisms such as multiple-loop linkages and geared linkages. Introduction to kinematic synthesis of mechanisms. Offered in alternate years. GE credit: SciEng | OL, SE, VL.—II. (II) Cheng (change in existing course—eff. fall 13)

154. Mechatronics (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in each of the following: Engineering 100 and Engineering 102 and course 50. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science Engineering majors. Methodology and overview, control system design ware architecture, microcontroller and interface technology for
mechatronics control, sensor for mechatronics systems, actuator drives. GE credit: SciEng | QL, SE, VL. (I, II, III.) Yamazaki

(Change in existing course—eff. fall 13)

161. Combustion and the Environment (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Mechanical Engineering 106. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science and Engineering. Introduction to combustion kinetics; the theory of pre-mixed flames and diffusion flames; turbulent combustion; formation of air pollutants in combustion systems; examples of combustion devices which include internal combustion engines, gas turbines, furnaces and waste incinerators; alternative fuel sources. Offered in alternate years. GE credit: SciEng | QL, SE, VL.—I, II, III. (I, II, III.) Shaw

(Change in existing course—eff. winter 13)

163. Internal Combustion Engines and Future Alternatives (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in course 50 and course 106. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science and Engineering. Fundamentals of internal combustion engine design and performance. Future needs to adapt to environmental concerns, and the feasibility of better alternatives in the future. Offered in alternate years. GE credit: SciEng | QL, SE, VL.—I, II, III. (I, II, III.) Erickson

(Change in existing course—eff. fall 13)

165. Heat Transfer (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in course 5 or Engineering 6 or Computer Science Engineering 30; C- or better in Engineering 103 and 105. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science and Engineering. Conduction, convection, and radiation heat transfer. Computational modeling of heat transfer in engineering. Applications to engineering equipment with the use of digital computers. GE credit: SciEng | QL, SE, VL.—I, II, III. (I, II, III.) Davis, Kennedy, Shaw

(Change in existing course—eff. fall 13)

171. Analysis, Simulation and Design of Mechatronic Systems (4)

(Change in existing course—eff. fall 13)

172. Automatic Control of Engineering Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 100 and 102. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science and Engineering. Classical feedback control, block diagrams; control systems performance specifications; steady state errors; rise and settling times; root locus; PID controllers; control design with Bode and Nyquist plots; stability; phase and gain margin; lead and lag compensators; state variable feedback controllers. GE credit: SciEng | QL, SE, VL.—I, II, III. (I, II, III.) Eke, Joshi

(Change in existing course—eff. fall 13)

185A. Mechanical Engineering Systems Design Project (4)
Lecture—1 hour; laboratory—3 hours. Prerequisite: C- or better in: course 150A and course 165 (may be taken concurrently); Communications 1 or 3 recommended; upper division composition recommended. Restriction: Senior standing in Mechanical Engineering (EMEC). Major mechanical engineering design experience; the mechanical engineering design process and its use in the design of engineering systems incorporating appropriate engineering standards and multiple realistic constraints. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | QL, SE, VL, WE.—I, II, III. (I, II, III.) Velinsky, C. Davis

(Change in existing course—eff. fall 13)

185B. Mechanical Engineering Systems Design Project (4)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 15A and senior standing in the Department of Mechanical and Aerospace Engineering. Major mechanical engineering design experience; the mechanical engineering design process and its use in the design of engineering systems incorporating appropriate engineering standards and multiple realistic constraints. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | QL, SE, VL, WE.—I, II, III. (I, II, III.) Velinsky, C. Davis

(Change in existing course—eff. winter 14)

197TC. Mentoring and Tutoring Engineering in the Community (1-4)
Prerequisite: upper division standing; consent of instructor. Mentoring, coaching, tutoring and/or supervision of students in K-12 schools in Engineering-related topics. May be repeated for credit. (P/NP grading only)—I, II, III. (I, II, III.) New course—fall 12

1977. English
New and changed courses in English (ENL)

Lower Division

5F. Introduction to Creative Writing: Fiction (4)
Lecture/discussion—4 hours. Prerequisite: completion of Entry Level Writing requirement. Elements of principles of writing fiction. Write both in prescribed forms and in experimental forms of their own choosing. No final examination. May be repeated one time for credit. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (I, II, III.) (New course—fall 12)

5P. Introduction to Creative Writing: Poetry (4)
Lecture/discussion—4 hours. Prerequisite: completion of Entry Level Writing requirement. Elementary principles of writing poetry. Write both in prescribed forms and in experimental forms of their own choosing. No final examination. May be repeated one time for credit. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (I, II, III.) (Change in existing course—eff. winter 14)

10A. Literatures in English I: To 1700 (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or equivalent. Historical introduction to English language and literature from 800-1700. Linguistic borrowing, innovation, and change. Emergence of key literary genres. Continental and America as a new site of English literary production and consumption. GE credit: ArtHum | AH.—I, II, III. (I, II, III.)

(Change in existing course—eff. winter 13)

10B. Literatures in English II: 1700-1900 (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 10A. Historical introduction to English language and literature from 1700-1900. Linguistic borrowing, innovation, colonization, and change. Emergence and development of key literary genres. America, Britain, Ireland, Scotland, and India as important sites of English literary production and consumption. GE credit: ArtHum | AH.—I, II, III. (I, II, III.)

(Change in existing course—eff. winter 13)

10C. Literatures in English III: 1900 to Present (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 10B. Historical introduction to English language and literature from 1900–present. Linguistic borrowing, innovation, and change. Emergence and development of key literary genres. America, Britain, Ireland, Scotland, and India as important sites of English literary production and consumption. GE credit: ArtHum | AH.—I, II, III. (I, II, III.)

(Change in existing course—eff. winter 13)

40. Introductory Topics in Literature (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 2 or University Writing Program 1 or equivalent. Study of a special topic. Literature written in English in any period or place or genre. Thematic, formal, or temporal focus. May be repeated two times for credit when content differs. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (I, II, III.)

(Change in existing course—eff. winter 13)

42. Approaches to Reading (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or its equivalent. Close reading and interpretation of literature from a variety of traditional and contemporary approaches. Topics include textual and historical approaches; new criticism; formalism; psychological criticism; feminism and gender; reader-response; materialist approaches. Frequent written assignments. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (I, II, III.)

(Change in existing course—eff. winter 13)

43. Introductory Topics in Drama (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or its equivalent. Close reading of, and topics relating to, selected works of British and American drama from a range of historical periods. May be repeated two times for credit when content differs. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (I, II, III.)

(Change in existing course—eff. fall 13)

44. Introductory Topics in Fiction (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or its equivalent. Close reading of, and topics relating to, British and American Fiction: short stories, novels, novellas. Frequent written exercises. May be repeated two times for credit when content differs. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (I, II, III.)

(Change in existing course—eff. fall 13)

45. Introductory Topics in Poetry (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or its equivalent. Topical study and close reading of selections from English and American poetry. May be repeated two times for credit when content differs. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (I, II, III.)

(Change in existing course—eff. fall 13)

46A. Masterpieces of English Literature (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Selected works of principal writers to 1640. History of literary conventions and back-
grounds in religious thought, intellectual and social history, and related art forms. GE credit: ArtHum, Wrt | AH, WC, WE.

46B. Masterpieces of English Literature (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Selected works of principal writers from 1-640 to 1832. History of literary conventions and backgrounds in religious thought, intellectual and social history, and related art forms. GE credit: ArtHum, Wrt | AH, WC, WE.

46C. Masterpieces of English Literature (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Selected works of principal writers from 1832 to present. The history of literary conventions and backgrounds in religious thought, intellectual and social history, and related art forms. GE credit: ArtHum, Wrt | AH, WC, WE.

Upper Division

100FA. Creative Writing Advanced Fiction (4) Discussion—4 hours. Prerequisite: course 100P. Priority given to English majors. Admission by application only. Development and evaluation of students' work in prose, primarily in the workshop format. Some reading and discussion of published novels and short stories. Conferences with individual students once per quarter. May be repeated one time for credit with consent of instructor. —II. (III.)

100P. Creative Writing: Poetry (4) Discussion—4 hours. Prerequisite: course 5F or 5P, or consent of instructor; priority given to English majors. Writing of poetry. May be repeated for credit with consent of instructor. No final examination. —II, III.

100PA. Creative Writing Advanced Poetry (4) Discussion—4 hours. Prerequisite: course 100P. Priority given to English majors. Admission by application only. Development and evaluation of students' work in poetry, primarily in the workshop format. Some reading and discussion of published works of poetry. Conferences with individual students once per quarter. May be repeated one time for credit with consent of instructor. —II. (III.)

107. Freedom of Expression (4) Lecture—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historical development of fundamental issues and contemporary controversies about freedom of expression, with emphasis on literary and artistic censorship. GE credit: ArtHum, Wrt | AH, WE.

110A. Introduction to Literary Theory (4) Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Key theoretical terms, concepts, and thinkers from the Greeks to the modern era. GE credit: ArtHum, Wrt | AH, WE.—I.

110B. Introduction to Modern Literary and Critical Theory (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. History of literary criticism in the modern era, with emphasis on the ties with the past and the special problems presented by modern literary theory. GE credit: ArtHum, Wrt | AH, WC.—II, III.

111. Topics in Medieval Literature (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused intensive examination of selected topics in Medieval English literature. GE credit: ArtHum, Wrt | AH, WC, WE.—I, II.

115. Topics in Sixteenth and Seventeenth Century Literature (4) Lecture/discussion—3 hours, extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study of works of the Renaissance. Offered irregularly. GE credit: ArtHum, Wrt | AH, WC, WE.

123. 18th-Century British Literature (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of 18th century English literature. GE credit: ArtHum, Wrt | AH, WC, WE.

125. Topics in Irish Literature (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Intensive study or treatment of special topics related to the Irish literary tradition and its emergence, invention, and re-invention of Irish literature. May be repeated two times for credit when content differs. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WC, WE.

130. British Romantic Literature (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of works of Romantic English literature. GE credit: ArtHum, Wrt | AH, WC, WE.

133. 19th-Century British Literature (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused intensive examination of selected topics in 19th century British literature. GE credit: ArtHum, Wrt | AH, WC, WE.

140. Topics in Postcolonial Literatures and Cultures (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Study of postcolonial literature of Anglophone colonies. Specific emphases may include literature from and about Anglophone India, the Caribbean, the Middle East, South Asia, Africa, and/or South America. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WE.

141. Topics in Diasporic Literatures and Migration (4) Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Study of literatures, histories, and cultures of one or more diasporic groups. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WE.

142. Early American Literature (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of American literature. GE credit: ArtHum, Wrt | ACGH, AH, WE.

143. 19th-Century American Literature to the Civil War (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of works of 19th-century American literature. GE credit: ArtHum, Wrt | ACGH, AH, AH, WE.

144. Post-Civil War American Literature (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of works of post-Civil War American literature. GE credit: ArtHum, Wrt | ACGH, AH, WE.

146. American Literature 1900-1945 (4) Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of American literature (drama, poetry, prose fiction) from the period between 1900 and the end of World War II. GE credit: ArtHum, Wrt | ACGH, AH, WE.

146N. American Literature 1900-1945 (4) (canceled course—eff. winter 14)

147. American Literature, 1945 to the Present (4) Lecture—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of American literature (drama, poetry, prose fiction) from the period between 1945 and the present. GE credit: ArtHum, Wrt | ACGH, AH, WE.

149. Topics in Literature (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Intensive examination of literature considered in topical terms, not necessarily historically. May be repeated for credit when content differs. GE credit: ArtHum, Wrt | AH, WE.—I.

150A. British Drama to 1800 (4) Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically...
or thematically focused study of works of English drama up to 1800. GE credit: ArtHum, Wrt | AH, WC, WE.

(Change in existing course—eff. fall 13)

150B. Drama from 1800 to the Present (4)
Lecture/discussion—3 hours; extensive writing or discussion. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of works of British drama from 1800 to the present. GE credit: ArtHum, Wrt | AH, WC, WE.

(Change in existing course—eff. fall 13)

153. Topics in Drama (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study of drama. May be repeated for credit with topic differs. GE credit: ArtHum, Wrt | AH, WE.—I.

(Change in existing course—eff. winter 13)

155A. 18th-Century British Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically organized examination of the 18th-century British novel, with particular emphasis on its evolution, including the epistolary novel, the picaresque novel, and the Gothic novel: Richardson, Fielding, Sterne, Austen. GE credit: ArtHum, Wrt | AH, WC, WE.—I.

(Change in existing course—eff. winter 13)

155B. 19th-Century British Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically organized examination of 19th-century British novelists, with emphasis on the historical novel, the social novel, and novels by women: Scott, Dickens, the Brontës, Eliot, Hardy. GE credit: ArtHum, Wrt | AH, WC, WE.—II.

(Change in existing course—eff. winter 13)

155C. 20th-Century British Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically organized examination of the 20th-century British novel, with emphasis on impressionism; the revolt against naturalism; the experimental novel; the anti-modernist reaction; post-war writers: Woolf, Lawrence, Drabble, Rhys. GE credit: ArtHum, Wrt | AH, WC, WE.

(Change in existing course—eff. winter 13)

158A. The American Novel to 1900 (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically organized examination of American novel from its beginnings; Hawthorne, Melville, Twain, James, and others. GE credit: ArtHum, Wrt | ACGH, AH, WE.—II.

(Change in existing course—eff. winter 13)

158B. The American Novel from 1900 to the Present (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically organized examination of American novels of the twentieth century; Faulkner, Hemingway, Fitzgerald, Morrison, and others. GE credit: ArtHum, Wrt | ACGH, AH, WE.—III.

(Change in existing course—eff. winter 13)

159. Topics in the Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Examination of major novels arranged thematically. Topics might include Bildungsroman, stream-of-consciousness novel, Gothic novel, historical novel. May be repeated for credit with topic differs. GE credit: ArtHum, Wrt | AH, WE.—III.

(Change in existing course—eff. winter 13)

164. Writing Science (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or Science and Technology Studies 1, or equivalent. Texts and writing practices in the production of scientific knowledge. Surveys the literary structures of scientific arguments; history of scientific genres; rhetoric and semantics in scientific culture; graphical systems in the experimental laboratory; narratives of science, including science fiction. (Same course as Science & Technology Studies 164.) GE credit: ArtHum, Wrt | AH, SL, WE.—III.

Milburn

(Change in existing course—eff. winter 13)

165. Topics in Poetry (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 and course 45. Intensive examination of various topics expressed in poetry from all periods of American and American literature. May be repeated for credit when topic covers different poets and poems. GE credit: ArtHum, Wrt | AH, WE.—I.

(Change in existing course—eff. winter 13)

166. Love and Desire in Contemporary American Poetry (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Close reading of contemporary American poems on the theme of love and desire by poets of diverse ethnicities and of gay, lesbian, and heterosexual orientations. Offered in alternate years. GE credit: Div, ArtHum, Wrt | ACGH, AH, WE.—III.

(Change in existing course—eff. winter 13)

167. Twentieth-Century African American Poetry (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Twentieth-Century African American poetry, including oral and literary traditions. Authors covered may include Gwendolyn Brooks, Countee Cullen, Robert Hayden, and Langston Hughes. GE credit: ArtHum, Div | Wrt | ACGH, AH, WE.

(Change in existing course—eff. winter 13)

168. 20th Century American Poetry (4)
Lecture—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historical Study of American poetry since 1900, with thematic and formal focus at the instructor's discretion. Offered irregularly. GE credit: ArtHum, Wrt | ACGH, AH, WE.

(Change in existing course—eff. fall 13)

177. Study of an Individual Author (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 110A or 110B. In-depth study of an author's works; historical context; relation to predecessors and contemporaries; critical reception; influence. May be repeated one time if author differs. GE credit: Wrt | AH, WE.—II, III.

(Change in existing course—eff. winter 13)

178. Topics in Nations, Regions, and Other Cultural Geographies (4)
Lecture—3 hours; term paper or writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or equivalent. Literary productions of a local, regional, national, transnational, or other geographical formations; e.g., the global South; literature of Hawaii; literature of Australia. May be repeated two times for credit. GE credit: ArtHum, Div | Wrt | AH, WE.

(Change in existing course—eff. winter 13)

181A. African American Literature to 1900 (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. African American literature from the colonial period to 1900. Particular attention to the rapid development of the African American literary culture from a primarily oral tradition to various literary genres, including the slave narrative. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, WE.—I.

(Change in existing course—eff. winter 13)

181B. African American Literature 1900- Present (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Major African American writers in the context of cultural history from 1900 to the present. Writers may include Richard Wright, Ann Petry, James Baldwin, Ralph Ellison, Paule Marshall, Toni Morrison, Alice Walker, Clarence Major. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, WE.—II.

(Change in existing course—eff. winter 13)

183. Adolescent Literature (4)
Lecture—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Intensive study and teaching of American adolescent literature. GE credit: ArtHum, Wrt | AH, WE.—II.

(Change in existing course—eff. winter 13)

185A. Women's Writing I (4)
Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Women's Writing in English before 1800; organized by period, place, genre, or theme. GE credit: ArtHum, Div, Wrt | AH, WE.

(Change in existing course—eff. winter 13)

185B. Women's Writing II (4)
Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Women's Writing in English from 1800 to 1900; organized by period, place, genre, or theme. GE credit: ArtHum, Div | Wrt | AH, WE.—II.

(Change in existing course—eff. winter 13)

186. Literature, Sexuality, and Gender (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Intensive study and teaching of gender and sexuality in British and American literature. GE credit: ArtHum, Div, Wrt | AH, WE.

(Change in existing course—eff. winter 14)

189. Seminar in Literary Studies (4)
Seminar—3 hours; term paper. Prerequisite: course 110A or 110B. Intensive, focused study of literature at an advanced level. May be organized by topic, author, period, movement, or genre. High participation. GE credit: ArtHum, Wrt | AH, WE.

(Change in existing course—eff. fall 13)

194H. Seminar for Honors Students (4)
Seminar—3 hours; term paper. Prerequisite: course 110A or 110B; one advanced study course; admission to English Department Senior Honors Program or University Writing Program 1, or equivalent. Intensive study of a broad topic, examined in depth as a seminar for honors students. GE credit: ArtHum, Wrt | AH.

(Change in existing course—eff. winter 13)

195H. Honors Thesis (4)
Independent study—12 hours. Prerequisite: course 194H. Preparation of a thesis, under the supervision of an instructor. Students satisfying requirements for the general major or the teaching emphasis write on the
a scholarly or critical subject; creative writing students submit a volume of poems or fiction. GE credit: ArtHum | AH, WE.

(change in existing course—eff. winter 13)

Entomology

New and changed courses in Entomology (ENT)

Lower Division

1. Art, Science and the World of Insects (3)
   Lecture—5 hours; laboratory—3 hours. Fusion of entomology and art to create an appreciation of insect biology, ecology, interactions with humans and importance in human culture. Multidisciplinary approaches in education and career paths in entomology and art. GE credit: ArtHum or SciEng or SocSci | AH or SE or SS, OL, VL, WE. —I. (I.) Ullman

(change in existing course—eff. winter 13)

Upper Division

105. Insect Ecology (4)
   Lecture/discussion—3 hours; term paper. Prerequisite: Biological Sciences 2B or equivalent. Biology, ecology and taxonomy of freshwater macroinvertebrates, including insects, crustaceans, molluscs, worms, leeches, flatworms and others. Adaptation to life in freshwater. Aquatic food webs. Uses of macroinvertebrates in water quality monitoring. Field trips during regular lab hours. Limited enrollment. GE credit: SciEng | OL, SE, SL, WE. —I. (I.) Yang

(change in existing course—eff. fall 13)

116. Freshwater Macroinvertebrates (3)
   Lecture—2 hours; laboratory—3 hours. Prerequisite: Biological Sciences 2B or equivalent. Biology, ecology and taxonomy of freshwater macroinvertebrates, including insects, crustaceans, molluscs, worms, leeches, flatworms and others. Adaptation to life in freshwater. Aquatic food webs. Uses of macroinvertebrates in water quality monitoring. Field trips during regular lab hours. Limited enrollment. GE credit: SciEng | OL, SE, SL, WE. —I. (I.) Yang

(change in existing course—eff. winter 13)

156L. Biology of Parasitism Laboratory (1)
   Laboratory—3 hours. Prerequisite: course 156 (concurrently) or consent of instructor. Laboratory demonstrations using selected examples of protozoan and metazoan parasites and along with various techniques used in parasitology to exemplify concepts presented in the lecture course. GE credit: SciEng, WRT | SE.—II. (II.) Lawler

(change in existing course—eff. winter 13)

180A. Experimental Ecology and Evolution in the Field (4)
   Lecture/labatory—3 hours; fieldwork—3 hours. Prerequisite: course 105, or Environmental Science and Policy 100; Evolution and Ecology 100; Evolution and Ecology 101. Experimental design in field ecology. Examination of primary literature, experimental design, independent and collaborative research, analysis of data, development of original research paper based on field experiments. (Same course as Evolution and Ecology 180A.) Offered in alternate years. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | QL, SE, VL, WE. —III. (III.) Yang

(new course—eff. winter 14)

180B. Experimental Ecology and Evolution in the Field (4)
   Lecture/labatory—3 hours; fieldwork—3 hours. Prerequisite: Evolution and Ecology and Entomology 180A; Evolution and Ecology 100; Evolution and Ecology 101, or Environmental Science and Policy 100; course 105. Experimental design in field ecology. Examination of primary literature, experimental design, independent and collaborative research, analysis of data, development of original research paper based on field experiments. (Same course as Evolution and Ecology 180B.) Offered in alternate years. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | QL, SE, VL, WE. —III. (III.) Yang

(new course—eff. winter 14)

Environmental Horticulture

New and changed courses in Environmental Horticulture (ENH)

Lower Division

6. Introduction to Environmental Plants (4)
   Lecture—1 hour; discussion—2 hours; laboratory—3 hours. Classification, nomenclature and terminology of environmental plants. GE credit: SciEng | SE, VL. —I. (I.) Young

(change in existing course—eff. winter 13)

Upper Division

100. Urban Forestry (4)
   Lecture—2 hours; laboratory—3 hours; term paper. Prerequisite: Biological Sciences 1C or Plant Sciences 2. Principles and practices of planning and managing urban vegetation. Basics of tree appraisal, natural resource inventory, and development of long term urban forest management plans. GE credit: SciEng | SE. —I. (I.) Harding

(change in existing course—eff. winter 13)

101. Trees of the Urban Forest (2)
   Lecture—1 hour; laboratory—2 hours. Prerequisite: course 6 or consent of instructor. Identification and evaluation of 200 tree species of the urban forest on campus, in the Arboretum, and in the city of Davis; appraised and aesthetic values, condition, and branch structure; contribution of trees to this ecosystem. GE credit: SciEng | VL, SE. —I. (I.) Harding

(change in existing course—eff. winter 13)

102. Physiological Principles in Environmental Horticulture (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1C. Physiological principles and processes essential to floriculture, nursery crop production, turf curtalce and landscape horticulture. Emphasis on the control of vegetative and reproductive development for all kinds of species in greenhouses and extensive landscape environments. GE credit: SciEng | SE. —I. (I.) Burger

(change in existing course—eff. winter 13)

105. Taxonomy and Ecology of Environmental Plant Families (4)
   Lecture—2 hours; laboratory—6 hours. Prerequisite: course 6 or consent of instructor. Classification and identification of plant families and genera used in urban forests, with emphasis on floral and vegetative characteristics of the prominent families of angiosperms and gymnosperms, adaptations to environmental variations in western landscapes, and ornamental selection. GE credit: SciEng | VL, SE, WRT. —III. (III.) Harding

(change in existing course—eff. winter 13)

120. Management of Container Media (3)
   Lecture—2 hours; laboratory—3 hours. Prerequisite: Soil Science 10. Principles of soil science and practices related to management of container media are taught, emphasizing appropriate use of soils and amendments, irrigation, and fertilizers. Physical and chemical properties are tested and effects of management on crops are evaluated in the laboratory. GE credit: SciEng | QL, SE, WE. —I. (I.) Evans

(change in existing course—eff. winter 13)

125. Greenhouse and Nursery Crop Production (5)
   Lecture—3 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: Plant Sciences 2 or Biological Sciences 1C. Principles and techniques for the production of ornamental greenhouse and nursery crops. Hands-on experience producing greenhouse crops. Optional weekend field trip. GE credit: SciEng | SE, WE. —II. (II.) Libert

(change in existing course—eff. winter 13)

129. Analysis of Horticultural Problems (4)
   Lecture—1 hour; laboratory—6 hours. Prerequisite: course 102, Entomology 110, Plant Pathology 120, and Soil Science 100 or the equivalents. Methods of analysis common to all environments in the landscape, greenhouse, and nursery. Diagnosis of plant disorders caused by soil, water, insects, disease, chemical agents, climatic conditions or cultural practices. Approaches to diagnosis and acquisition and integration of information. GE credit: SciEng | SE. —III. (III.) Durzan

(change in existing course—eff. winter 13)

130. Turfgrass and Amenity Grassland Utilization and Management (4)
   Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: Biological Sciences 1C or Plant Sciences 2. Utilization and management of amenity and landscape grassland systems. Emphasis on biology of grass species, ecology and culture practice of sports turf and landscape grassland systems, social and environmental benefits, environmental impacts, and integrated management systems. GE credit: SciEng | SE. —II. (II.) Burger

(change in existing course—eff. winter 13)

133. Woody Plants in the Landscape: Growth, Ecology and Management (4)
   Lecture—3 hours; laboratory—2 hours; discussion—1 hour. Prerequisite: Biological Sciences 1C or the equivalent preparation in plant biology. Principles and practices of managing trees and shrubs in the urban landscape and other managed environments. Topics include: woody plant growth and development; adaptation of tree management in relation to soil, moisture, climate; plant problems. GE credit: SciEng | SE. —II. (II.) Berry

(change in existing course—eff. winter 13)

150. Genetics and Plant Conservation: The Biodiversity Crisis (5)
   Lecture/discussion—3 hours. Prerequisite: Biological Sciences 1C or the equivalent. Conservation of genetic diversity, measurement of diversity, threats to diversity and reasons for protection, the process of extinction, distribution of diversity, determination of what to conserve and means of conservation. Examples drawn largely from forest tree species. GE credit: SciEng | SE, SL. —I. (I.) Nadeau

(change in existing course—eff. winter 13)

160. Restoration Ecology (3)
   Lecture—3 hours. Prerequisite: Plant Biology/Evolution and Ecology 117 or Evolution and Ecology 121 or Plant Biology 147 or the equivalent. Conceptual bases of restoration ecology; tools used by restoration ecologists to solve practical problems; scope and success of actual restoration projects. GE credit: SciEng | SE, WE. —III. (III.) Evner

(change in existing course—eff. winter 13)

160L. Restoration Ecology Laboratory (1)
   Laboratory/discussion—3 hours. Prerequisite: course 160 (may be taken concurrently). Companion field course to course 160. A series of part-day and all day visits to various field sites, involving site
Environmental Science and Management

New and changed courses in Environmental Science and Management (ESM)

**Lower Division**

6. **Map Reading and Remote Sensing (3)**
   Lecture/discussion—3 hours. Restricted to 30 students. Basic skills in map reading, map grid systems, projections, aerial photography, photogrammetry, remote sensing sensors and platforms; the role of cartography and remote sensing in environmental analysis. Not open to students who have successfully completed Environmental Resources Sciences 47. (Formerly Environmental Resources Sciences 6.) GE credit: ScEng | SE—I. (III.) Evener
   (change in existing course—eff. winter 13)

47. **Watershed Processes and Water Quality in the Tahoe Basin (2)**
   Lecture/laboratory—21 hours; fieldwork—9 hours; discussion—3 hours; term paper. Prerequisite: basic knowledge of environmental, soil, or hydrologic sciences. Watershed processes, runoff water-quality management, restoration in Lake Tahoe Basin. Soils, precipitation-runoff, revegetation and adaptive management related to water control, effective solutions, development of restoration strategies. Students develop field restoration. Course involves 3 days of instruction in Tahoe City. (Same course as Hydrologic Science 47.) Not open to students who have successfully completed Environmental and Resource Sciences 47. (Formerly Environmental and Resource Sciences 47.) GE credit: ScEng | VL, SE, SL.—IV. (IV.) Bahre
   (change in existing course—eff. winter 13)

**Upper Division**

108. **Environmental Monitoring (3)**
   Lecture/discussion—2 hours; laboratory—2 hours; fieldwork. Prerequisite: entry level course work in student's major; specifically, Evolution and Ecology 101 (Evolution and Ecology), Environmental Science and Policy 100 (Environmental Biology and Management), Environmental Toxicology 101 (Environmental Toxicology), Wildlife, Fish, and Conservation Biology 100 (Wildlife, Fish, and Conservation Biology), and Environmental and Resource Sciences 141 (Hydrologic Science). Soil Science 100 (Soil Science, Environmental Horticulture 100 (Environmental Horticulture and Urban Forestry), Landscape Architecture 100 (Landscape Architecture) or the equivalent for any of these courses. Instrumentation and methods for environmental and ecological monitoring; GPS, sensors, datalogging, and GIS. Wide range of measurement methods for environmental parameters. Not open to students who have successfully completed Environmental and Resource Sciences 108. (Formerly Environmental and Resource Sciences 108.) GE credit: ScEng | VL, SE, SL—II. (III.) Hopmans
   (change in existing course—eff. winter 13)

140. **Culinary and Medicinal Herbs (2)**
   Lecture/discussion—3 hours. Prerequisite: Plant Sciences 2, Biological Sciences 1C, or Biological Sciences 2C. Growth, identification, cultivation and use of common culinary and medicinal herbs; herbal plant families; effects of climate and soils on herbs; herbal medicine, ecology and geography of herbs, herbs growing in the wild, and the chemistry of active compounds. (Same course as Plant Sciences 140.) Not open for credit to students who have successfully completed Environmental and Resource Science 140 or Plant Biology 140. (Formerly Environmental and Resource Science or Plant Biology 140.) GE credit: ScEng | SE, SL—III. (III.) Saltveit
   (change in existing course—eff. winter 13)

141. **Role of Fire in Natural Ecosystems (4)**
   Lecture—3 hours; term paper. Prerequisite: basic biological concepts: Biological Sciences 2A or Plant Sciences 2; ecology/evolution; Biological Sciences 2B or 2C. Fire regimes and roles in major North American vegetation types, especially in the west. Physics of fire, fire effects on organisms and ecosystem functioning, reconstructing fire histories, fire resource management, and fire use by indigenous people. Not open to students who have successfully completed Environmental and Resource Sciences 141. (Formerly Environmental and Resource Sciences 141.) GE credit: ScEng | SE, SL, WE.—II. (II.) Latimer
   (change in existing course—eff. winter 13)

144. **Trees and Forests (4)**
   Lecture—3 hours; discussion—1 hour. Prerequisite: Plant Sciences 2 or Biological Sciences 1C or 2C. Biological structure of trees as organisms, understanding of forests as communities and as ecosystems; use of forests by humans; tree phenology, photosynthesis, respiration, soil processes, life histories, dormancy, forest biodiversity, and agroforestry. (Same course as Plant Sciences 144.) Not open for credit to students who have completed Plant Biology 144 or Environmental Horticulture 144 or Environmental and Resource Science 144. (Former course Plant Biology/Environmental Horticulture/ Environmental and Resource Science 144.) GE credit: ScEng | VL, VL—II. (I.) Berry, Dahlgren, Rice
   (change in existing course—eff. winter 13)

186. **Environmental Remote Sensing (5)**
   Lecture—3 hours; laboratory—6 hours. Prerequisite: Mathematics 16B and Physics 7C or 9B; upper division standing; Landscape Architecture 150 recommended. Overview of satellite, airborne, and ground-based remote sensing, building on principles of electromagnetic radiation. Applications include hydrologic processes, weather and climate, ecology and land use, soils, geography, forestry, and agriculture. Computer based analysis and visualization of image processing techniques. Not open to students who have successfully completed Hydrologic Science 186 or Environmental and Resource Sciences 186. (Formerly Hydrologic Science 186 and formerly Environmental and Resource Sciences 186.) GE credit: ScEng | VL, SE, VL—II. (II.) Ustin
   (change in existing course—eff. winter 14)

186L. **Environmental Remote Sensing Lab (2)**
   (cancelled course—eff. spring 14)

194H. **Senior Honor Thesis (2-6)**
   Independent study—2.6 hours. Prerequisite: senior standing, overall GPA of 3.50 or higher and consent of master adviser. Independent study, guided research on a topic of special interest to the student. GE credit: ScEng | SE, WE.
   (change in existing course—eff. winter 13)

195. **Integrating Environmental Science and Management (2)**
   Lecture/discussion—2 hours. Prerequisite: senior status in Environmental Science and Management major or other environmental science major (e.g. Environmental Resource Science, Environmental Biology and Management, Environmental Toxicology, Environmental Management, Wildlife, Fish, and Conservation Biology, Hydrologic Science,) consent of instructor. Practical aspects of environmental improvement through integrated analysis of contemporary issues of problems associated with advocacy, regulation, science and resource management from the perspectives of the physical and ecological sciences and current policy/management. May be repeated for total credit. GE credit: ScEng or SocSci | SS or SE.—II. (II.)
   (change in existing course—eff. winter 13)

Environmental Science and Policy

New and changed courses in Environmental Science and Policy (ESP)

**Lower Division**

1. **Environmental Analysis (4)**
   Lecture—3 hours; discussion—1 hour. Prerequisite: University Writing Program 1 or English 3 or equivalent; sophomore standing; Economics 1A and Biological Sciences 2B recommended. Analysis of the physical, biological, and social interactions which constitute environmental systems. Emphasis on analysis of environmental problems, the consequences of proposed solutions, and the interaction of environmental science and public policy in creating solutions. GE credit: ScEng or SocSci | VL, SS or SL, VL—I. (I.) Basket, Sanchirico
   (change in existing course—eff. winter 13)

10. **Current Issues in the Environment (3)**
   Lecture—3 hours. Prerequisite: elementary biology recommended. The science behind environmental issues, and policies affecting our ability to solve domestic and international environmental problems. Resources, environmental quality, regulation, environmental perception and conservation. Integrative case studies. Not open for credit to students who have completed course 101. GE credit: ScEng | SS or SL, WE.—II. (II.) Holoyak
   (change in existing course—eff. winter 13)

100. **General Ecology (4)**
   Lecture—3 hours; discussion—1 hour. Prerequisites: Biological Sciences 1A, 1B, 1C, Mathematics 16A, 16B; Statistics 13 recommended. Theoretical and experimental analysis of the distribution, growth and regulation of species populations; predator-prey and competitive interactions; and the organization of natural communities. Application of evolutionary and ecological principles to selected environmental problems. GE credit: ScEng | SE or SS, VL—II. (II.) Cornell, Sih
   (change in existing course—eff. winter 13)

105. **Evolution of Societies and Cultures (4)**
   Lecture—3 hours; discussion—1 hour. Prerequisite: Anthropology 1 or course 30 or Evolution and Ecology 100 or Biological Sciences 101. Interdisciplinary study of social and cultural evolution in humans. Culture as a system; evolution of cultural learning, culture as an adaptive system, evolution of maladaptations, evolution of technology and institutions, evolutionary transitions in human history, coevolution of genetic and cultural variation. Only 2 units of credit to students who have completed course 101 or Anthropology 101 prior to fall 2004. (Same course as Anthropology 105.) GE credit: SocSci, WR—VL, SS, WC, WE—III. (III.)
   (change in existing course—eff. fall 11)

110. **Principles of Environmental Science (4)**
   Lecture—3 hours; discussion—1 hour. Prerequisite: Physics 1A or 7A, Mathematics 16B or 21B, and Biological Sciences 1A. Application of physical and...
150A. Physical and Chemical Oceanography (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Environmental Science and Policy/Geology 116, Physics 9B, Mathematics 22C, Chemistry 1C, or upper division standing in a natural science and consent of instructor. Physical and chemical properties of seawater, fluid dynamics, air-sea interaction, currents, waves, tides, mixing, major oceanic geochemical cycles. (Same course as Geology 150A.) GE credit: ScEng | QL, SE—II—(III.) McClain, Spero, Largier
(change in existing course—eff. winter 13)

150B. Geological Oceanography (3) Lecture—3 hours. Prerequisite: Geology 50 or 116. Introduction to the origin and geologic evolution of ocean basins. Composition and structure of ocean crust; marine geology and tectonics; basaltic lavas, and continental margins. Geologic evolution of oceanic and continental crusts. GE credit: ScEng | SE—II—(III.)
(change in existing course—eff. winter 13)

150C. Biological Oceanography (4) Lecture—3 hours; discussion—1 hour; laboratory—two weekend field trip required. Prerequisite: Biological Sciences 1A and a course in general ecology or consent of instructor. Ecology of major marine habitats: open ocean, algal turf, coral reefs, intertidal areas, continental shelves, and deep-sea communities. GE credit: ScEng | SE—II—(III.)
(change in existing course—eff. winter 13)

151. Limnology (4) Lecture—3 hours; discussion—1 hour; special proj. Prerequisite: Biological Sciences 1A and consent of instructor. The biology and productivity of inland waters with emphasis on the physical and chemical environment. GE credit: ScEng | SE.
(change in existing course—eff. winter 13)

151L Limnology Laboratory (3) Laboratory—6 hours; two weekend field trips. Prerequisite: course 151. (May be taken concurrently) junior, senior, or graduate standing. Limnological studies of lakes, streams, and reservoirs with interpretation of aquatic ecology. GE credit: ScEng | SE.
(change in existing course—eff. winter 13)

152. Coastal Oceanography (3) Lecture—2 hours; discussion—1 hour; laboratory—3 hours; fieldwork—3 hours. Prerequisite: upper division standing or consent of instructor. Ecology of marine populations and communities living in diverse habitats along the California coast. Hands-on learning using scientific process and tools of the biological trade to address ecological questions arising during field trips. Critical thinking through discussion of scientific literature. GE credit: ScEng | SE, SL—II—(III.)

155. Wetland Ecology (3) Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or Plant Biology 117 required; course 110 or 151 recommended. Introduction to wetland ecology. The structure and function of major wetland types and principles that are common to wetlands and that distinguish them from terrestrial and aquatic ecosystems. GE credit: ScEng | SE—II—(III.) Rejmanova
(change in existing course—eff. winter 13)

155L. Wetland Ecology Laboratory (3) Lecture—2 hours; laboratory—6 hours; fieldwork—two 1-day weekend field trips. Prerequisite: course 155 required (may be taken concurrently). Modern and classic techniques in wetland field ecology. GE credit: ScEng | SE, SL—II—(III.) Rejmanova
(change in existing course—eff. winter 13)

160. The Policy Process (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Political Science 1; Economics 1A; intermediate statistics; course 172. Alternative models of public policymaking and application to case studies in the U.S. and California. GE credit: SocSci | SS—III—(III.)

162. Environmental Policy (4) Lecture—3 hours; discussion—2 hours; term paper. Prerequisite: Economics 1A. Compares economic with social-cultural approaches to understanding the causes of environmental problems and strategies for addressing them. Includes different approaches to the policy process, policy instruments, and environmental behavior. Applies these principles to several problem areas. GE credit: SocSci | SS—II—(III.) Springborn
(change in existing course—eff. winter 13)

163. Energy and Environmental Aspects of Transportation (4) Lecture—3 hours; extensive writing. Prerequisite: Economics 1A or Engineering 106. Engineering, economic, and systems planning concepts. Analysis and evaluation of energy, air quality, and selected environmental attributes of transportation technologies. Strategies for reducing pollution and petroleum consumption in light of institutional and political constraints. Evaluation of vehicle emission models. [Same course as Civil and Environmental Engineering 163.] Offered in alternate years. GE credit: SciEng or SocSci, Wrt | SE or SS, SL, WE—II. Sperling
(change in existing course—eff. winter 14)

164. Ethical Issues in Environmental Policy (3) Lecture—3 hours. Prerequisites: courses 160, 168A; seniors only in Environmental Policy Analysis and Planning or by consent of instructor. Basic modes of ethical reasoning and criteria of distributive justice applied to selected topics in environmental policy-making. GE credit: SocSci | SS—III—(III.)

165N. Climate Policy (3) Lecture/discussion—3 hours. Prerequisite: course 1, Economics 1A, or consent of instructor. Models, data and assumptions behind competing arguments regarding societal response to the prospect of climate change at the state, national and international level from economic, ethical and policy science perspectives. —III. (III.) Springborn (new course—eff. fall 13)

166N. Ocean and Coastal Policy (3) Lecture—3 hours. Prerequisite: course 1, Economics 1A, or consent of instructor. Limited enrollment. Overview of U.S. and International ocean and coastal policy, including ocean, coastal land-use and water quality, protected areas and species. GE credit: SocSci | SS—III—(III.) Sanchirico
(new course—eff. spring 13)

167. Energy Policy (4) Lecture—4 hours; term paper. Prerequisite: Economics 1A, Mathematics 168, or consent of instructor. Survey of primary energy resources [fossil, renew-
able, nuclear), energy conversion methods, future energy demand scenarios, and environmental impacts of energy. Overview of energy policy in the U.S. Analysis of policy alternatives for addressing energy-related environmental and national security issues. Offered in alternate years. GE credit: SocSci | SS.—(III.) Ogden.

**Environmental Toxicology**

**New and changed courses in Environmental Toxicology (ETX)**

**Lower Division**

92. Internship (1-12)
Intership—3.6 hours. Prerequisite: lower division standing and consent of instructor. Work experience off and on campus in all subject areas offered in the College of Agricultural and Environmental Sciences. Internships supervised by a member of the faculty. (P/NP grading only.) GE credit: SE.

(change in existing course—eff. winter 13)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.

(change in existing course—eff. winter 13)

**Upper Division**

101. Principles of Environmental Toxicology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 8B, 118B, or 128B and Biological Sciences 1A. Principles of toxicology with a focus on environmental, industrial, and natural chemicals. Topics include fate and effects of chemicals in organisms and the environment, air pollutants, insecticides, aquatic toxicology, endocrine disruptors, biomarkers and bioassays, and risk assessment. GE credit: SciEng | SE, SL, VL, WE.—II. (I.) Denison

(change in existing course—eff. winter 13)

102A. Environmental Fate of Toxicants (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 8B, 118B, or 128B and consent of instructor. Properties of toxic chemicals influencing their distribution and transformations; action of environmental forces affecting toxicant breakdown, movement, and accumulation; sources and occurrence of major classes of environmental toxicants. Not open for credit to students who have completed course 112A. GE credit: SciEng | QL, SE, SL, VL, WE.—II. (II.) Tjeerdema

(change in existing course—eff. winter 13)

102B. Quantitative Analysis of Environmental Toxicants (5)
Lecture—3 hours; laboratory—2 hours; discussion—1 hour. Prerequisite: course 102A. Sample preparation methods for trace analysis of environmental toxicants. Concept and techniques of advanced analytical instrumentation. Interpretation and use of analytical data. Not open for credit to students who have completed course 112B. GE credit: SciEng | QL, SE, VL, WE.—II. (II.) Tjeerdema

(change in existing course—eff. winter 13)

103A. Biological Effects of Toxicants (4)
Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 102; course 101 and Neurobiology, Physiology, and Behavior 101. Estimated, cellular and tissue targets, mechanisms of action, and pathological effects. Not open for credit to students who have completed course 114A. GE credit: SciEng | QL, SE.—II. (II.) Rice

(change in existing course—eff. winter 13)

103B. Biological Effects of Toxicants: Experimental Approaches (5)
Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 103A. Experimental approaches for assessing the toxicity and effects of toxicants. Not open for credit to students who have completed course 114B. GE credit: SciEng | QL, SE, VL, WE.—II. (II.) Miller

(change in existing course—eff. winter 13)
104. Environmental and Nutritional Factors in Cellular Regulation and Nutritional Toxicants (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 101; Biological Sciences 103 or Animal Biology 103. Cellular regulation from nutritional/toxicological perspective. Emphasis on role of biofuels on modulation of signal transduction pathways, role of specific organelles in organization/ regulation of metabolic transformations, major cofactor functions, principles of pharmacology/toxicology important to understanding nutrient/toxicant metabolism. (Same course as Nutrition 104.) GE credit: SciEng | SE, VL, SL, WE.—II. (II.) Alexeiff (change in existing course—eff. winter 13)

110. Toxic Tragedies and Their Impact on Society (2)
Lecture—2 hours. Prerequisite: Biological Sciences 10 or the equivalent or consent of instructor; Chemistry 118A. Recommended. Examination of toxic tragedies, their origins, consequences, and effects on toxic regulation. GE credit: SciEng, Wrt | OL, SE, SL, WE.—II. (II.) Rice (change in existing course—eff. winter 13)

111. Introduction to Mass Spectrometry (3)
Lecture—3 hours. Prerequisite: Chemistry 118C. Introduction to mass spectrometry, including ionization techniques, mass analyzers, interpretation of mass spectra, and applications of mass spectrometry. Emphasis on fundamental concepts of mass spectrometry necessary to identify and quantify organic molecules. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

120. Perspectives in Aquatic Toxicology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry BB, 118B or 128B, Biological Sciences 1A, or consent of instructor. Toxic substances, their fate in marine and freshwater systems, and their effects on aquatic organisms, populations, and ecosystems. Emphasis on substances and issues of current concern. Offered in alternate years. GE credit: SciEng | OL, SE, VL, WE.—II. Chert, Tjeerdema (change in existing course—eff. winter 13)

130. The Role and Applications of Toxicology in Modern Industry (3)
Lecture—3 hours. Prerequisite: course 101 required; course 103A recommended. Role of toxicology in industry research, outbreak investigation, human health and environmental protection, hazard and risk evaluation, risk management and communications, product stewardship, and regulatory compliance. Scientific principles of classical methods of toxicology in chemical, energy, pharmaceutical, pesticide, biotechnology industries. GE credit: SciEng | OL, SE, VL, WE.—II. (III.) Wong (change in existing course—eff. winter 13)

131. Environmental Toxicology of Air Pollutants (3)
Lecture—3 hours. Prerequisite: Chemistry BB [may be taken concurrently] or the equivalent; Biological Sciences 102 recommended. Field trip required. Toxicology of air pollutants in the ambient, indoor, and occupational environments. Health effects, sources, environmental factors, pulmonary responses, sampling and analyses, and air-quality criteria and standards. GE credit: SciEng | SE, VL.—I. (I.) Kado (change in existing course—eff. winter 13)

138. Legal Aspects of Environmental Toxicology (3)
Lecture—3 hours. Prerequisite: course 10 or 101 recommended. Federal and California legislation concerning air and water pollution, pesticide use, food and feed additives, consumer protection, and occupational exposure to toxic substances; roles of federal regulatory agencies; alternatives to government control. GE credit: SciEng | SE, VL, WE.—II. (II.) Alexeiff (change in existing course—eff. winter 13)

190. Seminar (1)
Seminar—1 hour. Prerequisite: consent of instructor. Selected topics presented by students, faculty, or outside speakers covering current research and instructional activities within environmental toxicology. Reports and discussion concerning oral and written presentations, literature sources, and career opportunities. (P/NP grading only.) GE credit: SciEng | SE.—I, III, II, II, III. (change in existing course—eff. winter 13)

190C. Research Group Conference (1)
Discussion—1 hour. Prerequisite: consent of instructor. Weekly conference of advanced research methods and the interpretation of research results. (P/NP grading only.) GE credit: SE.—I, II, III. (I, II, III.) (change in existing course—eff. winter 13)

1905. Environmental Toxicology Career Seminar (1)
Seminar—1 hour. Careers in environmental toxicology: discussions with alumni from the Department of Environmental Toxicology and other experts in the field. (P/NP grading only.) GE credit: SE.—I. (change in existing course—eff. winter 13)

192. Internship (1-12)
Internship—3.36 hours. Prerequisite: completion of 84 units and consent of instructor. Work experience off and on campus in all subject areas offered in the College of Agricultural and Environmental Sciences. Internships supervised by a member of the faculty. (P/NP grading only.) GE credit: SE. (change in existing course—eff. winter 13)

194HA-194HB. Honors Research (3-3)
Discussion—1 hour; laboratory—6 hours. Prerequisite: senior standing, minimum GPA of 3.250, consent of instructor. Specific research project conducted under the supervision of a faculty sponsor. Experience to include experimental design, learning new techniques, data analysis and interpretation of findings. (P/NP grading only; deferred grading pending completion of sequence.) GE credit: SE. (change in existing course—eff. winter 13)

194HC. Honors Research (3)
Laboratory—6 hours; discussion—1 hour. Prerequisite: senior standing, minimum GPA of 3.250, and consent of instructor. Continuation of research project conducted under the supervision of a faculty sponsor. GE credit: SE. (change in existing course—eff. winter 13)

197T. Tutoring in Environmental Toxicology (1)
Tutoring in Environmental toxicology including conducting discussions, answering questions, and being tutored. Prerequisite: advanced standing in Toxicology of Air Pollutants, Environmental Toxicology, a related major, or the equivalent experience and consent of instructor. Continuation of course 194HA-194HB. GE credit: SE. (change in existing course—eff. winter 13)

201. Evolution for Non-Biologists (3)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C; Biological Sciences 101; Mathematics 16A, 16B, 16C or the equivalent; Statistics 13 or 100 (Statistics 100 recommended). A general survey of the origins of biological diversity and evolutionary mechanisms. GE credit: SciEng | QL, SE, VL, WE.—II, III, III, II, II, III. Begun, Coop (change in existing course—eff. winter 13)

202. Population and Quantitative Genetics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C; Mathematics 16A, 16B, 16C or the equivalent. Application of these ideas to topics such as the evolution of sex. GE credit: SciEng | QL, SE, VL, WE.—II, III, III, II, II, III. Gaylord, Sanford, Schoener, Schreiber, Shapiro, Strong Williams (change in existing course—eff. winter 13)

203. Phylogeny, Speciation and Macroevolution (4)
Lecture—3 hours; laboratory/discussion—3 hours. Prerequisite: course 100. Statistical inference of evolutionary patterns and processes above the species level. Topics include estimation of phylogenies and divergence times, character evolution, biogeography, and macroevolutionary patterns. GE credit: SciEng | QL. (change in existing course—eff. winter 13)
graphic history, and rates and patterns of lineage diversification, with an emphasis on the origin of species in terrestrial and aquatic environments. GE credit: SciEng | QL, SE, SL—(II.) Moore, Torelli

104. Community Ecology (4)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 101 or Environmental Science and Policy 100. Population growth and density dependence; predation; exploitative, interference and apparent competition; coexistence mechanisms; niches, spatial and temporal variation; stability, diversity, and productivity of food webs; applications to conservation and biological control. Emphasis on quantitative understanding through models, concepts, and empirical evidence. GE credit: SciEng | SE, SL, VL.

105. Phylogenetic Analysis of Vertebrate Structure (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1A and 1B, or 28B and 2C. The structure of the classes and subclasses of vertebrates is described and interpreted in terms of phylogeny. GE credit: SciEng | SE—II. Wainwright

106. Mechanical Design in Organisms (3)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours; fieldwork—3 hours. Prerequisite: upper division standing or consent of instructor; introductory animal biology (Biological Sciences 1B or 2B), invertebrate zoology (course 112), and/or ecology (course 101) are recommended; residence at or near Bodega Marine Lab required. Student must complete the application available at http://www.bml.ucdavis.edu. Explores fundamental principles of design in living organisms, examining how basic properties of size, shape, structure, and habitat constrain ways in which plants and animals interact and cope with their physical surroundings. Offered in alternate years. GE credit: SciEng | QL, SE, VI, WE—IV. (IV.) Gaylord

107. Animal Communication (3)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 2B. How animals use songs, dances, colors, chemicals, electricity and vibrations to communicate. Mechanisms of signal production and detection (in simple systems), theory of informa
tion transfer and signal design, and the role of natu
ralselection in shaping communication. Offered in alternate years. GE credit: SciEng | QL, SE, VL—(II.) Patricelli

110. Running, Swimming and Flying (3)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours; fieldwork—3 hours. Prerequisite: upper division standing or consent of instructor; introductory animal biology (Biological Sciences 1A or 28B, invertebrate zoology (course 112), and/or ecology (course 101) are recommended; residence at or near Bodega Marine Lab required. Student must complete the application available at http://www.bml.ucdavis.edu. Examines the bases of organism movement in terrestrial, aquatic, and aerial environments, emphasizing both the unifying principles underlying locomotion, as well as a range of strategies employed across diverse groups of organisms. GE credit: SciEng | QL, SE, VI, WE.

111. Marine Environmental Issues (1)
Discussion—1 hour; seminar—2 hours. Prerequisite: upper division standing or consent of instructor. Concurrent enrollment in at least one course from Environmental Policy 124, 152, 106, 110, 114; residence at or near Bodega Marine Laboratory required. Student must complete the application available at http://www.bml.ucdavis.edu. An examination of critical environmental issues occurring in coastal waters. Course links together material from concurrent courses at BML, UC Davis, and POM, in a comparative understanding of marine environments and their conservation. Includes readings, group discussions, and interaction with visiting speakers. May be repeated as credit for credit. GE credit: POM, as Environmental Science and Policy 111. GE credit: SciEng | SE, SL—IV. (IV.) Gaylord, Sanford

114. Experimental Invertebrate Biology (3)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours; fieldwork—3 hours. Prerequisite: upper division standing or consent of instructor; introductory animal biology, cell and animal biology (Biological Sciences 1A, 1B and 1C), invertebrate zoology (Evolution and Ecology 112), ecology (Evolution and Ecology 101) or equivalent for treatment of Evolution and Ecology 100 are recommended; residence at or near Bodega Marine Lab required. Student must complete the application available at http://www.bml.ucdavis.edu. The biology, ecology, and evolution of local marine invertebrates with a focus on adaptations to environmental and biological factors encountered on the California coast. Hands-on field and laboratory techniques with emphasis on generating and testing hypotheses. GE credit: SciEng | QL, SE, VI, WE—IV. (IV.) Sanford

115. Marine Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 101 or Environmental Science and Policy 100 or Biological Sciences 28B, or consent of instruc
tor. Processes affecting the distribution, abundance, and diversity of plant and animal life in the sea. Introduction to marine habitat diversity and human impacts on marine ecosystems. GE credit: Evolution and Ecology 100 recommended; residence at or near Bodega Marine Lab required. GE credit: SciEng | QL, SE, SL, WE—II. (II.) Stachowicz

119. Population Biology of Invasive Plants and Weeds (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C; introductory standing recommended. Origin and evolution of invasive plant species and weeds, repro
duction and dispersal, seed ecology, modeling of population dynamics, interactions between invasive species, native species, and crops, biological control. Laboratories emphasize design of competition experiments and identification of weedy species. (Same course as Plant Biology 119.) GE credit: SciEng | SE—II. (II.) Ramirez

120. Global Change Ecology (3)
Lecture/discussion—3 hours. Prerequisite: course 100 and 101 and 104 and 189 or equivalent. Treatment of historical evolution of the biosphere resulting from physical, chemical, and biological influences. Special focus upon changes caused by humans. Topics pertain to biodiversity, resources, conservation, and ecosystem services. —II. (II.) Strong

147. Biogeography (4)
Lecture—3 hours; term paper. Prerequisite: Biological Sciences 1A and 1B, or 2B. Movements of terres
trial organisms. The role of geologic, climatic, and biological influences. Special focus upon changes caused by humans. Topics pertain to biodiversity, resources, conservation, and ecosystem services. —II. (II.) Strong

149. Evolution of Ecological Systems (4)
Lecture—3 hours; term paper. Prerequisite: course 101 or Environmental Studies 100 (or the equiva
lent), and 114 and 115 and 119. Evolution as an organizing force in natural communities. Coadaptation in trophic and competitive relationships.

Ecology of polymorphisms, clines, and speciation. Offered in alternate years. GE credit: SciEng | SE, SL, WE—II. Shapiro

161. Microbial Phylogenomics–Genomic Perspectives on the Diversity and Diversification of Microbes (3)
Lecture—3 hours. Prerequisite: Biological Sciences 2A, 2B, and 2C or equivalent. Use of DNA and genomic sequencing in studies of the diversity of microorganisms. Diversity of microbes, phylogeneti
cs, genome sequencing, comparative genomics, phylogenomics, lateral gene transfer, molecular ecol
ogy, metagenomics, and studies of the human micro
biome. Offered in alternate years. GE credit: SciEng | SE—III. Eisen

180A. Experimental Ecology and Evolution in the Field (4)
Lecture/labatory—3 hours; fieldwork—3 hours. Prerequisite: course 100; course 101, or Environment
al Science and Policy 100; Entomology 105. Experimental design in field ecology. Examination of primary literature, experimental design, independent and collaborative research, analysis of data, develop
ment of original research paper based on field expe
rimental results. (Same course as Entomology 180A.) Offered in alternate years. (Deferred grading only, pending completion of research paper.) GE credit: SciEng | QL, SE, VL—(II.) Yang, Louie

180B. Experimental Ecology and Evolution in the Field (4)
Lecture/labatory—3 hours; fieldwork—3 hours. Prerequisite: Evolution and Ecology or Entomology 180A; course 100; course 101, or Environmental Science and Policy 100; Entomology 105. Experimen
tal design in field ecology. Examination of primary literature, experimental design, independent and collaborative research, analysis of data, develop
ment of original research paper based on field exper
imental results. (Same course as Entomology 180B.) Offered in alternate years. (Deferred grading only, pending completion of research paper.) GE credit: SciEng | QL, SE, VL—(III.) Yang

181. Ecology and Evolution of Animal-Plant Interactions (4)
Lecture—1.5 hours; lecture/discussion—1.5 hours; term paper; extensive writing or discussion. Prerequisi
tes: Biological Sciences 2B and 2C required; Bio
lological Sciences 2C may be taken concurrently.
Animal adaptations for eating plants, pollinating flowers, dispersing seeds. Plant adaptations to herbi
vore defense, attraction of mutualists, role of coevo
lutionary arms race, mutualists and cheaters in plant/animal specialization. Exploration through lec
tures, original scientific literature, discussions and term paper. Offered in alternate years. GE credit: SciEng | QL, QL, SE, SL, WE—II. Strauss

189. Introduction to Biological Research (1)
Discussion—1 hour. Prerequisite: upper division standing in Evolution and Ecology or related biologi
cal science; consent of instructor. Introduction to research methods in biology. Presentation and dis
cussion of research by faculty, graduate, and under
graduate students. May be repeated for credit up to a total of 6 units. (P/NP grading only.) GE credit: SE—II, III, III; FI, II, III

190. Undergraduate Seminar (2)
Seminar—2 hours. Prerequisite: upper division standing in the biological sciences or equivalent; 1 credit. Students report on current topics with empha
sis on integration of concepts, synthesis, and state-of-the-art research approaches. Reviews of literature 2012-2014 General Catalog Course Supplement and Policies and Requirements Addendum

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2013-2014 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Domestic Diversity; Wrt—Writing Experience
Fall 2011 and on General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
Exercise Biology

New and changed courses in Exercise Biology (EXB)

Lower Division

90X. Lower Division Seminar (1-2)
Lecture—1-2 hours. Prerequisite: lower division standing and consent of instructor. Gives freshman or sophomore level students the opportunity to study a special topic in the general area of Exercise Biology in a small class setting. GE credit: SciEng | SE.

change in existing course—eff. winter 13

Upper Division

101. Exercise Physiology (4)
Lecture—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior. 101. Physiologic responses to acute exercise, and physiologic adaptations to both chronic exercise (training) and selected environmental stresses. Emphasis on the muscular, metabolic, cardiovascular, respiratory, and renal responses and adaptations to exercise. Only 1 unit of credit allowed to students who have completed Exercise Science 101. Only 3 units of credit allowed to students who have completed Exercise Science 102. Not open for credit to students who have completed Exercise Science 101 and 102 (Former Exercise Science 110 and 111). GE credit: SciEng | SE, SL—I. [I] Bodine, Shaffrath.

change in existing course—eff. winter 13

103. Analysis and Control of Human Movement (4)
Lecture—4 hours. Prerequisite: Cell Biology and Human Anatomy 101 and 102, Physics 7A and 7B. Neurobiology, Physiology, and Behavior 101 recommended. Fundamentals of neuromotor control, and the biomechanics of human movement. Human movement understood in the context of body structures, basic principles of physiological and functional characteristics of nerve and muscle. Only 1 unit of credit allowed to students who have completed Exercise Science 103. Only 3 units of credit allowed to students who have completed Exercise Science 104. Not open for credit to students who have completed Exercise Science 101 and 104. (Former Exercise Science 103 and 104.) GE credit: SciEng | QL, SE—III. [III] Williams.

change in existing course—eff. winter 13

104L. Exercise Biology Laboratory (3)
Laboratory—3 hours; lecture—1 hour; discussion—1 hour. Prerequisite: course 101, 102, 103 (the last course may be taken concurrently). Principles and analytical procedures for assessing fundamental physiological, biomechanical, motor learning and motor control factors which underlie human movement and performance. Only 1 unit of credit allowed to students who have completed Exercise Science 101L. Only 1 unit of credit allowed to students who have completed Exercise Science 103. Not open for credit to students who have completed Exercise Science 101L and 103. GE credit: SciEng | Wrt | SE, WE—III, [I], [II], [III] Shaffrath.

change in existing course—eff. winter 13

110. Exercise Metabolism (3)
Lecture—3 hours. Prerequisite: course 101 or Neurobiology, Physiology and Behavior 101. Exercise metabolism, with emphasis on skeletal muscle and cardiac muscle metabolism during activity and inactivity. Basics of bioenergetics, substrate utilization, and cell signaling, mechanisms that regulate these processes, and differences between skeletal muscle and cardiac muscle metabolism. GE credit: SciEng | QL, SE—II. [II] Shaffrath.

(change in existing course—eff. winter 13)

111. Environmental Effects on Physical Performance (3)
Lecture—2 hours; discussion/laboratory—3 hours. Prerequisite: course 101 or consent of instructor. The effects of thermal, barometric and gravitational conditions on physiological function and physical performance of humans. Acute and chronic effects, emphasizing physiological adaptations and limitations, will be studied. GE credit: SciEng | QL, SE—II. [II] Shaffrath.

(change in existing course—eff. winter 13)

112. Clinical Exercise Physiology (4)
Lecture—3 hours; laboratory/discussion—3 hours. Prerequisite: courses 101 or consent of instructor. Physical activity as a therapeutic modality in normal and diseased populations (cardiovascular, pulmonary, diabetic). Effects of exercise and inactivity in terms of normal physiology, pathophysiology, and therapeutic benefit. Exercise fitness and disease assessment methods. GE credit: SciEng | SE, SL—II. [II] Harris, Shaffrath.

change in existing course—eff. winter 13

116. Nutrition for Physically Active Persons (3)
Lecture—3 hours. Prerequisite: course 101, Neurobiology, Physiology, and Behavior 101. The role of nutrition and exercise in modifying metabolism, body composition, performance and health of humans. GE credit: SciEng | SE.

(change in existing course—eff. winter 13)

120. Sport in American Society (3)
Lecture—3 hours. Sociological approaches to the study of sport and contemporary American culture, including sport and society interaction with politics, economics, religion, gender, race, media and ethics. Socialization factors involving youth, scholastic, collegiate, and Olympic sport. (Same course as Physical Education 120.) GE credit: SciEng, SocSci | Div, S—SS—III, [I], [II], [III] (new course—eff. fall 11)

124. Physiology of Maximal Human Performance (3)
Lecture—3 hours; practice—4 hours. Prerequisite: course 101 or permission of instructor; Biological Sciences 101, 102, and 103 recommended. Molecular mechanisms underlying adaptation to training.

change in existing course—eff. winter 13
Fiber and Polymer Science

New and changed courses in Fiber and Polymer Science (FPS)

Upper Division

100. Principles of Polymer Materials Science (3)
Lecture—3 hours. Prerequisite: Chemistry 2A-2B; Chemistry 8A-8B or Engineering 45; introductory physics. The basic principles of polymer science are presented including polymer structure and synthesis; polymerization mechanisms, polymer classes, properties, and reactions; polymer morphology, rheology, and characterization; polymer processing. (Same course as Materials Science Engineering 147.) GE credit: ScEng | QL, SL, VL, WE.—II. (II.) Pan (change in existing course—eff. winter 13)

150. Polymer Syntheses and Reactions (3)
Lecture—3 hours. Prerequisite: Chemistry 1288 or 88, and Chemistry 107A. Organic and physical chemistry aspects of polymer syntheses and reactions including polymerization mechanisms, kinetics and thermodynamics for major types of organic high polymers. GE credit: ScEng | QL, QL, SE, SL, VL, WE.—II. (II.) Hsieh (change in existing course—eff. winter 13)

161L. Textile Chemical Analysis Laboratory (1)
Laboratory—3 hours. Prerequisite: course 161L may be taken concurrently. Laboratory methods and procedures employed in qualitative and quantitative analysis of textile fibers and auxiliaries. ScEng | GE credit: QL, QL, SE, SL, VL, WE.—II. (II.) Hsieh (change in existing course—eff. winter 13)

180A-180B. Introduction to Research in Fiber and Polymer Science (2)
Laboratory/discussion—6 hours. Prerequisite: senior standing in major related to Fiber and Polymer Science, and consent of instructor. Senior thesis an independent problem. Research begun in course 180A will be continued and completed in course 180B. (Deferred grading only, pending completion of sequence.) GE credit: ScEng | QL, QL, SE, VL, WE.—II. (II.) Hsieh (change in existing course—eff. winter 13)

Film Studies

New and changed courses in Film Studies (FMS)

Upper Division

129. Russian Film (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: Russian 100 or consent of instructor. History of Russian film; film and social revolution, the cult of Stalin, disaffected visions; film and the collapse of the Soviet empire; gender and the nation in Russian film. Course taught in English; films are in Russian with English subtitles. Offered in alternate years. (Same course as Russian 129.) GE credit: ArtHum, Div, Wrt | AH, OL, VL, WE.—I. (I.) Clover, Contestabile, Fisher, Heyer-Capet, Lu, Simon. (change in existing course—eff. fall 13)

189. Special Topics in Film Studies (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 189L, or consent of instructor. Group study of a special topic in film, focusing on a national tradition, a major filmmaker, or a specific era. May be repeated three times for credit. GE credit: ArtHum, Wrt | AH, OL, VL, WE.—I, II, III. (I, III.) Cleaver, Contestabile, Fisher, Heyer-Capet, Lu, Simon. (change in existing course—eff. winter 13)

195H. Honors Thesis (1-5)
Independent study—3-15 hours. Prerequisite: course 194H and consent of instructor; GPA of at least 3.500; senior standing. Writing of an honors thesis on a topic in Film Studies under the direction of a faculty member. May be repeated two times for credit. (P/NP grading only.) GE credit: AH, VL, WE.—I, II, III. (I, II, III.) (change in existing course—eff. winter 13)

196H. Honors Project (1-5)
Project—3-15 hours. Prerequisite: course 194H and consent of instructor; GPA of at least 3.500; senior standing. Creation of an honors film, video, or mixed-media project under the direction of a faculty member. May be repeated two times for credit. (P/NP grading only.) GE credit: AH, VL, WE.—I, II, III. (I, II, III.) (change in existing course—eff. winter 13)

Food Science and Technology

New and changed courses in Food Science and Technology (FST)

Lower Division

1. Principles of Food Science (3)
Lecture—2 hours; discussion—1 hour. Food science fundamentals. Fresh and processed food technologies; world food problems; food composition; food microbiological and toxicological safety; food laws; evaluation of acceptability and nutritional value. Not open for credit to students who have taken course 102A. GE credit: ScEng | SE.—I. (I.) McCarthy (change in existing course—eff. winter 13)

47. Food Product Development Field Study (1)
Discussion—6 hours; fieldwork—2 days (course given between winter and spring quarters). Prerequisite: advance enrollment required in winter quarter with instructor, background knowledge in foods from such courses as Food Science and Technology 1. Commercial aspects of the large-scale development, distribution, and evaluation of food products intended for human consumption. (Former course Consumer Science 47P.) (P/NP grading only.) GE credit: SE. (change in existing course—eff. winter 13)

50. Introduction to Food Preservation (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Chemistry 2A, Biological Sciences 2A, Statistics 13. Restricted to Food Science Majors. Introduction to modes of fresh food preservation including use of chemicals and microbes, heat and energy, control of water and atmosphere, and by indirect approaches such as packaging, hygiene design and sanitation. GE credit: ScEng | QL, QL, SE.—I. (I.) McCarthy (change in existing course—eff. winter 13)

Upper Division

100A. Food Chemistry (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 8B or Biological Sciences 3A or Biochemistry 1A recommended. Chemical aspects of food composition. Emphasis on the functional properties and chemical reactions of the major components of foods: carbohydrates, lipids, proteins, and water. GE credit: ScEng | QL, SE.—I. (I.) Duncan (change in existing course—eff. winter 13)

100B. Food Properties (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A or consent of instructor. Sensory quality, chemical and microbial safety, and nutritional properties of foods. Effects of food processing and preparation on these properties. Selected properties of food commodities. GE credit: ScEng | QL, SE, VL.—II. (II.) German (change in existing course—eff. winter 13)

101A. Food Chemistry Laboratory (2)
Lecture/laboratory—4 hours. Prerequisite: course 100A (may be taken concurrently). Chemical aspects of food composition described in course 100B. GE credit: QL, SE, VL, WE.—I. (I.) Slupsky (change in existing course—eff. winter 13)

101B. Food Properties Laboratory (2)
Lecture/laboratory—1 hour and hours. Prerequisite: course 100B (may be taken concurrently). Study of properties of food described in course 100B. GE credit: ScEng | QL, SE, VL, WE.—II. (II.) Shoemaker (change in existing course—eff. winter 13)

102A. Malting and Brewing Science (4)
Lecture—4 hours. Prerequisite: Biological Sciences 102, 103; senior standing recommended. The technology of the malting, brewing and fermentation processes is integrated with the chemistry, biochemistry and microbiology that determine industrial practices and product quality. Not open for credit to students who have taken course 102B. GE credit: ScEng | SE.—II. (II.) Bamforth (change in existing course—eff. winter 13)

102B. Practical Malting and Brewing (4)
Lecture/discussion—2 hours; laboratory—6 hours. Prerequisite: course 102A and analytical experience beyond Chemistry 2C, such as Viticulture and Enology 123, Food Science and Technology 103, 123L, Molecular and Cellular Biology 120L. Open to seniors only in Fermentation Science or Food Science and Technology. Provides practical working knowledge of analytical methods used in malting and brewing and experience with brewing materials and processes, by analysis of samples that illustrate the range of values experienced in practice and pilot scale brewing. GE credit: ScEng | QL, SE.—III. (III.) Bamforth (change in existing course—eff. winter 13)

103. Physical and Chemical Methods for Food Analysis (4)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: Chemistry 2C, 8B, Biological Sciences or Animal Biology 102 (may be taken concurrently), courses 100A, 101A (may be taken concurrently). Theory and application of physical and chemical methods for determining the constituents of foods. Modern separation and instrumental analysis techniques are stressed. GE credit: ScEng | QL, SE, WE.—II. (II.) Mitchell (change in existing course—eff. winter 13)

104. Food Microbiology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 102. Microorganisms in food safety, spoilage, and production. Food-borne disease agents and their control. Growth patterns, bacterial population changes and management agents. Destruction of microbes in food. Food fermentations. The development of microbes as a resource for the food industry. GE credit: ScEng | QL, SE, VL.—II. (II.) Marcotulli (change in existing course—eff. winter 13)

104L. Food Microbiology Laboratory (4)
Lecture—1 hour; discussion—1 hour; laboratory—6 hours. Prerequisite: Biological Sciences 1A, course 104. Cultural and morphological characteristics of microorganisms involved in food spoilage, in food-
107. Food Sensory Science (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Agricultural Management and Rangeland Resources 120 or course 117 (may be taken concurrently). Critical examination of techniques and theories of sensory measurement of food; measures of consumer perception and acceptance. An introduction to the sensory and cognitive systems associated with the perception of food. Not open for credit to students who have completed course 107A. GE credit: SciEng | QL, SE. —III. (III.) Young (change in existing course—eff. winter 13)

108. Food Processing Plant Sanitation (2)
Lecture—2 hours. Prerequisite: Chemistry 8B, Biological Sciences 1A, course 104 (may be taken concurrently) or consent of instructor. Sanitary control of food processing equipment, practice of water treatment, chemical and physical sanitizing agents; principles of cleaning and hard surface detergency, metal corrosion, pest control, and waste disposal; role of regulatory agencies. GE credit: SciEng | QL, SE, WE.—I. (I.) O'Mahony (change in existing course—eff. winter 13)

109. Principles of Quality Assurance in Food Processing (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: Statistics 13 or Agricultural Management and Rangeland Resources 120. Quality assurance measurement techniques to selected food processed products emphasized. Rationale for establishing valid quality assurance programs including selection of samples at critical points. Statistical problems in quality assurance programs used by the food industry. GE credit: SciEng | QL, SE, SL, VL.—III. (III.) (change in existing course—eff. winter 13)

110. Food Processing (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Physics 7A, 7B, 7C or the equivalent; Mathematics 16A, 16B, 16C or the equivalent; course 50 (may be taken concurrently). Not open for credit to students enrolled in College of Engineering. Application of the conservation of mass and energy to food processing. Elements of engineering thermodynamics, fluid mass transfer, and heat transfer. GE credit: SciEng | QL, SE, SL, VL.—I. (I.) Ristenpart (new course—eff. fall 13)

110L. Food Processing Laboratory (2)
Laboratory—3 hours; discussion—1 hour. Prerequisite:course 110 (may be taken concurrently). Open to Food Science majors only. Laboratory exercises to gain experience with common food processing operations at the bench and pilot scale plants. GE credit: SciEng | QL, SE, SL, VL.—II. (II.) Ristenpart (new course—eff. fall 13)

110A. Physical Principles in Food Processing (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Physics 5A and 5B or 7A/7B/7C or the equivalent; calculus recommended. Not open for credit to students enrolled in College of Engineering. Applications of the conservation of mass and energy to food processing. Elements of engineering thermodynamics, fluid mechanics, and heat transfer. GE credit: SciEng | QL, SE, SL, VL.—I. (I.) McCarthy (change in existing course—eff. winter 13)

110B. Heat and Mass Transfer in Food Processing (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: course 110A or the equivalent; Applied Biological Systems Technology 110L recommended (may be taken concurrently). Rate processes: conduction, convection, and radiation heat transfer; microwave heating, refrigeration, freezing, psychrometrics, mass transfer into and between drying and storage. GE credit: SciEng | QL, SE, SL.—II. (II.) Young (change in existing course—eff. winter 13)

117. Design and Analysis for Sensory Food Science (4)
Lecture—3 hours; discussion—1 hour. Methods of design and analysis for sensory food science. Experimental designs and data treatment. Use of taste panels and consumer testing. Data analysis and computation including the relative merits and limitations of parametric and nonparametric approaches. Modifications for quality control. GE credit: SciEng | QL, SE.—I. (I.) O'Mahony (new course—eff. fall 13)

119. Chemistry and Technology of Milk and Dairy Products (4)
Lecture—4 hours; demonstrations and a field trip. Prerequisite: Biological Sciences 1A and 102, or consent of instructor. Composition, structure, and properties of milk and products derived from milk. Relates chemical, microbiological, and technological principles to commercial practices in processing of milk and dairy products. GE credit: SciEng | QL, SE, VL.—III. Rosenberg (change in existing course—eff. winter 13)

120L. Meat Science Laboratory (2)
Discussion—1 hour; laboratory—3 hours. Prerequisite: Biological Sciences 1A; course 120 may be taken concurrently. Laboratory exercises and student participation in the transportation of live animal to carcass and meat, structure and biochemical changes related to meat quality, chemical and sensory evaluation of meat, and field trips to packing plants and processing plants. (Some courses as Animal Science 120L) GE credit: SciEng | SE. (change in existing course—eff. winter 13)

123. Introduction to Enzymology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 103. Principles of physical, chemical and catalytic properties of enzymes and their importance. Purification, characterization, and quantitative evaluation of reaction properties and mechanisms. Specificity and mechanism of action illustrated by use of selected enzymes. (Former course Biochemistry and Biophysics 123.) GE credit: SciEng | QL, SE, VL.—III. (III.) G. Smith (change in existing course—eff. winter 13)

123L. Enzymology Laboratory (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: Biological Sciences 103, course 123 concurrently; Laboratory procedures involved in detection, purification and characterization of enzymes. (Former course Biochemistry and Biophysics 123L) GE credit: SciEng | QL, SE, VL, WE.—III. (III.) G. Smith (change in existing course—eff. winter 13)

127. Sensory Evaluation of Foods (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Agricultural Management and Rangeland Resources 120 or course 117. A critical examination of methods of sensory measurement applied to food and beverage systems; descriptive analysis and consumer tests and their application to quality assurance, product development, and optimization. GE credit: SciEng | QL, SE, WE.—II. (II.) (change in existing course—eff. winter 13)

131. Food Packaging (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 8B, Biological Sciences 1A, Physics 7C. Principles of food packaging. Functions of packaging. Properties of metal, glass, paper and plastic materials and packages. Design, fabrication, and applications of food packaging. Packaging of fresh and processed foods, including fruits and vegetables, dairy foods, beer and wine. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

151. Food Freezing (1)
(canceled course—eff. fall 13)

151Y. Food Freezing (1)
Discussion—1 hour; web virtual lecture. Prerequisite: course 110A or the equivalent. Mechanisms of ice crystallization, interpretation of freezing diagrams, and modes of heat transfer. Food properties at subfreezing temperatures, refreezing and rethawing, and estimation of freezing times. Industrial systems used in freezing foods. GE credit: SciEng | QL, SE.—III. (III.) Singh (new course—eff. fall 13)

159. New Food Product Ideas (3)
Discussion—1 hour; laboratory—6 hours. Prerequisite: upper division standing with background coursework in food science (course 50 or 100A), biological sciences (Biological Sciences 2A, 2B, 2C), or the physical sciences (Physics 7A, 7B, 7C or Chemistry 2A, 2B, 2C). Create, refine, test and present viable ideas for new food products. Activities include idea generation, consumer research, idea generation, concept screening, and new product concept presentations. GE credit: ArtHum or SocSci | AH or SS, OL, WE.—I. (I.) Biller (change in existing course—eff. spring 13)

160. Food Product Development (4)
Lecture—1 hour; discussion—1 hour; laboratory—6 hours. Prerequisite: upper division standing with background coursework in food science (course 50 or 100A), biological sciences (Biological Sciences 1A, 1B, 1C), or the physical sciences (Physics 5A, 5B, 5C or Chemistry 2A, 2B, 2C). Product implementation stage of food product development including preliminary product description, prototype development, product testing, and formal presentation of a new product development. GE credit: SciEng | OL, SE, VL.—III. (III.) (change in existing course—eff. winter 13)

190. Senior Seminar (1)
Seminar—1 hour. Prerequisite: senior standing or consent of instructor. Selected topics presented by students on recent advances in food science and technology. Reports and discussions concerning oral and written presentations, literature sources and career opportunities. GE credit: SciEng | OL, SE, WE.—I. (I.) Shoemaker (change in existing course—eff. winter 13)

192. Internship for Advanced Undergraduates (1-12)
Internship—3-36 hours. Prerequisite: consent of instructor. Work experience on or off campus in the practical application of food science. (P/NP grading only) GE credit: SE. (change in existing course—eff. winter 13)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only) GE credit: SE. (change in existing course—eff. winter 13)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only) GE credit: SE. (change in existing course—eff. winter 13)

Graduate
203. Food Processing (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 110A, Physics 5C or 7C, Chemistry 107B, or consent of instructor. Principles of food engineering applied to food processing. Relationship of Newtonian and non-Newtonian fluid properties to heat and
Forensic Science

New and changed courses in Forensic Science (FOR)

Graduate

207. Advanced Spectroscopy Methods in Forensic Science (3)
Lecture—3 hours. Restricted to Forensic Science Graduate program or consent of instructor. Discuss, evaluate and interpret advanced molecular spectra/structure, Infrared Spectroscopy, such as chemical applications of spectroscopic methods, vibrational/rotational spectra; electronic spectra, photoelectron spectroscopy generated by various analytical instruments used in forensic science community. Offered in alternate years.—I, III, IV. (I, II, III, IV.) Webb (new course—fall 14)

263. Forensic Computer Science Investigations (3)
Lecture—3 hours. Prerequisite: graduate student. Restricted to students in the Forensic Science Graduate program unless approved by instructor. Discuss the threats to the security of any kind of evidence that is captured, transmitted, or stored digitally and develop critical thinking and basic knowledge of computer forensic science issues in the evaluation of digital evidence. Offered in alternate years.—I, III. (I, II, III.) Peisert (new course—fall 13)

277. Forensic Genetics; Next Generation Techniques and Applications (3)
Lecture—3 hours. Prerequisite: undergraduate courses in fundamental and applied principles of genetics, biochemistry, and molecular biology, or consent of instructor. Restricted to Forensic Science Graduate students (GFOR) or consent of instructor. Review organization/function of the human genome, recent developments, next generation sequencing techniques including the preparation of DNA samples, principles of the new generation sequencing assay formats and biochemical reactions. Will include quantitative control parameter, and bioinformatic approaches. Offered in alternate years.—I, III. (I, II, III, IV.) Kanthasamy (new course—fall 13)

French

New and changed courses in French (FRE)

Lower Division

1. Elementary French (5)
Discussion—5 hours; laboratory—1 hour. Not open for credit to students who have taken course 1A. Introduction to French grammar and development of all language skills in a cultural context with special emphasis on communication. Students who have successfully completed French 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student’s P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP option is filed. GE credit: ArtHum | AH, WC.—I, II, III. (I, II, III.) Webb (change in existing course—fall 13)

21. Intermediate French (5)
Lecture/discussion—4 hours; laboratory—1 hour. Prerequisite: course 1A, 3, or 3S. Review of grammar and vocabulary acquired in the elementary sequence, as well as the study of new grammatical structures and a continuing enrichment of vocabulary through oral work in class, written exercises, readings and compositions. Not open for credit to students who have completed course 21S. GE credit: ArtHum | AH, OL, WC.—I, II, III. (I, II, III.) Simon (change in existing course—fall 14)

22. Intermediate French (5)
Lecture/discussion—4 hours; laboratory—1 hour. Prerequisite: course 21 or 21S. Continuation of course 21 or 21S. Review of grammar and vocabulary, as well as the study of new grammatical structures and a continuing enrichment of vocabulary. Not open for credit to students who have completed course 22S. GE credit: ArtHum | AH, OL, WC, WE.—I, II, III. (I, II, III, IV.) Simon (change in existing course—fall 13)

1A. Accelerated Intensive Elementary French (15)
Lecture/discussion—15 hours. Prerequisite: placement exam required. Introduction to French grammar and development of all language skills in a cultural context with special emphasis on communication. Special 12-week accelerated, intensive summer session course that combines the work of courses 1, 2, and 3. Not open for credit to students who have completed course 1, 1S, 2, 2S, 3, or 3S. GE credit: ArtHum | AH, WC.—I, II, III. (I, II, III.) Simon (change in existing course—eff. winter 14)

15. Elementary French (5)
Discussion—5 hours; laboratory—1 hour. Introduction to French grammar and development of all language skills in a cultural context with special emphasis on communication. Course is taught abroad. Students who have successfully completed French 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student’s P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP option is filed. Not open for credit to students who have completed course 1 or 1A. GE credit: ArtHum | AH, WC.—I, II. (I, II.) Simon (new course—fall 13)

2. Elementary French (5)
Discussion—5 hours; laboratory—1 hour. Prerequisite: course 1. Continuation of course 1. Not open for credit to students who have taken course 1A. GE credit: ArtHum | AH, WC.—I, II, III, IV. (I, II, III, IV.) Webb (change in existing course—winter 14)

2. Elementary French (5)
Discussion—5 hours; laboratory—1 hour. Prerequisite: course 1 or 1S. Continuation of course 1. Course is taught abroad. Not open for credit to students who have completed course 1A or 2. GE credit: ArtHum | AH, WC.—I, II. (I, II.) Simon (new course—fall 13)

3. Elementary French (5)
Discussion—5 hours; laboratory—1 hour. Prerequisite: course 2 or 2S. Not open for credit to students who have taken course 1A. Continuation of course 2. Course is taught abroad. Not open for credit to students who have completed course 1A or 3. GE credit: ArtHum | AH, WC.—I. (I.) Simon (new course—fall 13)

105. Advanced French Grammar (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 23 or 23S. Understanding of, and extensive practice with, various grammatical structures in French. Lexical-semantic, morphological, and syntactic analysis. Taught abroad. Not open for credit to students who have taken course 103. GE credit: WE.—I, II, III. (I, II, III.) Simon (change in existing course—fall 13)

1075. The Making of Modern France (4)
Lecture—3 hours; term paper. Prerequisite: course 100 or consent of instructor. Introduction to French culture through a historical approach to topics such as the nation-state, centralization of the monarchy, and the rise of public education, colonization, class and social relationships. Taught abroad. Not open for credit to students who have completed course 107. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE.—I, II. (I, II.) Simon (change in existing course—fall 13)

109. French Phonetics (4)
Lecture/discussion—3 hours; laboratory—1 hour. Prerequisite: course 23 or the equivalent. Introduction to the sound-inventory of French and practice in phonetic transcription, with a focus on ways in which phonetic contrasts signal grammatical contrasts; spoken forms and spelling; formal differences between the “Standard” and other varieties across the French-speaking world. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS.—III, IV. (I, II, III.) Simon (new course—fall 13)

Upper Division

100. Composition in French (4)
Lecture—3 hours; term paper. Prerequisite: course 23. Instruction and practice in expository writing in French, with emphasis on organization, correct syntax, and vocabulary building. GE credit: ArtHum | AH, WC, WE.—I, II, III. (I, II, III.) Simon (change in existing course—fall 13)

1055. Advanced French Grammar (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 23 or 23S. Understanding of, and extensive practice with, various grammatical structures in French. Lexical-semantic, morphological, and syntactic analysis. Taught abroad. Not open for credit to students who have taken course 103. GE credit: WE.—I, II. (I, II.) Simon (new course—fall 13)

225. Intermediate French (5)
Lecture/discussion—4 hours; laboratory—1 hour. Prerequisite: course 21 or 21S. Continuation of course 21 or 21S. Review of grammar and vocabulary, as well as the study of new grammatical structures and a continuing enrichment of vocabulary. Not open for credit to students who have completed course 22S. GE credit: ArtHum | AH, OL, WC, WE.—I, II. (I, II.) Simon (new course—fall 13)

53. French as a World Language (4)
1255. French Literature and Other Arts (4)
Lecture/discussion—3 hours, term paper. Prerequisites: consent of instructor. Concentrated study of works of a single author. May be repeated one time for credit when topic differs. GE credit: ArtHum | AH, VL, WC, WE—II. (I.) [new course—eff. fall 13]

1285. Topics in French Culture (4)
Lecture—3 hours; extensive writing. Prerequisite: course 100 or consent of instructor. In-depth study of a particular topic in French culture. Topics may include the Court of Louis XIV, the French Revolution, and Immigration. Taught abroad. May be repeated one time when credit for topic differs. GE credit: ArtHum | AH, WC, WE—II. (I.) [new course—eff. fall 13]

140. Study of a Major Writer (4)
Lecture—3 hours; term paper. Prerequisite: course 100; consent of instructor. Concentrated study of works of a single author. May be repeated one time for credit if author-subject changes. GE credit: ArtHum | AH, WC, WE—II. (I.) [change in existing course—eff. winter 13]

141. Selected Topics in French Literature (4)
Lecture—3 hours; term paper. Prerequisite: courses course 100; consent of instructor. Subjects and themes such as satiric and didactic poetry of the Middle Ages, poetry of the Pléiade, theater in the eighteenth century, pre-romantic poetry, autobiography, literature and film, etc. Taught abroad. May be repeated two times for credit when topic differs. GE credit: ArtHum | AH, WC, WE—II. (I.) [change in existing course—eff. winter 13]

1415. Selected Topics in French Literature (4)
Lecture—3 hours; term paper. Prerequisite: course 100; consent of instructor. Subjects and themes such as satiric and didactic poetry of the Middle Ages, poetry of the Pléiade, theater in the eighteenth century, pre-romantic poetry, autobiography, literature and film, etc. Taught abroad. May be repeated two times for credit when topic differs. GE credit: ArtHum | AH, WC, WE—II. (I.) [new course—eff. fall 13]

160. Linguistic Study of French-Sound and Form (4)
Seminar—3 hours; term paper. Prerequisite: course 109 and Linguistics 1, or consent of instructor. Introduction to the linguistic study of modern French, with focus on sound structure and form, inflection and derivation. GE credit: ArtHum or SocSci | AH or SS, WE—II. (I.) Russell Webb [change in existing course—eff. winter 13]

161. Linguistic Study of French—Form and Meaning (4)
Seminar—3 hours; term paper. Prerequisite: one of course 104, 105, 160, 162 and Linguistics 1, or permission of instructor. Introduction to the linguistic study of modern French, with focus on sentence construction and constituency, meaning and discourse functions. GE credit: ArtHum or SocSci | AH or SS—II. (III) Russell Webb [change in existing course—eff. winter 13]

162. History of the French Language (4)
Lecture—3 hours; term paper. Prerequisite: one from course 105, 109, 160, or 161; Linguistics 1 or consent of instructor. Main periods in development of the French language, from Latin to contemporary popular aspects, with emphasis on relationships between socio-cultural patterns and evolution of the language. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS, WC, WE—II. (I.) Webb [change in existing course—eff. fall 13]

194H. Special Study for Honors Students (4)
Independent study—4 hours. Prerequisite: open only to French majors of senior standing who qualify for honors program. Guided research, under the direction of a faculty member, leading to a senior honors thesis on a topic in French literature, civilization, or language studies. (P/NF grading only) GE credit: AH, WC, WE. [change in existing course—eff. winter 13]

195H. Honors Thesis (4)
Independent study—4 hours. Prerequisite: course 194H. Writing of an honors thesis on a topic in French literature, civilization, or language study under the direction of a faculty member. (P/NF grading only) GE credit: AH, WC, WE. [change in existing course—eff. winter 13]

Genetics
(A Graduate Group)

New and changed courses in Genetics (A Graduate Group) (GGG)
Graduate
201C. Molecular Genetic Mechanisms in Disease (4)
Lecture/discussion—4 hours. Prerequisite: Biological Sciences 101 or the equivalent. Pass one restricted to graduate students in genetics, microbiology or biochemistry and molecular biology graduate groups. Exploration of how basic mechanisms of molecular biology contribute to health and disease. Diseases related to animals, plants, and microbes will highlight fundamental concepts in the assembly, function and regulation of DNA, RNA, and protein—II. (III) Segal [change in existing course—eff. fall 12]

290A. Graduate Student Conference in Genetics (1)
Conference—1 hour. Restricted to Genetics Graduate Group students. Student-given seminars on topics in genetics, with critiques by instructor and peers. May be repeated for credit. [S/U grading only].—I, II, III (I, II, III) [new course—eff. fall 12]

292. Seminar in Genomics and Epigenomics (1)
Seminar—1 hour. Topics of current interest in genomics and epigenomics. May be repeated for credit. Offered in alternate years. (S/U grading only). [change in existing course—eff. winter 14]

Geography
(A Graduate Group)

New and changed courses in Geography (GEO)
Graduate
212. Water Resource Management (3)
Lecture—3 hours. Prerequisite: Civil and Environmental Engineering 114 or 111, and 142; Civil and Environmental Engineering 153 recommended. Engineering, institutional, economic, and social basis for managing local and regional water resources. Examples in the context of California’s water development and management. Uses of computer modeling to improve water management. [Same course as Civil and Environmental Engineering 267 I—II. (I) Lund [new course—eff. fall 13]

214. Seminar in Geographical Ecology (2)
Seminar—2 hours. Prerequisite: Evolution and Ecology 100 or 101 or consent of instructor. Recent developments in theoretical and experimental biogeography, historical biogeography and related themes in systematics, the biology of colonizing species, and related topics. (Same course as Population Biology 296, S/U grading only).—III. (III) Shapiro [new course—eff. spring 13]

230. Citizenship, Democracy, & Public Space (4)
Seminar—4 hours. Prerequisite: graduate standing or consent of instructor. In-depth study of political theory, philosophy, and the social sciences that focus on citizenship and the public sphere; development of critical perspective regarding decision-making of public spaces and global culture; discussion of contemporary case studies. (Same course as Landscape Architecture 200.)—III. (III) Rios [new course—eff. fall 12]

236. Transportation Planning and Policy (4)
Lecture/discussion—4 hours. Limited enrollment. Transportation planning process at the regional level, including the role of federal policy in shaping regional transportation planning, tools and techniques used in regional transportation planning, issues facing regional transportation planning agencies, and concepts and controversies. Transportation Planning and Policy 289 cannot repeat for credit. (Same course as Transportation Planning and Policy 220.) Offered irregularly.—Wheeler [new course—eff. fall 12]

240. Community Development Theory (4)
Lecture/discussion—4 hours. Introduction to theories of community development and different concepts of community, poverty, and development. Emphasis on building theory, linking applied development techniques to theory, evaluating development policy, and examining case studies of community development organizations and projects. (Same course as Community & Regional Development 240.)—I. (I) Hardy [new course—eff. winter 14]

244. Political Ecology of Community Development (4)
Lecture—4 hours. Prerequisite: graduate standing. Community development from the perspective of geographical political ecology. Social and environmental outcomes of the dynamic relationship between communities and land-based resources, and between social groups. Cases of community conservation and development in developing and industrialized countries. (Same course as Community and Regional Development 244.)—II. (II) Galt [new course—eff. winter 14]
246. The Political Economy of Transnational Migration (4)
Lecture—4 hours. Prerequisite: graduate standing. Theoretical perspectives and empirical research on social, cultural, political, and economic processes of transnational migration to the U.S. Discussion of conventional theories will precede contemporary comparative perspectives on class, race, ethnicity, citizenship, and the ethnic economy. (Same course as Community & Regional Development 246.)—II. (I, II, III.) Mokhtarian (new course—eff. winter 14)

248. Social Policy, Welfare Theories and Communities (4)
Seminar—4 hours. Prerequisite: graduate standing. Theories and comparative histories of modern welfare states and social policy in relation to legal/normative, organizational, and administrative aspects. Analysis of specific social issues within the U.S./California context. Not open for credit to students having completed Community & Regional Development 248A and 248B. (Same course as Community & Regional Development 248.) Offered in alternate years. (I, III.) Hirtz (new course—eff. fall 11)

279. Discrete Choice Analysis of Travel Demand (4)
Lecture—4 hours. Prerequisite: Civil and Environmental Engineering 114. Behavioral and statistical principles underlying the formulation and estimation of discrete choice models. Practical application of discrete choice models to characterization of choice behavior, hypothesis testing, and forecasting. Emphasis on computer exercises using real-world data sets. (Same course as Civil and Environmental Engineering 254.)—III. (I, II, III.) Mokhtarian (new course—eff. fall 12)

281. Transportation Survey Methods (4)
Lecture—4 hours. Prerequisite: Statistics 13; Civil and Environmental Engineering 251 recommended. Description of types of surveys commonly used in transportation demand modeling, including travel and activity diaries, attitudinal, panel, computer, and stated-response surveys. Discussion of sampling, experimental design, and survey design issues. Analysis methods, including factor, discriminant and cluster analysis. Not open for credit to students who have taken Civil and Environmental Engineering 252. (Same course as Transportation Technology and Policy 200.)—II. (I, II, III.) Mokhtarian (new course—eff. fall 12)

Geology

New and changed courses in Geology (GEL)

Lower Division

2G. The Blue Planet: Introduction to Earth Science Discussion (1)
Discussion—1 hour. Prerequisite: course 2 concurrently. Small group discussion and preparation of short papers for course 2. GE credit: SciEng, Wrt1 | SE, WE—II. (I, II.) Day (change in existing course—eff. winter 13)

3G. History of Life: Discussion (1)
Discussion—1 hour. Prerequisite: course 3 concurrently. Small group discussion and preparation of short papers for course 3. GE credit: SciEng, Wrt1 | SE, WE—II. (I, II.) Mokhtarian (change in existing course—eff. winter 13)

3L. History of Life Laboratory (1)
Laboratory—3 hours. Prerequisite: course 3 concurrently. Exercises assess students as the closer to interpreting ancient life, including their functional morphology, paleoecology, and evolution. GE credit: SciEng | SE—II. (I, II.) Motani (change in existing course—eff. winter 13)

12. Evolution and Paleobiology of Dinosaurs (2)
Lecture—2 hours. Introduction to evolutionary biology, paleobiology, ecology and paleoecology, using dinosaurs as case studies. GE credit: SciEng | SE, VL, WE—II. (II.) Carlson (change in existing course—eff. winter 13)

17. Earthquakes and Other Earth Hazards (2)
Lecture—2 hours. Impact of earthquakes, tsunami, volcanoes, landslides, and floods on humans, structures, and the environment. Discussion of the causes and effects of disasters and catastrophes, and on prediction, preparation, and mitigation of natural hazards. GE credit: SciEng | SE, SL, WE—II. (II.) Kellogg (change in existing course—eff. fall 13)

18. Energy and the Environment (3)
Lecture—3 hours. Conventional and alternative energy resources and their environmental impacts. Basic principles, historical development, current advantages and disadvantages of future prospects. Oil, natural gas, coal, nuclear, wind, geothermal, water, tidal, solar, hydrogen, and other sources of energy for the 21st century. GE credit: SciEng | SE, SL, WE—II. (II.) Osleger (new course—eff. winter 10)

20. Geology of California (2)
Lecture—2 hours. The geologic history of California, the origin of rocks and the environments in which they were formed, the structure of the rocks and the interpretation of their structural history, mineral resources, and appreciation of the California landscape. GE credit: SciEng | SE, SL, VL, WE—II. (II.) Osleger (change in existing course—eff. winter 13)

25. Geology of National Parks (3)
Lecture—3 hours. Appreciation of the geologic framework underlying the inherent beauty of U.S. National Parks. Field trips to individual parks to geologic processes such as mountain building, volcanism, stream erosion, glacial action and landscape evolution. GE credit: SciEng | SE, SL, VL—II. (I, II.) Osleger (change in existing course—eff. winter 14)

50. Physical Geology (3)
Lecture—3 hours. Prerequisite: high school physics and chemistry. The Earth, its materials, their internal and external processes, its development through time by sea-floor spreading and global plate tectonics. Students with credit for course 1 or the equivalent may receive only 2 units for course 50. GE credit: SciEng | SE—II. (I, II.) Billen, Lesher (change in existing course—eff. winter 13)

50L. Physical Geology Laboratory (2)
Lecture—3 hours. Prerequisite: high school physics and chemistry. The Earth, its materials, their internal and external processes, its development through time by sea-floor spreading and global plate tectonics. Students with credit for course 1 or the equivalent may receive only 2 units for course 50. GE credit: SciEng | SE, SL, WE—II. (I, II.) Billen, Lesher (change in existing course—eff. winter 13)

60. Earth Materials: Introduction (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Chemistry 2A; Mathematics 16A or 21A; course 1 or 50, 50L. Physical and chemical properties of rocks, minerals and other earth materials; structure and composition of rock-forming minerals; formation of minerals by precipitation from silicate liquids and aqueous fluids and by solid state transformations. GE credit: SciEng | SE—II. (I, II.) Day (change in existing course—eff. winter 13)

62. Optical Mineralogy (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 60 (may be taken concurrently); high school physics is strongly recommended. Optical properties of inorganic crystals; techniques of mineral identification using the polarizing microscope; strategies for studying rocks in thin section. GE credit: SciEng | SE, VL, WE—II. (I, II.) Day (change in existing course—eff. winter 13)

81. Learning in Science and Mathematics (2)
Lecture/discussion—2 hours; field work—2 hours. Exploration of how students learn and develop understanding in science and mathematics classrooms. Introduction to case studies and interview techniques and their use in K-6 classrooms to illuminate factors that affect student learning. Limited enrollment. (Same course as Education 81.) (P/NP grading only) GE credit: SS, VL, WE—II. (I, II, III.) (change in existing course—eff. winter 13)

91. Geology of Campus Waterways (1)
Lecture/discussion—1 hour; field work—1 hour. Research characterizing geologic processes in waterways on campus including links among hydrologic, atmospheric, physical, and human processes; carbon cycling and interpreting processes from sediments; field research techniques; research project design and implementation; implications of results for society and environmental policy. May be repeated for credit three times. (P/NP grading only) GE credit: SE, SL, VL—Sumner (change in existing course—eff. winter 13)

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: consent of instructor; lower division standing. Work/lake experience on and off campus in all subject areas offered by the department. Internships supervised by a member of the faculty. May be repeated for credit up to 12 units. (P/NP grading only) GE credit: SE—II, III, (I, II, III.) (change in existing course—eff. winter 13)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. May be repeated for credit. May be repeated for credit up to three times. (P/NP grading only) GE credit: SE—II, III, (I, II, III.) (change in existing course—eff. winter 13)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor; lower division standing. (P/NP grading only) GE credit: SE. (change in existing course—eff. winter 13)

Upper Division

101. Structural Geology (3)
Lecture—3 hours. Prerequisite: courses 50 and 50L, Physics 7A or 9A, Mathematics 168 or 218, or consent of instructor. Study of processes and products of rock deformation. Introduction to structural geology through a survey of the features and geometries of faults and folds, techniques of strain analysis, and continuum mechanics of rock deformation. GE credit: SciEng | SE—II. (I, II.) Cowgill, Oskin (change in existing course—eff. fall 13)

101L. Structural Geology Lab (2)
Laboratory—6 hours; fieldwork—2 hours. Prerequisite: courses 50 and 50L, Physics 7A or 9A, and 101 (may be taken concurrently); consent of instructor. Class size limited to 15 students per session. Laboratory study of the processes and products of rock deformation. Introduction to the practice of...
103. Field Geology (3)
Fieldwork and laboratory—9 hours; 7-8 days on weekends during quarter. Prerequisite: course 101L or consent of instructor. Field mapping projects and writing geological reports. Weekly classroom meetings devoted to preparation of maps, cross sections, stratigraphic sections, rock descriptions, and reports. GE credit: SciEng | SE, VL—II. (II.) Cowgill, Oskin [change in existing course—eff. fall 13]

107. Earth History: Paleobiology (3)
Lecture—3 hours. Prerequisite: courses 3-3L or Biological Sciences 1B; course 107 (may be taken concurrently). Methods of stratigraphic and sedimentologic analysis of modern and ancient sediments. Identification of major sediment and sedimentary rock types. Outcrop and subsurface analysis of sedimentary basins. GE credit: SciEng | SE—II. (III.) Carlson, Motani [change in existing course—eff. winter 13]

109L. Earth History: Sediments and Strata Laboratory (2)
Laboratory—6 hours (includes four 1-day field trips). Prerequisite: course 109 (may be taken concurrently). Field geology and geophysics at research sites; participants from diverse scientific backgrounds. Restricted to restricted to advanced students in the physical sciences, biological sciences, or engineering. GE credit: SciEng | QL—II. (II.) Sumner [change in existing course—eff. winter 13]

116N. Oceanography (3)
Lecture—2 hours; laboratory—3 hours; field work. Prerequisite: one of Geology 1, 2, 16 or 50. Advanced oceanographic topics: Chemical, physical, biological, and geological processes; research methods and data analysis; marine resources, anthropogenic impacts, and climate change; integrated earth/ocean/atmosphere systems; weekly lab and one two-day field trip. (Same course as Environmental Science & Policy 116N.) GE credit: SciEng | SE, VL—II. (II.) Hill, McClain, Spero [new course—eff. winter 13]

120. Origins: From the Big Bang to Today (3)
Lecture—3 hours. Limited enrollment. Long-term and large-scale perspectives on the origins of the universe, stars and planets, life, human evolution, the rise of civilization and the modern world. Multidisciplinary approach to ’Big History’ involving cosmology, astronomy, geology, climate, biology, anthropology, archeology and traditional history. GE credit: SciEng | SE—II. (II.) Osler [new course—eff. winter 13]

129. Sample Preparation and Techniques for Petrology (1)
Laboratory—3 hours. Prerequisite: courses 60-60L. Introduction to petrographic laboratory techniques for petrographers. Topics covered may include thin and polished section preparation, rock crushing/grinding, mineral separation, staining, and photomicroscopy. (P/NP grading only.) GE credit: SE. [change in existing course—eff. winter 13]

130. Non-Renewable Natural Resources (3)
Lecture—3 hours. Prerequisite: course 1. Origins, occurrence, distribution, and evaluation of non-renewable resources, including metallic, nonmetallic, and energy-producing materials. Problems of discovery, production, and management. Estimations and limitations of reserves. Effects on political and economic aspects. Offered in alternate years. GE credit: SciEng | SE, VL—III. (I.) Turcotte [change in existing course—eff. winter 13]

131. Risk: Natural Hazards and Related Phenomena (3)
Lecture—3 hours. Prerequisite: upper division standing. Risk, prediction, prevention and response for earthquakes, volcanic eruptions, landslides, floods, storms, fires, impacts, global warming. GE credit: SciEng | SE, VL—II. (I.) Turcotte [change in existing course—eff. winter 13]

136. Ecogeomorphology of Rivers and Streams (5)
Lecture—1 hour; discussion/laboratory—2 hours; fieldwork; term paper or discussion. Prerequisite: upper division or graduate standing in any physical sciences, biological sciences, environmental sciences, or engineering. GE credit: SciEng | SE, WE—II. (II.) Mount, Moyle [change in existing course—eff. winter 13]

139. Rivers: Form, Function and Management (4)
Lecture—3 hours; fieldwork—3 hours. Prerequisite: courses 50, 50L, or equivalent; Mathematics 16B or 21B recommended. Analysis of river form and processes, emphasis on fluvial geomorphology, and river and stream restoration; case studies to illustrate concepts and applications. Two weekend field trips required. GE credit: SciEng | SE—II. Mount [change in existing course—eff. winter 13]

141. Evolutionary History of Vertebrates (3)
Lecture—3 hours. Evolutionary history of vertebrates; fossil record and phylogeny; timing of major evolutionary events; appearance of major vertebrate groups; physical constraints in vertebrate evolution; paleobiogeography; and vertebrates as sociobiological systems. Offered in alternate years. GE credit: SciEng | SE—II. (II.) Motani [change in existing course—eff. winter 13]

141L. Evolutionary History of Vertebrates Laboratory (1)
Laboratory—3 hours. Prerequisite: course 141 (may be taken concurrently). Augments lecture course 141 through handling of specimens enabling in-person examination of three dimensional features observed in vertebrate skeletons. Both fossil and living. Offered in alternate years. GE credit: SciEng | SE—II. (II.) Motani [change in existing course—eff. winter 13]

142. Basin Analysis (3)
Laboratory—3 hours; lecture—2 hours. Prerequisite: courses 50, 50L, and 109. Analysis of sedimentary basins from initiation to maturity, including controls on sedimentary fill, subsidence analysis, sequence stratigraphy, core logs, and applications to petroleum exploration and hydrology. One two-day field trip. Offered in alternate years. GE credit: SciEng | SE, VL—II. (I.) Sumner [change in existing course—eff. winter 13]

144. Historical Ecology (3)
Lecture—3 hours. Prerequisite: upper division course in environmental science or ecology, or an introductory course in paleobiology. Ancient ecosystems and the factors that caused them to change. Species, expansion, evolution of new modes of life, geologically induced variations, and extinction provide historical perspective on the biosphere of future. GE credit: SciEng | SE, WE—II. (I.) Vermeij [change in existing course—eff. winter 13]

146. Radiogenic Isotope Geochemistry and Cosmochronology (3)
Lecture—3 hours. Prerequisite: Chemistry 2C, Physics 7C, and Mathematics 16C. Basic principles of nuclear chemistry and physics applied to geology to determine the ages of terrestrial rocks, meteorites, archeological objects, age of the Earth, to trace geological/environmental processes, and explain formation of the chemical elements in the Universe. Offered in alternate years. GE credit: SciEng | QL, SE—(II.) Yin [change in existing course—eff. winter 13]

147. Geology of Ore Deposits (4)
Lecture—3 hours; laboratory—3 hours, optional one-weekend field trip. Prerequisite: Chemistry 2C or Hydrologic Science 134, courses 60, 62, and 105. Tectonic, lithologic and geochemical setting of major metallic ore deposits; type deposition; ore deposit genesis, water/rock interaction and the environmental effects of mining. Offered in alternate years. GE credit: SciEng | QL, SE—II. (III.) Zierenberg [change in existing course—eff. winter 13]

148. Stable Isotopes and Geochemical Tracers (3)
Lecture—3 hours; fieldwork. Prerequisite: courses 50 and 50L or Chemistry 2B or 2D; consent of instructor. Geology, geochemistry, and geophysics of geothermal systems, including electrical power generation and direct use applications. Includes one day field trip on a weekend during the quarter. GE credit: SciEng | SE—II. (II.) Zierenberg [new course—eff. spring 13]

150A. Physical and Chemical Oceanography (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 116/Environmental Science and Policy 116; Physics 98; Mathematics 210D; Chemistry 2C; or upper division standing in a natural science and consent of instructor. Physical and chemical properties of seawater, fluid dynamics, air-sea interaction, currents, waves, tides, mixing, major oceanic chemical cycles. (Same course as Environmental Science and Policy 150A.) GE credit: SciEng | QL, SE—II. (I.) McClain, Spero [change in existing course—eff. winter 13]

150B. Geological Oceanography (3)
Lecture—3 hours. Prerequisite: course 50 or 116. Introduction to the origin and geologic evolution of ocean basins. Composition and structure of oceanic crust; marine volcanism; and deposition of marine sediments. Interpretation of geologic history of the ocean floor in terms of tectonic theory. (Same course as Environmental Science and Policy 150B.) GE credit: SciEng | SE—II. (II.) McClain [change in existing course—eff. winter 13]
150C. Biological Oceanography (4)
Lecture—3 hours; discussion—1 hour; fieldwork—one weekend field trip required. Prerequisite: Biological Sciences 1A and a course in general ecology or consent of instructor. Ecology of major marine habitats, including intertidal, shelf benthic, deep-sea and plankton communities. Existing knowledge and contemporary issues in research. Segment devoted to human use. (Same course as Environmental Science and Policy 150C.) GE credit: SciEng | SE, SL.—IV, IV (I-V) Hill (change in existing course—eff. winter 13)

152. Palaeobiology of Protists (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: courses 107 or Biological Sciences 1A or consent of instructor. Morphology, systematics, evolution, and ecology of single-celled organisms that are preserved in the fossil record. Offered in alternate years. GE credit: SciEng | SE.—Hill (change in existing course—eff. winter 13)

156. Hydrogeology and Contaminant Transport (5)
Lecture—3 hours; laboratory—3 hours; term paper. Prerequisite: Hydrologic Science 145, Civil and Environmental Engineering 144 or the equivalent. Physical and chemical processes affecting groundwater flow and contaminant transport, with emphasis on realistic hydrogeologic systems. Groundwater geochemistry and hydrogeochemistry. Fundamentals of groundwater flow and transport analysis. Laboratory includes field pumping test and work with physical and computer models. (Same course as Hydrologic Science 146.) GE credit: SciEng | SE.—II, II (I-II) Fogg (change in existing course—eff. winter 13)

160. Geologic Data Analysis (3)
Lecture/discussion—3 hours. Prerequisite: Mathe-matics 21A or the equivalent. Introduction to quantitative methods in analyzing geological data including basic principles of statistics and probability, error analysis, hypothesis testing, inverse theory, time series analysis, and directional data analyses. Use of computer in lectures and homework. GE credit: SciEng | QL, SE.—I, II Bilen (change in existing course—eff. winter 13)

161. Geophysical Field Methods (3)
Lecture/discussion—3 hours; term paper. Prerequi-site: course 1 or 50, Mathematics 21C, Physics 7C or 9C, or consent of instructor. Geophysical methods applied to determining subsurface structure in tectonic, hydrogeology, geotechnical engineering, hydrocarbon and mineral exploration. Theory, survey design, and interpretation of gravity, electrical resistivity, electromagnetism, reflection and refraction seismology, and ground-penetrating radar measurements. GE credit: SciEng | QL, SE.—I, II, III Fogg (change in existing course—eff. winter 13)

162. Geophysics of the Solid Earth (3)
Lecture—3 hours. Prerequisite: Mathematics 21C, Physics 5C or 7C, or consent of instructor. Theory and use of physics in the study of the solid earth. Gravity, magnetism, paleomagnetism, and heat flow. Application to the interpretation of the regional and large-scale structure of the earth and to plate tectonics. Offered in alternate years. GE credit: SciEng | QL, SE.—II, II Kellogg (change in existing course—eff. winter 13)

163. Planetary Geology and Geophysics (3)
Lecture—3 hours. Prerequisite: Mathematics 21C, Physics 7C or 9C, and course 50 or 36 or Astronomy 10, or consent of instructor. Principles of planetary science. Planetary dynamics, including orbital mechanics, tidal friction, and ring dynamics. Theory of planetary interiors, gravitational fields, rotational dynamics. Physics of planetary atmospheres. Geophysical processes, landforms and their modification. Methods of analysis from Earth-based observations and spacecraft. GE credit: SciEng | QL, SE.—II, II (I-II), III Kellogg. Yin (change in existing course—eff. winter 13)

175. Advanced Field Geology (3)
Lecture—3 hours; fieldwork—6 hours. Prerequisite: consent of instructor. Advanced field studies of selected geologic terrains, interpretation and discussion of field observations. May be repeated twice for credit when instructors varies. (P/NP grading only) GE credit: SE.—I, II, III Cooper, Roeske (change in existing course—eff. winter 13)

181. Teaching in Science and Mathematics (2)
Lecture/discussion—2 hours; fieldwork—2 hours. Prerequisite: major in mathematics, science, or engineering; or completion of a core sequence of science or calculus and consent of the instructor. Class size limited to 40 students per section. Exploration of effective teaching practices based on examination of how middle school students learn math and science. Selected readings, discussion and field experience in middle school classrooms. (Same course as Education 181) (P/NP grading only.) GE credit: SS, WE.—I, II, III, II, III, III Horn (change in existing course—eff. winter 13)

182. Field Studies in Marine Geochemistry (2-8)
Lecture—3 hours; laboratory—1.3 hours; fieldwork—6-40 hours. Prerequisite: consent of instructor. Marine geochemistry with the opportunity of going to sea or into the field. Some techniques of sea-floor mapping using Bottoms' photomapping, marine chemical sampling, and method of data reduction and sample analysis. Analysis of data/samples collected. GE credit: SciEng | SE.—II Hill (change in existing course—eff. winter 13)

183. Teaching High School Mathematics and Science (3)
Lecture/discussion—2 hours; field work. Prerequi-site: course 81/Education 81 or course 181/Educa-tion 181 and major in mathematics, science, or engineering; or completion of a one-year sequence of science or mathematics and consent of the instructor. Limited to 40 students per section. Exploration and creation of effective teaching practices based on examination of how high school students learn mathematics and science. Field experience in high school classrooms. (Same course as Education 183.) GE credit: SocSci | QL, SS, WE.—I, II, III, II, III, III Passmore, Stevenson (change in existing course—eff. fall 13)

190. Seminar in Geology (1)
Discussion—1 hour; seminar—1 hour; written abstracts. Prerequisite: upper division standing in Geology. Presentation and discussion of current topics in geology by visiting lecturers, staff, and students. May be repeated for credit. (P/NP grading only.) GE credit: SE.—I, II, III, II, III, III (change in existing course—eff. winter 13)

192. Internship in Geology (1-12)
Internship. Prerequisite: upper division standing; project approval prior to internship. Supervised work experience in geology. May be repeated for credit for a total of 10 units. (P/NP grading only.) GE credit: SE. (change in existing course—eff. winter 13)

194A-194B. Senior Thesis (3-3)
Prerequisite: open to Geology majors who have completed 135 units and who do not qualify for the honors program. Guided independent study of a selected topic, leading to the writing of a senior thesis. [Deferred grading only, pending completion of sequence.] GE credit: SciEng | SE, WE. (change in existing course—eff. winter 13)

194HA-194HB. Senior Honors Project (3-3)
Independent study—9 hours. Prerequisite: open to Geology majors who have completed 135 units and who qualify for the honors program. Guided independent study of a selected topic, leading to the writing of an honors thesis. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE, WE. (change in existing course—eff. winter 13)

198. Directed Group Study (1-5)
Prerequisite: senior standing in Geology or consent of instructor. GE credit: SciEng | SE. (change in existing course—eff. winter 13)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.) GE credit: SE. (change in existing course—eff. winter 13)

German

New and changed courses in German (GER)

Lower Division

1. Elementary German (5)
Discussion—5 hours; laboratory—1 hour. Introduction to German grammar and development of all language skills in a cultural context with special emphasis on communication. Students who have successfully completed German 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged for the student's P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed. Not open to students who have taken course 1A. GE credit: ArtHum | AH, WC.—I, II, III, II, III, III Arnett (change in existing course—eff. winter 13)

2. Elementary German (5)
Discussion—5 hours; laboratory—1 hour. Prerequi-site: course 1. Continuation of course 1 in areas of grammar and basic language skills. Not open for credit to students who have completed 2 or 3 in the 10th or higher grade in high school. GE credit: ArtHum | AH, WC.—I, II, III, II, III Arnett (change in existing course—eff. winter 13)

3. Elementary German (5)
Discussion—5 hours; laboratory—1 hour. Prerequi-site: course 2. Completion of grammar sequence and continuing practice of all language skills through cultural texts. Not open to students who have taken course 1A. GE credit: ArtHum | AH, WC.—I, II, II, III Arnett (change in existing course—eff. winter 13)

6. Conversational German (4)
Discussion—3 hours; term paper. Prerequisite: course 3. Course 6 may be taken concurrently with course 20. Designed to develop intermediate lan-guage skills with special emphasis on communica-tion and grammatical accuracy. GE credit: ArtHum | AH.—II. (change in existing course—eff. winter 13)

20. Intermediate German (4)
Lecture/discussion—3 hours; extensive writing. Prerequi-site: course 3. May be taken concurrently with course 20. Designed to develop intermediate lan-guage skills with special emphasis on means of written exercises; expanding vocabulary through readings of modern texts. GE credit: ArtHum | AH, WC.—I, II, II, II (change in existing course—eff. winter 13)
21. Intermediate German (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 22. Review of grammatical principles by means of written exercises; expanding of vocabulary through readings of modern texts. GE credit: ArtHum | AH, WC.—II, III, (II, III).
(change in existing course—eff. winter 13)

22. Intermediate German (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 22. Review of grammatical principles by means of written exercises; expanding of vocabulary through readings of modern texts. GE credit: ArtHum | AH, WC.—II, III, (II, III).
(change in existing course—eff. winter 13)

Upper Division

103. Writing Skills in German (4)
Lecture—3 hours; extensive writing. Prerequisite: course 22. Practice in different kinds of writing, such as abstracts, correspondence, lecture summaries, analysis of or response to short literary works. GE credit: ArtHum | AH, WC, WE.
(change in existing course—eff. winter 13)

104. Translation (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 22. Exercises in German-to-English, English-to-German translation using texts from the areas of culture and commerce. Not open for credit to students who have completed course 104A. Offered in alternate years. GE credit: ArtHum | AH, OL, VL, WE.
(change in existing course—eff. winter 13)

116. Readings in Jewish Writing and Thought in German Culture (4)
Lecture—3 hours; term paper. Prerequisite: Religious Studies 23 or consent of instructor. Historical tradition of Jewish thought in the German cultural context; unique contributions of Jewish writers to culture of the German-speaking world; what it means to be “other” in the mainstream culture. No credit will be given to those students who have completed Humanities 121. May be repeated two times for credit if topic differs. Offered in alternate years. (Same course as Jewish Studies 116.) GE credit: ArtHum, Div, Wrt. | AH, OL, WC, WE.—(I).
(change in existing course—eff. fall 11)

144. Marx, Nietzsche, Freud (4)
Lecture/discussion—3 hours; term paper. Study of major texts of Marx, Nietzsche, and Freud, selected with an eye to their impact on 20th century economics, ethics, and attitudes toward era. Particular focus on conceptions of the self and the individual’s relation to society. Offered in alternate years. (Same course as Humanities 144.) GE credit: ArtHum, Wrt | AH, WC.—III.
(change in existing course—eff. fall 11)

Greek

New and changed courses in Greek (GRK)

Lower Division

1. Elementary Greek (5)
Lecture—5 hours. Introduction to the basic grammar and vocabulary of Classical and New Testament Greek. Development of translation skills with emphasis on Greek-English. (Students who have successfully completed 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student’s P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed.) GE credit: ArtHum | AH.—II, (I, II) Popescu
(change in existing course—eff. winter 13)

2. Elementary Greek (5)
Lecture—5 hours. Prerequisite: course 1. Continuation of course 1. GE credit: ArtHum | AH.—II, (I, II) Popescu
(change in existing course—eff. winter 13)

2NT. Elementary New Testament Greek (1)
(change in existing course—eff. winter 13)

3. Intermediate Greek (5)
Lecture—5 hours. Prerequisite: course 2. Continuation of course 2. Selected readings from Greek authors. GE credit: ArtHum | AH.—III, (III) Popescu
(change in existing course—eff. winter 13)

3NT. Elementary New Testament Greek (1)
Lecture—1 hour. Prerequisite: course 3 (concurrently). Supplementary study of New Testament Greek. GE credit: ArtHum | AH.—III, (III) Popescu
(change in existing course—eff. winter 13)

Upper Division

100. Readings in Greek Prose (5)
Lecture/discussion—4 hours, term paper. Prerequisite: course 3 or equivalent. Review of Greek morphology, syntax, and vocabulary. Readings in Greek prose authors, including Xenophon. GE credit: ArtHum | AH, WC, WE.—I.
(change in existing course—eff. winter 13)

105. Attic Orators (4)
Lecture—3 hours; term paper. Prerequisite: course 100 or equivalent. Selected readings from the orators of 4th and 5th century Athens. May be repeated for credit if topic differs and with consent of instructor. Offered irregularly. GE credit: ArtHum | AH, WC, WE.
(change in existing course—eff. winter 13)

121. Greek Prose Composition (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100 or equivalent. Intensive grammar and vocabulary review through exercises in Greek prose composition. Offered in alternate years. GE credit: ArtHum | AH
(change in existing course—eff. winter 13)

130. Readings in Later Greek (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100 or equivalent. Translation and discussion of selected readings from Hellenistic to Byzantine Greek literature. Offered in alternate years. GE credit: ArtHum | AH, WE.
(change in existing course—eff. winter 13)

Hebrew

New and changed courses in Hebrew (HEB)

Lower Division

1. Elementary Hebrew (5)
Lecture/discussion—4 hours; laboratory—1 hour. Speaking, listening, comprehension, reading and writing fundamentals of modern Hebrew. (Students who have successfully completed, with a C or better, Hebrew 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student’s P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed.) GE credit: ArtHum | AH.—II, (I, II) Franco
(change in existing course—eff. winter 13)

1A. Accelerated Intensive Elementary Hebrew (15)
Lecture/discussion—15 hours. Special 12 week accelerated, intensive summer session course that combines the work of courses 1, 2, and 3. Introduces to Hebrew grammar and development of language skills in a cultural context with emphasis on communication. Not open to students who have completed course 1, 2, or 3. GE credit: ArtHum | AH, WC,—IV. (IV)
(change in existing course—eff. winter 13)

2. Elementary Hebrew (5)
Lecture/discussion—4 hours; laboratory—1 hour. Prerequisite: course 1 or the equivalent. Speaking, listening, comprehension, reading and writing fundamentals of modern Hebrew. GE credit: ArtHum | AH.—II. (II) Franco
(change in existing course—eff. winter 13)

3. Elementary Hebrew (5)
Lecture/discussion—4 hours; laboratory—1 hour. Prerequisite: course 2 or the equivalent. Speaking, listening, comprehension, reading and writing fundamentals of modern Hebrew. GE credit: ArtHum | AH,—III. (III) Franco
(change in existing course—eff. winter 13)

Upper Division

100AN. Advanced Modern Hebrew I (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100 or consent of instructor. Students who have taken course 100A as 2nd year Hebrew may take course 100AN. Third year Hebrew. Advanced grammar and composition. Focus on reading of literary texts, oral skills and accuracy in writing. GE credit: ArtHum | AH.—II, (I, II) Yellowlees
(change in existing course—eff. winter 13)

100BN. Advanced Modern Hebrew II (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100AN or consent of instructor. Students who have taken course 100B as 2nd year Hebrew may take course 100BN. Third year Hebrew.
History

New and changed courses in History (HIS)

Lower Division

4A. History of Western Civilization (4)
Lecture—3 hours; discussion—1 hour. Growth of western civilization from antiquity to the Renaissance. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—I, II. McKee (change in existing course—eff. winter 13)

4B. History of Western Civilization (4)
Lecture—3 hours; discussion—1 hour. Development of western civilization from the Renaissance to the Eighteenth Century. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—II. Landau, Stuart (change in existing course—eff. winter 13)

4C. History of Western Civilization (4)
Lecture—3 hours; discussion—1 hour. Development of Western Civilization from the Eighteenth Century to the present. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—I, II, III. Campbell, Saller (change in existing course—eff. winter 13)

8. History of Indian Civilization (4)
Lecture—3 hours; discussion—1 hour; written reports. Survey of Indian civilization from the rise of cities (ca. 2000 B.C.) to the present, emphasizing themes in religion, social and political organization, and art and literature. Perspectives on contemporary China are provided. GE credit: ArtHum or SocSci, Div | AH or SS, WC, WE.—II. Sen (change in existing course—eff. winter 13)

9A. History of East Asian Civilization (4)
Lecture—3 hours; discussion—1 hour. Surveys traditional Chinese civilization and its modern transformation. Emphasis on thought and religion, political and social life, art and literature. Perspectives on contemporary China are provided. GE credit: ArtHum or SocSci, Div | AH or SS, WC, WE.—I, II, III. Bosler (change in existing course—eff. winter 13)

9B. History of East Asian Civilization (4)
Lecture—3 hours; discussion—1 hour. Surveys traditional Japanese civilization and its modern transformation. Emphasis is on thought and religion, political and social life, art and literature. Perspectives on contemporary Japan are provided. GE credit: ArtHum or SocSci, Div | AH or SS, WC, WE.—II. Kim (change in existing course—eff. winter 13)

10B. World History, c. 1350-1850 (4)
Lecture—3 hours; discussion—1 hour. Major topics in world history from the 14th century to the beginning of the 19th century. Topics will vary but may include oceans as systems of human communication and conflict, the global consequences of “industrial revolutions” in Europe and Asia, etc. GE credit: ArtHum or SocSci, Div | AH or SS, WC, WE.—I, II, Harris, Stolzenberg (change in existing course—eff. winter 13)

10C. World History III (4)
Lecture—3 hours; discussion—1 hour. Major topics from world history of the 19th and 20th centuries, emphasizing the rise and fall of Western colonial empires; Cold War and the superpowers; the spread of the nation-state; and processes of globalization. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—II, III. Dickinson, El Shakry (change in existing course—eff. winter 13)

11. History of the Jewish People in the Modern World (4)
Lecture—3 hours; discussion—1 hour. Histories and cultures of the Jews since 1492. Topics include the making of Jewish diasporas, roots of antisemitism, the Holocaust in images and texts, changing ideas of the self, Jews in American contemporary history, and the Jewish past. Offered in alternate years. GE credit: ArtHum | AH, DD, VI, WC, WE.—(I) Miller (change in existing course—eff. fall 12)

15. Introduction to African History (4)
Lecture—3 hours; discussion—1 hour. Examination of the long-range historical context as background to current conditions in Africa. Includes the early development of African civilizations, the slave trade and its abolition, 20th century colonization, and African independent states. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—II. Hartigan-O’Connor, Keliman, Smolenski, Taylor (change in existing course—eff. winter 13)

17A. History of the United States (4)
Lecture—3 hours; discussion—1 hour. The experience of the American people from the Colonial Era to the Civil War. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—I, II, III. (I, II) Hartigan-O’Connor, Keliman, Smolenski, Taylor (change in existing course—eff. winter 13)

17B. History of the United States (4)
Lecture—3 hours; discussion—1 hour. The experience of the American people from the Cold War to the End of the Cold War. Not open for credit to students who have completed course 17C. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—II, III. (I, II) Olmsted, Opreza, Roughway (change in existing course—eff. winter 13)

72A. Social History of American Women and the Family (4)
Lecture—3 hours; discussion—1 hour. Social and cultural history of women, sex roles and the family from colonial America until the late twentieth century emphasizing changes resulting from the secularization, commercialization, and industrialization of American society. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—II. Hartigan-O’Connor (change in existing course—eff. winter 13)

72B. Social History of American Women and the Family (4)
Lecture—3 hours; discussion—1 hour. Social and cultural history of women, sex roles, and the family in twentieth-century America, emphasizing demographic, social, and cultural aspects of women’s movement. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—III. Materson (change in existing course—eff. winter 13)

Seminar—4 hours; term paper. Prerequisite: consent of instructor. History of the attitudes and behavior of Americans toward their natural environment and their technology, from colonial times to the present. No final examination. Limited enrollment. GE credit: ArtHum or SocSci | AH or SS, WE—III. 

Upper Division

109B. Environmental Change, Disease and Public Health (4)
Lecture/discussion—3 hours; term paper. Analysis of environmental changes from prehistory to the present and their influence on disease distribution, virulence and public health; many of these changes have been driven by human action and transforma
tions of pathogens have accelerated under globaliza-

tions. GE credit: SciEng or SocSci, Div | SE or SS, SL.—I. (I.) Miller

110A. Colonialism and the Making of the Modern World (4)

Lecture—3 hours; term paper. History of the modern world, focusing on struggles between Europeans and colonized peoples; the global formation of capi-
tialism; struggles of indigenous peoples; and the constitu-
tion of bourgeois bodies and racial selves in modern societ-
yes. Offered in alternate years. GE credit: ArtHum | AH, VL, WC, WE.—II. [I] El Shakry

(change in existing course—fall 12)

110B. History of Jews in the Muslim World (4)

Lecture—3 hours; discussion or paper (student option). Political, cultural and intellectual study of the Greek world from Minoan-Mycenaean period to end of Hellenistic Age. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—II. Spyridakis

(change in existing course—fall 13)

111A. Ancient History (4)

Lecture—3 hours; discussion or paper (student option). History of ancient empires of the Near East and of their historical legacy to the Western world. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—I. Spyridakis

(change in existing course—fall 13)

111B. Ancient History (4)

Lecture—3 hours; discussion or paper (student option). Development of Rome from earliest times. Rise and fall of the Roman Republic; the Empire to 476 A.D. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—II. [III] Spyridakis

(change in existing course—spring 13)

111C. Ancient History (4)

Lecture—3 hours; discussion or paper (student option). History of Jews from the Biblical era to the era of Jewish emancipation. Topics can be framed chronologically (e.g., medieval Jewry) or thematically (e.g., trade and Jewish communities). May be repeated one time for credit. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

(change in existing course—fall 13)

112A. Topics in Pre-Modern Jewish History (4)

Lecture—3 hours; term paper. Topics in the history of Jews from the era of Jewish emancipation to the present. Topics can be framed chronologically or thematically (e.g., Zionism, assimilation, the post Holocaust Diaspora). May be repeated one time for credit. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

(change in existing course—spring 13)

112B. Topics in Modern Jewish History (4)

Lecture—3 hours; term paper. Topics in the history of Jews from the era of Jewish emancipation to the present. Topics can be framed chronologically or thematically (e.g., Zionism, assimilation, the post Holocaust Diaspora). May be repeated one time for credit. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

(change in existing course—fall 13)

112C. History of Jews in the Muslim World (4)

Lecture—3 hours; term paper. Prerequisite: upper division standing recommended. History of Jewish communities in the lands of Islam from the time of the Prophet Muhammad to the present day. GE credit: SocSci | SS, WC, WE.—I. [II] Miller

(change in existing course—fall 13)

113. History of Modern Israel (4)

Lecture—3 hours; term paper. Topics include the rise and fall of utopian Zionism, the century-long struggle between Jews and Arabs, the development of modern Hebrew culture, the conflict between religious and secular Jews, and the nature of Israel's multicultural society. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—II. Biale

(change in existing course—fall 13)

115A. History of West Africa (4)

Lecture—3 hours; term paper. Prerequisite: course 15 recommended. Introductory survey of the history of West Africa and/or the Congo region from the earliest times to the present. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

(change in existing course—winter 13)

115B. History of East and Central Africa (4)

Lecture—3 hours; term paper. Prerequisite: course 15 recommended. Introductory survey of the history of east and central Africa from earliest times to the present. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Decker

(change in existing course—fall 13)

115C. History of Southern Africa (4)

Lecture—3 hours; term paper. Prerequisite: course 15 recommended. History of the implementation, development, and legacy of Euro-

pean Colonialism in Africa. A comparison of British, Belgian, French, and Portuguese colonial efforts and impacts. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

(change in existing course—fall 13)

115D. History and Legacy of Colonialism in Africa (4)

Lecture—3 hours; term paper. Prerequisite: course 115A, 115B or 115C recommended. History of the history of the north and northeast regions of continental Africa (including South Africa) from ear-

liest times to the present. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Decker

(change in existing course—fall 13)

115E. The African Slave Trade (4)

Lecture—3 hours; writing—1 hour. History of the African Slave trades, from the early Egyptian and Saharan trades in the pre-modern period to the trans-Atlantic trade [15th-19th century] and the con-
temporary trafficking of humans. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—II. [III] Lawrance

(change in existing course—fall 13)

115F. History of North, Horn, Sudan and Nile Valley (North and North-East Africa) (4)

Lecture—4 hours; term paper. This course shall inves-
tigate the history of the north and northeast regions of continental Africa, encompassing the Medi-
terranean coast, Maghreb, Sahara, Horn of Africa, the Nile Valley and the Sudan, covering the ancient period to the present. May be repeated up to four units for credit when instructor differs. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—II. Miller

(change in existing course—fall 13)

116. African History: Special Themes (4)

Lecture—3 hours; term paper. Prerequisite: courses 115A and 115B recommended. Themes of African history, such as African states and empires, slave trade, relationships of Egypt to rest of Africa, Bantu origins and migrations, and French policy of Assimi-
lation and Association. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

(change in existing course—fall 13)

120. World War II (4)

Lecture—3 hours; extensive writing. The Second World War from 1931 to 1945 in all of its theaters. Causes, conduct, and consequences of the war including military, political, economic, social, and cultural factors, with special emphasis on battlefield strategies and home front. Offered irregularly. GE credit: SocSci | SS, WC, WE.—I, II, III, IV, [II, III, IV] Rachwuch

(change in existing course—fall 13)

121A. Medieval History (4)

Lecture/discussion and panel presentations—3 hours. European history from "the fall of the Roman Empire" to the eighth century. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—McKee

(change in existing course—winter 13)

121B. Medieval History (4)

Lecture/discussion and panel presentations—3 hours. European history from Charlemagne to the twelfth century. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—McKee

(change in existing course—winter 13)

121C. Medieval History (4)

Lecture/discussion and panel presentations—3 hours. European history from the Crusades to the Renaissance. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—II. McKee

(change in existing course—winter 13)

122. Selected Themes in Medieval History (4)

Laboratory/discussion—3 hours; term paper. Prereq-

uirement: course 45 recommended. Themes such as medieval agrarian history, feudalism, the family, medieval Italy, or the Crusades. Readings include original sources in English translation and modern works. May be repeated for credit. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

(change in existing course—fall 13)

125. Topics in Early Modern European History (4)

Laboratory/discussion—3 hours; term paper. Prereq-

uirements: course 45 recommended. European history from the 1300-1800. Topics such as medieval and Renaissance Italy, early modern Italy, Ancient Regime France, family and sexuality, and material culture and daily life. May be repeated for credit. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

(change in existing course—fall 13)

130A. Christianity and Culture in Europe: 50-1450 (4)

Lecture—3 hours; written report or research paper. A history of the ideas and institutions of Christianity and their impact on the late Roman Empire and medieval Europe in terms of outlook on life, art, poli-
tics and economics. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

(change in existing course—fall 13)

130B. Christianity and Culture in Europe: 1450-1600 (4)

Lecture—3 hours; written report or research paper. A history of the Lutheran, Zwinglian-Calvinist, Radic-
al, Anglican, and Catholic Reformations as founda-
tion stones of a new culture in Europe, with special attention to the interconnections between the revival of antiquity and the different reform movements. GE credit: ArtHum or SocSci | AH or SS, WC, WE.—Harris

(change in existing course—fall 13)

130C. Christianity and Culture in Europe: 1650-1850 (4)

Lecture—3 hours; written report or research paper. A survey of the intellectual, cultural and political orientation of European society in the aftermath of the Wars of Religion. "Secularization" will be dis-
cussed in the context of the Enlightenment and Romanticism. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

(change in existing course—fall 13)
131A. Early Modern European History (4)
Lecture—3 hours; written reports. Prerequisite: courses 4A and 4B recommended. Western European history from about 1350 to about 1500. GE credit: ArtHum or SocSci | AH or SS, WC, WE.—Stuart
(change in existing course—eff. winter 13)

131B. European History During the Renaissance and Reformation (4)
Lecture—3 hours; term paper. Survey of European society, politics, and culture from the late 15th through the early 17th centuries, with particular focus on the Italian and Northern Renaissance, the Protestant Reformation, and the Catholic Counter Reformation. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—Harri
(change in existing course—eff. winter 13)

131C. The Old Regime: Absolutism, Enlightenment and Revolution in Europe (4)
Lecture—3 hours; term paper. Survey of European society, politics, and culture in the 17th and 18th centuries, focusing on religious warfare, absolutism, Scientific Revolution, Enlightenment and the growth of religious tolerance, the French Revolution and the collapse of old order. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—Stuart
(change in existing course—eff. winter 13)

132. Crime and Punishment in Early Modern Europe (4)
Lecture—3 hours; term paper. Deviance and crime in early modern Europe, contrasting imaginary crimes, e.g. witchcraft, with "real" crimes such as highway robbery and imprisonment. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—Stuart
(change in existing course—eff. winter 13)

133. The Age of Ideas (4)
Lecture—3 hours; written reports. The Enlightenment and its background in the seventeenth century. GE credit: ArtHum or SocSci | AH or SS, WC, WE.—I. Stolzenberg
(change in existing course—eff. winter 13)

134A. The Age of Revolution (4)
Lecture—3 hours; written reports. Ideas and institutions during the French Revolution and the Napoleonic era. GE credit: ArtHum or SocSci | AH or SS, WC, WE.—J. Stolzenberg
(change in existing course—eff. winter 13)

135A. History of Science to the 18th Century (4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing. Emphasis on emergence of broad explanatory principles that serve more than one science. GE credit: ArtHum or SocSci | AH or SS, WC, WE.—Stolzenberg
(change in existing course—eff. winter 13)

135B. History of Science, 18th to 20th Centuries (4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing. Survey of the historical development of scientific thought in geology, biology, chemistry, physics and cosmology from the eighteenth to the twentieth century, with special emphasis on emergence of broad explanatory principles that serve more than one science. GE credit: ArtHum or SocSci | AH or SS, WC, WE.—Stolzenberg
(change in existing course—eff. winter 13)

136. Scientific Revolution (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 135A or 135B recommended. History of science in Western Europe (1400-1750). Investi-
148C. Women and Society in Europe: 1914-Present (4)
Lecture—3 hours; term paper. Prerequisite: course 148B recommended. The history of 20th-century Europe from the perspective of women and the family, and of sexual and gender relations. Emphasis on the impact of world events and movements, such as World War I, fascism, Soviet communism, World War II, the welfare state, feminism, and mass culture. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE. (change in existing course—eff. winter 13)

151A. England: The Middle Ages (4)
Lecture—3 hours; term paper. Prerequisite: course 4A recommended. Origins of England to the accession of the Lancastrians. Survey includes: impact of Norman Conquest on Anglo-Saxon institutions; rise of the Church, common law, parliament, and the economy; thought, arts, and literature to the age of Chaucer and Wycliff. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. (change in existing course—eff. winter 13)

151B. England: The Early Modern Centuries (4)
Lecture—3 hours; term paper. Prerequisite: courses 4A, 4B, course 151A recommended. From Lancaster and York to the Glorious Revolution. Includes growth of the Church of England; beginnings of modern world, rise of the centre of government; parliament; thought, arts, and literature in the times of More, Shakespeare, Hobbes, Wren, and Newton. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. (change in existing course—eff. winter 13)

151C. Eighteenth-Century England (4)
Lecture—3 hours; term paper. English history from the Glorious Revolution to the French Revolution. Examination of the transformation of one of Europe’s most politically unstable kingdoms into the firmly established constitutional monarchy which provided an environment to engender the industrial revolution. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. —Landau (change in existing course—eff. winter 13)

151D. Industrial England (4)
Lecture—3 hours; term paper. English history from Waterloo to the Battle of Britain; the rise and continuance of a first world power, examining the transformation of landed to class society, oligarchy to democracy and bureaucracy, Bentham to Bloomsbury, empire to commonwealth. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE. —Landau (change in existing course—eff. winter 13)

159. Women and Gender in Latin American History (4)
Lecture—3 hours; extensive writing. Prerequisite: one course either on Latin America or in women’s history in another world area. Roles of women and men in the history of Latin America, with an emphasis on the intersection of gender with racial and class categories. Introduction to the theoretical premises of women’s and gender history. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. —Landau (change in existing course—eff. winter 13)

160. Spain and America in the 16th Century (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. The Atlantic world in the 16th century, particularly the transcultural and reciprocal social and economic relations between Spain and America in the course of colonization. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE. —Harris (change in existing course—eff. winter 13)

162. History of the Andean Region (4)
Lecture/discussion—3 hours; written and/or oral reports. Historical background of the area that now comprises modern Peru, Bolivia, and Chile, from the beginning of human settlement to the present. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE. —II. (III.) C. F. Walker (change in existing course—eff. winter 13)

163A. History of Brazil (4)
Lecture—3 hours; written reports. The history of colonial and imperial Brazil from 1500 to 1889. GE credit: ArtHum or SocSci | AH or SS, WC, WE. (change in existing course—eff. winter 13)

163B. History of Brazil (4)
Lecture—3 hours; written reports. The history of the Brazilian republic from 1889 to the present. GE credit: ArtHum or SocSci | AH or SS, WC, WE. —I. Langland (change in existing course—eff. winter 13)

164. History of Chile (4)
Lecture—3 hours; term paper. Prerequisite: course 161A, 161B, 165, or 168 recommended. Emphasis on the history of Chilean political economy from 1930 to the present. Various strategies of development [modernization, clientelism, Neo-Liberalism]; the rise of mass politics; the course of foreign relations; and the richness of Chilean literature. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS, WC, WE. (change in existing course—eff. winter 13)

165. Latin American Social Reforms (4)
Lecture—3 hours; written reports. Major social upheavals since 1980 in selected Latin American nations; similarities and differences in cause, course, and consequence. GE credit: ArtHum or SocSci | AH or SS, WC, WE. (change in existing course—eff. winter 13)

166A. History of Mexico to 1848 (4)
Lecture/discussion—3 hours; written and/or oral reports. Political, economic, and social development of pre-Columbian, colonial and national Mexico to 1848. GE credit: ArtHum or SocSci | AH or SS, WC, WE. (change in existing course—eff. winter 13)

166B. History of Mexico Since 1848 (4)
Lecture/discussion—3 hours; written and/or oral reports. History of Mexico since 1848 to the present. GE credit: ArtHum or SocSci | AH or SS, WC, WE. (change in existing course—eff. winter 13)

167. Modern Latin American Cultural and Intellectual History (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Introduction to the cultural and intellectual history of Latin America including architecture, cinema, painting, music, and literature. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. —C. F. Walker, Reséndez (change in existing course—eff. winter 13)

168. History of Inter-American Relations (4)
Lecture—3 hours; written reports. Diplomatic history of Latin America since independence, intra-Latin American relations, relations with the United States, participation in international organizations, and communism in Latin America. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE. —II. C. F. Walker (change in existing course—eff. winter 13)

169A. Mexican-American History (4)
Lecture/discussion—3 hours; written and/or oral reports. Economics, politics, religious and political development of the Spanish-speaking population of the Southwestern United States from about 1800 to 1910. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE. —Oropeza (change in existing course—eff. winter 13)

169B. Mexican-American History (4)
Lecture/discussion—3 hours; written and/or oral reports. Role of the Mexican or Chicano in the economy, politics, religion, culture and society of the Southwestern United States since 1910. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE. —I. Oropeza (change in existing course—eff. winter 13)

170A. Colonial America (4)
Lecture—3 hours; term paper. Colonial society from 1607 to the American Revolution, with emphasis on European expansion, political, social and economic foundations, colonial thought and culture, and imperial rivalry. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, WE. —II. Smolenski, Taylor (change in existing course—eff. winter 13)

170B. The American Revolution (4)
Lecture—3 hours; term paper. Analysis of the Revolutionary epoch with emphasis on the structure of British colonial policy, the rise of revolutionary movement, the War for Independence and its consequences, and the Confederation Period. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, WE. —I. Langland (change in existing course—eff. winter 13)

170C. The Early National Period, 1789-1813 (4)
Lecture—3 hours; Political and social history of the American republic from the adoption of the Constitution through the War of 1812 and its consequences. GE credit: ArtHum or SocSci | ACGH, AH or SS, DD, WE. (change in existing course—eff. winter 13)

171A. Jacksonian America (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. The political and social history of the United States from the end of the War of 1812 to the Compromise of 1850. How the market revolution transformed American life, and led the nation towards war. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE. —Kelman (change in existing course—eff. winter 13)

171B. Civil War and Reconstruction (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Examination of the political and social history of the United States from the Compromise of 1850 to the end of Reconstruction in 1876. Causes of the war, the war itself, and the problems of reconstruction after the war. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE. —Kelman (change in existing course—eff. winter 13)

171BF. The Civil War in American Film (1)
Discussion—1 hour; film viewing. Prerequisite: course 171B concurrently. Viewing and discussion of films with short writing assignments. (P/NP grading only) GE credit: AH or SS. (change in existing course—eff. winter 13)

171D. Selected Themes in 19th Century American History (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Intercultural exchange, the single topic in the history of the United States in the 19th century. Sample topics include social history, the 1850s, and southern history. May be repeated one time for credit when topic differs. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, WE. (change in existing course—eff. winter 13)

172. American Environmental History (4)
Lecture—3 hours; term paper. Prerequisite: course 17A. Examination of changing relations between people and nature in the United States from pre-Columbian times to the present. Topics include ecological change; perceptions of nature;
social conflicts over “proper” uses of nature; environmental movements. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, WE.—II. Warren

(change in existing course—eff. winter 13)

173. Becoming an American: Immigration and American Culture (4)
Lecture—3 hours; term paper. Prerequisite: course 17B or 72B recommended. An introduction to the wide range of immigrant experiences and ideas of nativism that have shaped American culture in the twentieth century. From novels, memoirs and films, students will explore external and internal immigration and assimilation processes in modern U.S. society. Offered alternate years. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—I. Tsu

(change in existing course—eff. winter 13)

174A. The Gilded Age and Progressive Era: United States, 1876-1914 (4)
Lecture—3 hours; term paper. Prerequisite: course 17B. U.S. history and the construction of modern America from the end of Reconstruction to U.S. entry into World War I. Includes Southern redemption, Western incorporation, electoral corruption, labor movements, progressivism, women’s suffrage, U.S. imperial expansion, and immigration restriction. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, DD, WE.—II. Olmsted

(change in existing course—eff. winter 13)

174B. War, Prosperity, and Depression: United States, 1917-1945 (4)
Lecture—3 hours; term paper. Prerequisite: course 17B. America’s emergence as a world power, the business cycle of the 1920s, the New Deal and World War II. The United States’ role in such issues as government regulation of the economy, welfare capitalism, and class, racial, ethnic, and gender conflicts. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, DD, WE.—II. Olmsted, Rauchway

(change in existing course—eff. winter 13)

174C. The United States Since World War II, 1945 to the Present (4)
Lecture—3 hours; term paper. America’s struggle to respond to new complexities in foreign relations, social tensions, family changes and media. Emphasis on such topics as Cold War; anti-communism; crusade; civil rights, feminist and environmentalist movement; New Left; counterculture; Vietnam; Watergate, and the third world. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, DD, WE.—II. Olmsted, Oropesa

(change in existing course—eff. winter 13)

174D. Selected Themes in 20th Century American History (4)
Lecture—3 hours; term paper. Prerequisite: course 17B or the equivalent. Interpretive overview of a single topic in the history of the United States in the 20th century with attention to the phases and processes of historical change. May be repeated one time for credit when topic differs. Offered in alternate years. GE credit: ArtHum or SocSci | ACGH, AH or SS, WE.—II. Olmsted

(change in existing course—eff. winter 13)

175. American Intellectual History (4)
Lecture—3 hours; term paper. Prerequisite: course 17B and upper division standing. Ideas that have shaped politics and society in the United States from colonial times to the present. Topics include American liberalism, republicanism, democracy, constitutionalism, communitarianism, utopianism, pragmatism, feminism, Darwinism, nationalism, conservatism, and utopianism. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, WE.—Rauhway

(change in existing course—eff. winter 13)

176A. Cultural and Social History of the United States (4)
Lecture—3 hours; term paper. Study of social and cultural forces in American society in the nineteenth century with emphasis on social structure, work and leisure, socialization and the family, social reform movements, and American culture. GE credit: ArtHum or SocSci | ACGH, AH or SS, WE.—II. Hartigan-O’Connor

(change in existing course—eff. winter 13)

176B. Cultural and Social History of the United States (4)
Lecture—3 hours; term paper. Study of social and cultural forces in American society in the twentieth century with emphasis on social structure, work and leisure, socialization and the family, social reform movements and changes in cultural values. GE credit: ArtHum or SocSci | ACGH, AH or SS, DD, WE.

(change in existing course—eff. winter 13)

178A. Race in America, 1492-1865 (4)
Lecture—4 hours. Prerequisite: course 17A or 17B or course 177A or 177B. Racial formation during the Age of Discovery, the Colonial Period, Early National Period, and the Civil War. Not open for credit to students who have completed course 178. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE—I. E. C. Walker

(change in existing course—eff. winter 13)

179. Asian American History, 1850-Present (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing recommended. The historical experience of people of Asian ancestry in the United States from the mid-nineteenth century to the present. Migration, labor, community formation, race relations, women and gender, popular culture. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—Tsu

(change in existing course—eff. winter 13)

180A. American Political History, 1789-1896 (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Growth of American politics from the birth of the republic to the end of the nineteenth century. Development of political parties, the expansion of civil rights, the rise of political issues such as slavery shaped the political process. Not open for credit to students who have completed course 180A. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—Tsu

(change in existing course—eff. winter 13)

180B. American Political History, 1896-pref. (4)
Lecture—3 hours; term paper. Prerequisite: course 17B. Politics in the United States from 1896 to the present. Topics include race and partisan politics; communism and anti-communism; the New Deal and the centralization of government; and the rise of the imperial presidency. Not open for credit to students who have completed course 180A or 180C. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, WE.

(change in existing course—eff. winter 13)

180BN. American Political History, 1896-pref. (4)
Lecture—3 hours; term paper. Prerequisite: course 17B. Politics in the United States from 1896 to the present. Topics include race and partisan politics; communism and anti-communism; the New Deal and the centralization of government; and the rise of the imperial presidency. Not open for credit to students who have completed course 180A or 180C. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, WE.

(change in existing course—eff. winter 13)

181. Religion in American History to 1890 (4)
Lecture—3 hours; term paper. Prerequisite: course 17A. American religious history from colonization through the end of the 19th century. Topics include religious diversity in America; native American religion; Protestant evangelism; gender and religion; religion and bigotry; African American religion; religion in the Civil War; and religion’s response to modernization. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, WE.—Smolenksi

(change in existing course—eff. winter 13)

182. Gender and Justice in American History (4)
Lecture—discussion—3 hours; term paper. Prerequisite: upper-division standing recommended. Intersection of gender and law in North America from the colonial period through the 20th century. Topics include child custody, protective labor laws, regulation of sexuality. Analysis of legal change, trials, and cultural influences. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—Hartigan-O’Connor

(change in existing course—eff. winter 13)

183A. The Frontier Experience: Trans-Mississippi West (4)
Lecture—3 hours; written and/or oral reports. The fur trade, western exploration and transportation, the Oregon Country, the Mexican War, the Mormons, mining discovery, and the West during the Civil War. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, WE.—Taylor, Warren

(change in existing course—eff. winter 13)

183B. The Frontier Experience: Trans-Mississippi West (4)
Lecture—3 hours; written and/or oral reports. Spread of the mining kingdom, the range cattle industry, Indian-military affairs, settlement of the Great Plains and Rocky Mountain Regions and political organization of the West. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, WE.—I. Warren

(change in existing course—eff. winter 13)

184. History of Sexuality in America (4)
Lecture—3 hours; extensive writing. History of sexuality in America from pre-European through the late twentieth century. Topics include birth control, marriage, sexual violence, prostitution, inter-racial relations, heterosexuality and homosexuality, the feminist, gay, and lesbian liberation movements, AIDS, commercialization of sexuality. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—Materson

(change in existing course—eff. winter 13)

185A. History of Science in America (4)
Lecture—3 hours; research paper. Survey of the European background. Study of American scientific institutions, ideas, personal and social processes in science, and of relationships between society and science from colonial times to present. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.

(change in existing course—eff. winter 13)

185B. History of Technology in America (4)
Lecture—3 hours; research paper. Study of American technology; emphasis on interdisciplinary approach to historical understanding of technological change, creative processes, institutions, ideas, and relationships between technology and society from colonial times to present. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.

(change in existing course—eff. winter 13)

188. America in the 1960s (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Tumult and upheaval in American politics, culture, and society: 1961-1969. Civil rights, Vietnam, the draft and the anti-war movement; rock and roll and the counterculture; modern feminism; modern conservatism; student movements; urban unrest and insurrection. Offered irregularly. GE credit: SocSci | ACGH, DD, SS; WC, Writing Experience

(change in existing course—eff. winter 13)

189. California History (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. California history from the pre-colonial period to the present including dispossession of California's Indians, political economy of the Spanish and Mexican periods, Gold Rush effects, etc.
industrialization, Hollywood, water politics, World War II, Proposition 13, and the emergence of the Silicon Valley. Not open for credit to students who have completed two courses of 198A, 198B, 189C. GE credit: ArtHum or SocSci, Wrt I | ACGH, AH or SS, DD, WE.—III. Tsu, Warren

change in existing course—eff. winter 13

190D. Middle Eastern History IV: Safavids, Iran, 1500-1722 (4)
Lecture—3 hours; term paper. Middle Eastern history focusing on Safavid Empire (present-day Iran, Iraq, Afghanistan, up to Georgia), beginning with the origins of the dynasty as a powerful religious family, to the establishment of the Empire, focusing on Social, Religious, Economic, and Political History. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Anooshahr
change in existing course—eff. winter 13

191A. Classical China I (4)
Lecture—3 hours; term paper. History of Chinese civilization from its origins through the establishment of city states and the flowering of classical philosophy, to the rise and fall of the First Empire. GE credit: ArtHum or SocSci, Div, Wrt I | AH or SS, WC, WE.—change in existing course—eff. winter 13

191B. High Imperial China (4)
Lecture—3 hours; term paper. Political disunion and the influx of Buddhism and reunification under the great dynasties of T’ang, Sung, and Ming with analysis of society, culture and thought. GE credit: ArtHum or SocSci, Div, Wrt I | AH or SS, WC, WE.—I. Bossler
change in existing course—eff. winter 13

191C. Late Imperial China (4)
Lecture—2 hours; discussion—1 hour; two long papers. Prerequisite: course 9A or upper division standing. The decline and fall of the Chinese Empire, with particular attention to the social and political crises of the 19th century, and the response of government officials, and ordinary people to the increasing pressures of Western imperialism. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Bosler
change in existing course—eff. winter 13

191D. Nineteenth Century China: The Empire Confronts the West (4)
Lecture—2 hours; discussion—1 hour; term paper. Prerequisite: course 9A, or upper division standing. The decline and fall of the Chinese Empire, with particular attention to the social and political crises of the 19th century, and the response of government officials, and ordinary people to the increasing pressures of Western imperialism. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Bosler
change in existing course—eff. winter 13

191E. The Chinese Revolution (4)
Lecture—2 hours; discussion—1 hour; extensive writing. Prerequisite: upper division standing. Analysis of China’s cultural and political transformation from Confucian empire into Communist state. Emphasis on emergence and triumph of peasant revolutionary strategy (to 1949), with some attention to its implications for postrevolutionary culture and politics. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—II.
change in existing course—eff. winter 13

191F. History of the People’s Republic of China (4)
Lecture—2 hours; discussion—1 hour; extensive writing. Prerequisite: upper division standing. Comprehensive analysis of recent Chinese history, including land reform, the Cultural Revolution, the post-Mao era, and the consequences of the new economic policies of the 1980s. Not open for credit to students who have completed course 190C. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—change in existing course—eff. winter 13

193C. The Middle East Environment: Historical Change and Current Challenges (4)
Lecture/discussion—3 hours; project. Prerequisite: upper division standing recommended. Examines Middle East environment and human use of nature over last 10,000 years. Introduction to desert ecology, environmental history and current environmental problems. Case Studies of Egypt, Maghreb countries, Arabian peninsula/Saudi countries, desertification, water, indigenous knowledge, and national parks. GE credit: ArtHum or SocSci | AH or SS.—Davis
change in existing course—eff. fall 13

194A. Aristocratic and Feudal Japan (4)
Lecture—3 hours; term paper and/or discussion. Broad survey of the cultural, social, religious, and political aspects of Japanese history from the seventh century through the sixteenth centuries emphasizing comparison of the organizations, values, and beliefs associated with the aristocratic and feudal periods. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—change in existing course—eff. winter 13

194B. Early Modern Japan (4)
Lecture—3 hours; term paper and/or discussion. Survey of the cultural, social, economic, and political aspects of Japanese history from the seventeenth through the nineteenth centuries emphasizing the development of those patterns of thought and political organization with which Japan met the challenge of the nineteenth-century expansionism. GE credit: ArtHum or SocSci, Div | AH or SS, WC, WE.—Kim
change in existing course—eff. winter 13

194C. Modern Japan (4)
Lecture—3 hours; term paper and/or discussion. Survey of the cultural, social, economic, and political aspects of Japanese history in the twentieth century emphasizing movements, militarism and the Pacific war, and the emergence of Japan as a major economic power. GE credit: ArtHum or SocSci, Div | AH or SS, WC, WE.—I. Kim
change in existing course—eff. winter 13

194D. Business and Labor in Modern Japan (4)
Lecture—3 hours; term paper. Survey of labor and management relations in Japan from the mid-eighteenth century to the present. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS, WC, WE.
change in existing course—eff. winter 13

194E. Education and Technology in Modern Japan (4)
Lecture—3 hours; term papers. Survey of education and technology in Japan from the mid-eighteenth century to the present. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS, WC, WE.
change in existing course—eff. winter 13

195B. History of Modern Korea (4)
Lecture—3 hours; laboratory/discussion—1 hour. Prerequisite: upper division standing. History of Modern Korea, from Yi dynasty period to 1990s. Political and socioeconomic changes in the 19th century, modernization under Japanese colonialism, postwar economic growth and effects of the Cold War. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—I. Kim
change in existing course—eff. winter 13

196A. Medieval India (4)
Lecture—3 hours; discussion—1 hour; written report. Survey of history of India in the millennium preceding arrival of British in the eighteenth century, focusing on interaction of the civilizations of Hinduism and Islam and on the changing nature of the state. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—II. Sen
change in existing course—eff. winter 13

196B. Modern India (4)
Lecture—3 hours; discussion—1 hour; written reports. Survey of cultural, social, economic, and political aspects of South Asian history from arrival of the British in the eighteenth century to formation of new independent states—India, Bangladesh, and Pakistan—in the twentieth century. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—III. Sen
change in existing course—eff. winter 13

Human Development

New and changed courses in Human Development (HDE)

Lower Division

12. Human Sexuality (3)
Lecture—3 hours. Vocabulary, structure/function of reproductive system; sexual response; pre-natal development; pregnancy and childbirth; development of sexuality; rape and sexual assault; birth control; sexually transmitted diseases; homosexuality; establishing/maintaining intimacy; sexual dysfunctions; communication; enhancing sexual interaction, cultural differences in attitudes towards sexuality. GE credit: SocSci, Div | ACGH, DD, SS.—II. (III. I, II, III.)
change in existing course—eff. winter 13

Upper Division

103. Cross-Cultural Study of Children (4)
Lecture—4 hours. Prerequisite: course 100A or consent of instructor. Cross-cultural studies of children in developing countries and among minority groups in the U.S. GE credit: SocSci, Div | ACGH, DD, SS, WC.—I. (III.)
change in existing course—eff. winter 13

Human Rights

New and changed courses in Human Rights (HMR)

Lower Division

200A. History, Theory and Criticism of Human Rights (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Restricted to graduate students. Introduces the advanced study of Human Rights and the theoretical and practical elaboration of the international Human Rights system. Seminar will engage with criticism of Human Rights and develop research and teaching within disciplin ary and interdisciplinary frameworks. (Same course as Study of Religion 231E.) Offered in alternate years.—II. (III.) Waltenpaugh
new course—fall 13

200B. Memory, Culture, and Human Rights (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Restricted to graduate students. Explores the multiple convergences among memory, culture, and human rights. Discusses diverse approaches to how societal actors in different historical, cultural, and national settings,
Hydrology

New and changed courses in Hydrology (HYD)

Lower Division

10. Water, Power, Society (3)
Lecture—2 hours; discussion—1 hour. Water resources issues. How water has been used to gain and wield socio-political power. Water resources development in California as related to current and future sustainability of water quantity and quality. Rules of science and policy in solving water problems. [Same course as Science and Society 10.] GE credit: SciEng or SocSci, Wrt | SE or SS, SL.—III. (I.) Fogg

(change in existing course—eff. fall 11)

47. Watershed Processes and Water Quality in the Tahoe Basin (2)
Lecture/lab—21 hours; fieldwork—9 hours; discussion—3 hours; term paper. Prerequisite: Basic knowledge of environmental, soil, or hydrologic sciences. Watershed processes, runoff, water quality management, restoration in Lake Tahoe Basin. Soils, precipitation-runoff, revegetation and adaptive management related to erosion control, effective solutions, development of restoration strategies. Students develop field restoration course involves 3 days of instruction in Tahoe City. [Same course as Environmental Science and Management 47.] Not open to students who have successfully completed Environmental and Resource Sciences 47. GE credit: SciEng | QL, SL, VL.—IV. (I.) Grismer

(change in existing course—eff. winter 13)

Upper Division

103N. Fluid Mechanics Fundamentals (4)
Lecture—4 hours. Prerequisite: Physics 9B. Fluid mechanics axioms, fluid statics, kinematics, velocity fields for one-dimensional incompressible flow and boundary layers. Time-averaging, potential flow, dimensional analysis, and macroscopic balances to solve a range of practical problems. [Same course as Biological Systems Engineering 103.] GE credit: SciEng | QL, SE, VL.—II. (I.) Wallender

(change in existing course—eff. winter 13)

110. Irrigation Principles and Practices (3)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Physics 7A; Soil Science 100 recommended. General course for agricultural and engineering students dealing with soil and plant aspects of irrigation and drainage. Soil water principles including water movement, plant responses to irrigation regimes, water use by crops; also irrigation systems and water quality. Offered in alternate years. Not open for credit to students who have completed Water Science 110. GE credit: SciEng | SE, SL.—II. (I.) Goldhamer, Grattan

(change in existing course—eff. winter 13)

124. Plant-Water-Soil Relationships (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one upper division course in soil science, such as Soil Science 156. The upper division course in plant science or plant biology, such as Plant Biology 111, or consent of instructor. Principles of plant interactions with soil and atmospheric water environments and practical applications to crop management [e.g., irrigation] and plant eco-physiology (e.g., drought). Not open for credit to students who have completed Water Science 104. GE credit: SciEng | QL, SE, SL.—II. (I.) Shackel

(change in existing course—eff. winter 13)

Hydraulics

New and changed courses in Humanities (HUM)

Lower Division

1. Humanities Forum (2)
Lecture—2 hours. Reading and discussion of a work representative of a particular culture, historical period, or genre and significant for its ongoing cultural impact in the humanities, sciences, social sciences, technology, and popular arenas. Attention to provocative implications for contemporary society. May be repeated one time for credit if topic differs. GE credit: ArtHum | AH.

(change in existing course—eff. winter 13)

28. American Humanities Forum (4)
Lecture—3 hours; extensive writing. Introduction to humanities topics and methodologies; analysis of major figures, works, and genres in American art and literature, with emphasis on relationships between history, society, and culture. May be repeated one time for credit if topic differs. GE credit: ArtHum | ACGH, AH, WE.—I, II, III. (I, II, III)

(change in existing course—eff. fall 12)

3. Medicine and Humanities (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: completion of Subject A requirement. Evolution of the "medical arts" into the "science of medicine." The culture of medicine in the context of society, medical ethics. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.

(change in existing course—eff. winter 13)

9D. Don Quixote and the Modern World Discourse (2)
Discussion—2 hours. Prerequisite: course 9 concurrently. Small group discussions and preparation of short papers for course 9. Offered in alternate years. GE credit: ArtHum | AH, WE, VC.

(change in existing course—eff. winter 13)

15. Language and Identity (4)
Lecture/discussion—3 hours; extensive writing. Introduction to topics related to the construction of identity through language use, including geographical and social factors affecting language groups. Language ideology affecting linguistic groups, including bilinguals and non-native speakers of English. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE.

(change in existing course—eff. winter 13)

Upper Division

144. Marx, Nietzsche, Freud (4)
Lecture/discussion—3 hours; term paper. Study of major works of Marx, Nietzsche, and Freud, selected with an eye to their impact on 20th-century economics, ethics, and attitudes toward eros. Particular focus on conceptions of the self and the individual's relation to society. Offered in alternate years. [Same course as German 144.] GE credit: ArtHum, Wrt | AH, WE.—I.

(change in existing course—eff. fall 11)

134. Aqueous Geochemistry (6)
Lecture—4 hours; laboratory—3 hours. Prerequisite: Chemistry 2B; Chemistry of water; dielectric properties of water; thermodynamic and mass-action relations; metal hydrosol; acid-base equilibria; metal coordination chemistry; solubility calculations; electron-exchange reactions; sorptive partitioning; ion exchange; and dissolved organic matter. GE credit: SciEng | QL, SE.—III. (III.) Hennes, Parikh

(change in existing course—eff. winter 13)

141. Physical Hydrology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Physics 9B, Mathematics 21B; course 100 recommended. Introduction to the processes that constitute the hydrologic cycle. Special emphasis on a quantitative description of the following processes: precipitation, infiltration, evaporation, transpiration, surface runoff, and groundwater runoff. GE credit: SciEng | QL, SL, VL.—I. (I.) Puente

(change in existing course—eff. winter 13)

142. Systems Hydrology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 141 or Civil and Environmental Engineering 142. General course considering hydrologic processes from a systems and multidisciplinary perspective. General probability concepts are applied to frequency, time series and spatial data analysis. Linear systems are also considered in conjunction with Kalman filter techniques. GE credit: SciEng | QL, QL, SE.—II. (II.) Puente

(change in existing course—eff. winter 13)

143. Hydrological Processes in Ecosystems (3)
Lecture—3 hours. Prerequisite: course 141 or Environmental and Resource Science 100. Movement and storage of water are integral parts of landscape and ecosystem functioning. Hydrological processes in individual ecosystems and the role of water linking the myriad components of the landscape. GE credit: SciEng | QL, SE, SL.—II. (II.) Pasernack

(change in existing course—eff. winter 13)

144. Groundwater Hydrology (4)

(change in existing course—eff. winter 13)

146. Hydrogeology and Contaminant Transport (5)
Lecture—3 hours; laboratory—2 hours; term paper. Prerequisite: course 144 or Civil and Environmental Engineering 144 or the equivalent. Physical and chemical processes affecting groundwater flow and contaminant transport, with emphasis on realistic hydrogeologic examples. Groundwater geochemistry and chemistry. Fundamentals of groundwater flow and transport analysis. Laboratory includes field pumping test and work with physical and computer models. [Same course as Geology 156.] GE credit: SciEng | SE.—II. (II.) Fogg

(change in existing course—eff. winter 13)

147. Runoff, Erosion and Water Quality Management in the Tahoe Basin (3)
Lecture/lab—30 hours; fieldwork—15 hours; discussion—10 hours; term paper. Prerequisite: Physics 7B or 9B, Mathematics 16C or 21C, Civil and Environmental Engineering 142 or courses 141 or Environmental and Resource Sciences 100. 5 days of instruction in Tahoe City. Practical hydrology and runoff water management quality from Tahoe Basin slopes. Development of hillside and riparian
International Agricultural Development

New and changed courses in International Agricultural Development (IAD)

Upper Division

142. Equipment and Technology for Small Forms (2)
Lecture—1 hour; laboratory—3 hours. Types and characteristics of agricultural equipment and technologies appropriate for small commercial farming. Adjustment and calibration of equipment. Selection of and budgeting for equipment. (Same course as Applied Biological Systems Technology 142.) GE credit: SciEng | QL, SE, VL.—III. Shafii
[change in existing course—eff. winter 13]

160. Agroforestry: Global and Local Perspectives (3)
Lecture/discussion—3 hours. Prerequisite: Plant Sciences 2 or Biological Sciences 1C or 1C; Plant Sciences 142 or 150 or Biological Sciences 28 or a general ecology course. Traditional and evolving use of trees in agricultural ecosystems; their multiple roles in environmental stabilization and production of food, fiber, and fuel; and socioeconomic barriers to the adoption and implementation of agroforestry practices. Not open for credit to students who have taken previously an easily taken Agricultural Management and Rangeland Resources 160. [Former course Agri-cultural Management and Rangeland Resources 160.] (Same course as Plant Sciences 160.) Offered in alternate years. GE credit: SciEng | SE.—III. Gradziel
[change in existing course—eff. winter 13]

International Commercial Law (A Graduate Group)

New and changed courses in International Commercial Law (A Graduate Group) (ICL)

Graduate

201A. Fundamentals in United States Law (4)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Investigation of the Common Law System of the U.S. Includes the American constitutional system, the American judiciary, the American civil trial, and foundational substantive and procedural law such as real property, torts, criminal law and procedure, civil procedure, and contracts.—IV
[change in existing course—eff. summer 13]

201B. Advanced Topics in United States Law (3)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Orientation to advanced topics in U.S. law - Intellectual Property (including copyright and trademarks), Commercial and Consumer Law, Advanced Contracts, Antitrust, Taxation, Remedies, Labor Law, Environmental Law, Dispute Resolution, Remedies and introduction to trial techniques and legal research/writing.
[change in existing course—eff. summer 13]

202A. Introduction to Contracts Formation (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Examinations formation of the sorts of promises that are enforced and the nature of protection given promissory obligations in both commercial and noncommercial transactions. Inquiry is made into the means by which traditional doctrine adjusts to changing social demands. Offered irregularly.—II, IV. [II, IV]
[new course—eff. fall 13]

202B. Contracts Performance (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Principles, doctrines and controversies regarding the structure and division of powers in American government. Includes judicial review, jurisdiction, standing to sue, federalism, federal and state powers and immunities, and the separation of powers among branches of the federal government. Offered irregularly.—II, IV. [II, IV]
[new course—eff. summer 13]

205A. Overview of US Constitutional Law (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Principles, doctrines and controversies regarding the structure and division of powers in American government. Includes judicial review, jurisdiction, standing to sue, federalism, federal and state powers and immunities, and the separation of powers among branches of the federal government. Offered irregularly.—IV
[change in existing course—eff. fall 13]

205B. Constitutional Law—Protection of Individual Rights (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Principles, doctrines and controversies regarding the U.S. Constitution Bill of Rights, including due process of law, equal protection, freedom of expression, freedom of religion, state action, and congressional legislation in aid of civil rights and liberties.
[new course—eff. summer 13]

2125. Introduction to Negotiation (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Introduction to theoretical and empirical approaches to negotiation for the purposes of making deals and resolving legal disputes. Offered irregularly.—IV
[change in existing course—eff. fall 13]

228A. Mergers and Acquisitions Law (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Practical approach to mergers and acquisitions with an in-depth look at the planning, negotiation and completion of mergers and acquisitions. Offered irregularly.—IV
[change in existing course—eff. fall 13]

228AS. Mergers and Acquisitions Law (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Practical approach to mergers and acquisitions with an in-depth look at the planning, negotiation and completion of mergers and acquisitions. Offered irregularly.—IV
[change in existing course—eff. fall 13]
289. Licensing Academy in Intellectual Property & Technology (4)
Lecture/discussion—20 hours. Prerequisite: course 201. Law school education or equivalent. Intellectual property as it relates to current forms of legal protection and how new innovations fit into these models, including public/private technology transfer, patents, institutional objectives, technology transfer offices, startups, and licenses.

(new course—eff. summer 13)

291C. International Commercial Law Seminar (4)
Lecture—discussion—20 hours. Prerequisite: course 201. Law school education or equivalent. Advanced seminar in a current topic in International Commercial Law. Offered at the University of Cologne in Cologne, Germany for two weeks each summer. May be repeated three times for credit when topic differs.

(change in existing course—eff. summer 13)

292. International Commercial Law Seminar (1-4)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Advanced seminar in a current topic in International Commercial Law. Topic will change each year the course is offered. May be repeated two times for credit when topic differs. Offered irregularly.—II, IV.

(change in existing course—eff. summer 13)

292S. International Commercial Law Seminar (1-4)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Advanced seminar in a current topic in International Commercial Law. Topic will change each year the course is offered. May be repeated two times for credit when topic differs. Offered irregularly.—II, IV.

(new course—eff. spring 13)

International Relations

New and changed courses in International Relations (IRE)

Lower Division

1. Global Interdependence (4)
Lecture—3 hours; discussion—1 hour. Development of the concept of global interdependence along its political, economic, demographic, cultural, technological, and environmental dimensions. Focus on the ways societies and states interact. Course provides the foundation for upper division multidisciplinary work in international relations. GE credit: SocSci | SS, WE.—II, III, [I, II].

(change in existing course—eff. winter 13)

Upper Division

104. The Political Economy of International Migration (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: upper division standing. Analysis of worldwide migration patterns, and social scientific theories of international and transnational migration. Focus in economical, political, and social impact of immigration and potential for international and regional cooperation. (Same course as Sociology 104.) GE credit: SocSci | Qi, Sl, SS.

(change in existing course—eff. winter 13)

192. International Relations Internship (1-12)
Internship—3-36 hours (to be arranged). Prerequisite: upper division standing and consent of instructor. Work experience in international relations, with term paper summarizing the practical experience of the student. (P/NP grading only.) GE credit: SS, WE.

(change in existing course—eff. winter 13)

194HA-194HB. Special Study for Honors Students (4-4)
Seminar—2 hours; term paper. Prerequisite: open only to majors of senior standing who qualify for honors program. Directed reading, research, and writing by an instructor culminating in preparation of a senior honors thesis under direction of a faculty advisor. (Deferred grading only, pending completion of sequence.) GE credit: SocSci | Qi, SS, WE.—I, III, [I, II].

(change in existing course—eff. winter 13)

Italian

New and changed courses in Italian (ITA)

Lower Division

1. Elementary Italian (5)
Discussion—5 hours; laboratory—1 hour. Introduction to Italian grammar and development of all language skills in a cultural context with special emphasis on communication. Students who have successfully completed Italian 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student's P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed. Not open for credit to students who have taken course 1A or 1S. GE credit: ArthHum | AH, WE.—I, II, [I, II].

(change in existing course—eff. winter 14)

15. Elementary Italian (5)
Discussion—5 hours; laboratory—1 hour. Introduction to Italian grammar and development of all language skills in a cultural context with special emphasis on communication. Course is taught abroad. Students who have successfully completed Italian 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student's P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed. Not open for credit to students who have taken course 1 or 1A. GE credit: ArthHum | AH, WC.—I, II, [I, II].

(change in existing course—eff. winter 14)

2. Elementary Italian (5)
Discussion—5 hours; laboratory—1 hour. Prerequisite: course 1 or 1S. Continuation of course 1 or 1S. Review of grammar and vocabulary, and practice of all language skills through cultural texts. Not open for credit to students who have taken course 1 or 1A. GE credit: ArthHum | AH, WC.—I, II, [I, II].

(change in existing course—eff. winter 14)

25. Elementary Italian (5)
Discussion—5 hours; laboratory—1 hour. Prerequisite: course 1 or 1S. Continuation of course 1 or 1S. Review of grammar and vocabulary, and practice of all language skills through cultural texts. Course is taught abroad. Not open for credit to students who have taken course 1A or 1S. GE credit: ArthHum | AH, WC.—I, II, [I, II].

(change in existing course—eff. winter 14)

3. Elementary Italian (5)
Lecture/discussion—5 hours; laboratory—1 hour. Prerequisite: course 2 or 2S. Continuation of course 2 or 2S. Review of grammar and vocabulary, and practice of all language skills through cultural texts. Not open for credit to students who have taken course 1A or 1S. GE credit: ArthHum | AH, WC.—I, II, [I, II].

(change in existing course—eff. winter 14)

35. Elementary Italian (5)
Discussion—5 hours; laboratory—1 hour. Prerequisite: course 2 or 2S. Continuation of course 2 or 2S. Review of grammar and vocabulary, and practice of all language skills through cultural texts. Course is taught abroad. Not open for credit to students who have taken course 1A or 1S. GE credit: ArthHum | AH, WC.—I, II, [I, II].

(change in existing course—eff. winter 14)

Upper Division

101. Advanced Conversation, Composition, and Grammar (4)
Lecture—3 hours. Prerequisite: course 9 or consent of instructor. GE credit: ArthHum | AH, OL, WC, WE.—I, II, [I, II].

(change in existing course—eff. spring 13)

1015. Advanced Composition, Conversation and Grammar (4)
Lecture—3 hours; extensive writing. Prerequisite: course 9. Instruction and practice in expository writing in Italian, with emphasis on advanced grammar, organization, and vocabulary building. Course will be taught in Italy. Not open for credit to students who have completed course 101. GE credit: ArthHum | AH, OL, WC, WE.—I, II, [I, II].

(change in existing course—eff. winter 13)

1045. Translation and Style (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 101 or consent of instructor. Practice in translation from Italian to English and English to Italian, using literary and non-literary texts of different styles. Analysis of linguistic problems and elements of style contained in the translation material. GE credit: AH, WC.—I, II, [I, II].

(change in existing course—eff. winter 13)

107. Survey of Italian Culture and Institutions (4)
Lecture—3 hours; term paper. Assessment of the impact of regional autonomy on Italian cultural life from the Middle Ages to the present. Special emphasis will be placed upon achievements in literature, the arts, philosophy, and sociopolitical institutions. To be taught in English. GE credit: ArthHum or SocSci | AH, OL, SS, VL, WC, WE.—I, II, III.

(change in existing course—eff. winter 13)
1075. Survey of Italian Culture and Institutions (4)
Lecture/discussion—3 hours; term paper. An assessment of the impact of regional autonomy on Italian cultural life from the Middle Ages to the present. Special emphasis will be placed upon achievements in literature, the visual arts, music, and sociopolitical institutions. To be taught in English. Not open for credit to students who have completed course 107.
GE credit: ArtHum or SocSci | AH, OL, SS, VL, WC, WE.—III. (III.) Chang (change in existing course—eff. winter 13)

108. Contemporary Issues in Italian Culture and Society (4)
Lecture/discussion—3 hours; term paper. Analysis of cultural issues in contemporary Italy: Myth and reality of imagined Italies, Italian identities; immigration and race relations; the media and popular culture. Taught in English. GE credit: ArtHum or SocSci, Div, Wrt | AH, OL, SS, VL, WC, WE.—I. (I.) Bassi (change in existing course—eff. winter 13)

1085. Contemporary Issues in Italian Culture and Society (4)
Lecture/discussion—3 hours; term paper. Analysis of cultural issues in contemporary Italy: Myth and reality of imagined Italies, Italian identities; immigration and race relations; the media and popular culture. Taught in English. This course will be taught abroad. Not open for credit to students who have completed course 108. GE credit: ArtHum or SocSci, Div, Wrt | AH, OL, SS, VL, WC, WE.—III. (III.) (change in existing course—eff. winter 13)

120A. Italian Literature of the Twentieth Century: The Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Development of the novel from Svevo to the present. Emphasis on the work of Svevo, Levi, Moravia, Pasolini, and Vittorini. GE credit: ArtHum, Wrt | AH, WC, WE.—Cannon, Heyer-Caput (change in existing course—eff. fall 13)

141. Gender and Interpretation in the Renaissance (4)
Lecture/discussion—3 hours; term paper. Prerequisite: consent of instructor; at least one course in literature, or consent of instructor. Critical analysis of Renaissance texts with primary focus on issues such as: human dignity, education and gender politics; “high” and “low” culture and its relation to literary practices. (Same course as Comparative Literature 138.) GE credit: ArtHum, Div, Wrt | AH, WC, WE.—P/N grading only. GE credit: AH, WC.—III. (III.) Sorensen (change in existing course—eff. fall 11)

145. Special Topics in Italian Literature (4)
Lecture/discussion—4 hours. Prerequisite: course 9 or consent of instructor. Study of special topics and themes in Italian literature such as comic literature, epic poetry, pre-twentieth century theater, fascism, futurism, women and literature, and the image of America, etc. May be repeated for credit when topic differs. GE credit: ArtHum, Wrt | AH, OL, VL, WC, WE.—I., II., III. (I, II, III.) (change in existing course—eff. fall 11)

190X. Upper Division Seminar 1-2 Seminar—1-2 hours. Prerequisite: upper division standing and consent of instructor. Examination of a special topic in Italian language or culture through shared readings, discussions, written assignments or special activities such as film screening or laboratory work. Limited enrollment. May not be repeated for credit. GE credit: ArtHum | AH, WC, WE. (change in existing course—eff. winter 13)

194H. Special Study for Honors Students (3)
Independent study—3 hours. Prerequisite: open only to majors of senior standing who qualify for honors program. Guided research, under the direction of a faculty member, leading to a senior honors thesis on a topic in Italian literature, civilization, or language studies. [P/N grading only.] GE credit: AH, WC. (change in existing course—eff. winter 13)

195H. Honors Thesis (3)
Independent study—3 hours. Prerequisite: course 194H. Writing of an honors thesis on a topic in Italian literature, civilization, or language studies under the direction of a faculty member. [P/N grading only.] GE credit: AH, WC. (change in existing course—eff. winter 13)

Japanese
New and changed courses in Japanese (JPN)

Lower Division
75. Intensive Intermediate Japanese (20)
Lecture/discussion—20 hours. Prerequisite: course 2. Special intensive course that combines the work of courses 3, 4, 5, and 6. Introduction to Japanese grammar and development of all language skills in a cultural context with emphasis on communication. Taught in Japanese. This course may be repeated for credit when topic differs. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—I. (I.) Chang (change in existing course—eff. winter 13)

155. Introduction to Japanese Culture (2)
Lecture/discussion—2 hours, fieldwork—1 hour. Restricted to students enrolled in units for the Kyoto Quarter Abroad program. Aspects of Japanese culture: literature, history, religion, art, language, and society. Conducted in English; taught in Japan. [P/N grading only.] GE credit: AH, WC.—II. (II.) Sorensen (change in existing course—eff. winter 13)

98. Directed Group Study 1-5
[P/N grading only.] GE credit: AH. (change in existing course—eff. winter 13)

Upper Division
106. Japanese Culture Through Film (4)
Lecture/discussion—3 hours, film viewing—3 hours. Prerequisite: upper division standing or consent of instructor. Aspects of Japanese culture such as love, sexuality, war, the military, the family, the position of women, growing up and death as portrayed in Japanese cinema. Lectures, discussion, and readings in English. Films with English subtitles. GE credit: ArtHum, Div, Wrt | AH, VL, WC.—III. (III.) Gundry (change in existing course—eff. winter 13)

1175. Intensive Modern Japanese: Reading and Discussion (17)
Prerequisite: course 5. Intensive course combining the work of courses 6, 111, 112, and 113. Completes introduction to basic Japanese grammar. Develops more advanced reading, writing, listening, and conversational skills in a cultural context. Taught in Japanese. Not open to students who have taken courses 6, 111, 112, or 113. An exception can be made for students who have taken course 6 or its equivalent, provided that those five units are deducted from the 19 total unit load.—III. (III.) Gundry (change in existing course—eff. winter 14)

131. Readings in Modern Japanese Literature: 1920-1945 (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 113 or the equivalent. Fourth-year level reading of representative works of modern Japanese literature including short stories, novels, diaries, memoirs, poetry and excerpts from novels and plays from 1920 through the militaristic era, to the end of the war years in 1945. GE credit: ArtHum | AH.—III. (III.) Chang (change in existing course—eff. winter 13)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 113 or the equivalent. Continuation of course 131, but may be taken independently. Covers selected texts from the immediate postwar years beginning in 1945 down to 1970 and the post-war recovery. GE credit: ArtHum | AH.—III. (III.) Chang (change in existing course—eff. winter 13)

133. Readings in Modern Japanese Literature: 1970 to Present (4)
Lecture—3 hours; discussion—1 hour or term paper. Prerequisite: course 113 or the equivalent. Continuation of course 132, but may be taken independently. Covers selected texts from 1970 to the present. Offered in alternate years. GE credit: ArtHum | AH, WC.—II. (II.) Chang (change in existing course—eff. winter 13)

134. Readings in the Humanities: Traditional Culture (4)
Lecture—3 hours; discussion—1 hour or term paper. Prerequisite: course 113. Fourth-year level reading of modern works by major specialists on traditional Japanese culture: history, religion, thought, art, international relations, and literary history and criticism. Focus is equally on developing reading skills and learning about Japanese culture. GE credit: ArtHum | AH, WC.—II. (II.) Chang (change in existing course—eff. winter 13)

135. Readings in the Humanities: The Modern Period (4)
Lecture—3 hours; term paper. Prerequisite: course 113. Fourth-year level reading of authentic modern writings on Japanese culture, history, philosophy, society, religion, law, politics, international relations, aesthetics, and comparative culture by prominent critics, commentators, and scholars. GE credit: AH, WC.—III. (III.) Chang (change in existing course—eff. winter 13)

136. Readings in Newspapers and Magazines (4)
Lecture—3 hours, discussion—1 hour. Prerequisite: course 113 or the equivalent. Fourth-year level reading of newspaper and magazine reports, articles, and editorials on domestic and international affairs relating to contemporary Japan. Offered in alternate years. GE credit: ArtHum | AH, WC.—II. (II.) Chang (change in existing course—eff. winter 13)

151. Japanese Linguistics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1, 2, and 3 or equivalent. Introduction to Japanese linguistics, featuring key aspects of the Japanese language. Analysis of Japanese from the perspectives of phonology, syntax, discourse analysis, sociolinguistics and psycholinguistics. GE credit: ArtHum or SocSci | Div, Wrt | SS.—I. (I.) Chang (change in existing course—eff. winter 13)

198. Directed Group Study 1-5
[P/N grading only.] GE credit: AH, WC. (change in existing course—eff. winter 13)

199. Special Study for Advanced Undergraduates 1-5
[P/N grading only.] GE credit: AH, WC. (change in existing course—eff. winter 13)
Landscape Architecture

New and changed courses in Landscape Architecture (LDA)

1. Place, Culture and Community (4)
   Lecture—4 hours. Introduction to recognizing and reading cultural landscapes, and the application of cultural landscape meaning to the creation of contemporary built environments. Topics include patterns and influences relating to agriculture, military, transportation, housing, wilderness, recreation and tourism. GE credit: SocSci, Wrt | AH or SE or SS, VL, WC, WE.—II.—(I.) Owens (new course—fall 13)

21. Environmental Design Visualization (5)
   Lecture—3 hours; laboratory/discussion—3 hours. Prerequisite: course 1. Restricted to Landscape Architecture majors. Idea expression through graphic media and drawing techniques for visual representation of the built environment, including conventional drafting and expressive techniques. Introduction to computerized graphics techniques. GE credit: Architectural Foundation of the University of California, Div | AH, OL, VL.—II.—(I.) Owens (new course—fall 12)

30. History of Environmental Design (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Pass one restricted to Pre-Landscape Architecture and Landscape Architecture majors or consent of instructor. History of Environmental Design across disciplines including landscape architecture, planning, community and urban design. GE credit: Architectural Foundation of the University of California, Div | AH, OL, VL.—II.—(I.) Owens (new course—fall 12)

60. Landform and Grading Studio (6)
   Studio—8 hours; extensive problem solving. Prerequisite: course 1, 21, 30, 70. Restricted to Landscape Architecture majors. Introduction of landform and topography as landscape medium and utilization of grading and drainage to design meaningful and functional spaces. Introduction to site analysis, site planning, and the construction of design & drainage, including contour manipulation and physical model building. GE credit: Architectural Foundation of the University of California, Div | AH, OL, VL.—II.—(I.) Napavon (change in existing course—fall 12)

140. Green Building, Design, and Materials (4)
   Lecture—2 hours; laboratory—4 hours. Prerequisite: course 21, 30, 50, 70. Restricted to Landscape Architecture majors only. Sustainable design and construction techniques used in building scales. Emphasizes real-world case studies, analysis of opportunities for actual sites, and application of LEED and Sustainable SITES green rating systems. GE credit: Architectural Foundation of the University of California, Div | AH, OL, VL.—II.—(I.) Owens (new course—winter 13)

141. Community Design & Planning (6)
   Seminar—4 hours; term paper. Prerequisite: course 170, 171, 172, 180. Restricted to Landscape Architecture majors with consent to pursue senior thesis project in the following quarter. Research, design, and planning methods employed in landscape architecture. Exercises allow students to design independent landscape research. Lectures provide a historical overview of research methodology. GE credit: Architectural Foundation of the University of California, Div | AH, OL, VL.—II.—(I.) Owens (new course—winter 13)

150. Introduction to Geographic Information Systems (4)
   Lecture—3 hours; laboratory—3 hours. Prerequisite: course 3, 21, 30, 50, 70, 140, 141. Open to Sustainable Environmental Design Majors or by permission of instructor. Capture, modeling and analysis of geographical and environmental data. student teams will develop detailed proposals for real-world sites. GE credit: Architectural Foundation of the University of California, Div | AH or SE or SS, VL, WE.—III.—(I.II.) Owens (new course—spring 14)

180F. Special Topics in Landscape Architecture: Landscape Ecology (2)
   Lecture—2 hours. Prerequisite: course 50 or an introductory course in Ecology. Theories, major concepts and research methods of landscape ecology. Spatial structure, function and dynamics of various landscape types. Biological conservation, ecological restoration, and landscape planning, design, and management. Not open for credit to students who have taken Landscape Architecture 183. Offered in alternate years. GE credit: SciEng | SE, VL.—II.—(I., III.) Greco (new course—fall 13)

180G. Special Topics in Landscape Architecture: Regional Land Planning (2)
   Lecture—2 hours. Prerequisite: upper division standing. Theories, laws, and practices of community planning. Creation of livable and sustainable communities at various spatial scales. Smart growth in urbanism, neo-traditional town planning, transit-oriented, and sustainable communities. Traditional mas-
Latin

New and changed courses in Latin (LAT)

Lower Division

1. Elementary Latin (5)
   Lecture—5 hours. Introduction to basic grammar and vocabulary and development of translation skills with emphasis on Latin to English. (Students who have successfully completed Latin 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only.)

Although a passing grade will be charged to the student's P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed.) GE credit: ArtHum | AH.—I. (I.) Popescu, Rundin (change in existing course—eff. winter 13)

2. Elementary Latin (5)
   Lecture—5 hours. Prerequisite: course 1. Continuation of course 1. GE credit: ArtHum | AH.—II. (II.) Rundin (change in existing course—eff. winter 13)

3. Intermediate Latin (5)
   Lecture—5 hours. Prerequisite: course 2. Continuation of course 2. Selected readings from Latin authors. GE credit: ArtHum | AH, WC, WE.—Seal (change in existing course—eff. winter 13)

Upper Division

118. Roman Historians (4)
   Lecture/discussion—3 hours, term paper. Prerequisite: course 100 or equivalent. Readings in Latin from one or more of the major Roman historians and biographers. Authors may include Sallust, Nepos, Livy, Tacitus, Suetonius, and Ammianus Marcellinus. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—Seal (change in existing course—eff. winter 13)

119. Readings in Republican Latin Literature (4)
   Lecture/discussion—3 hours, term paper. Prerequisite: course 100 or equivalent. Translation and discussion of selected readings from Republican Latin literature. May be repeated for credit when topics vary. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—Seal (change in existing course—eff. summer 12)

120. Readings in Imperial Latin Literature (4)
   Lecture/discussion—3 hours, term paper. Prerequisite: course 100 or equivalent. Readings in Imperial Latin literature. May be repeated two times for credit when topics differ. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—Stem (change in existing course—eff. winter 14)

121. Latin Prose Composition (4)
   Lecture—3 hours; term paper. Prerequisite: course 100 or equivalent. Prose composition. Offered in alternate years. GE credit: ArtHum | AH (change in existing course—eff. winter 13)

130. Readings in Late Latin (4)
   Lecture/discussion—3 hours; term paper. Prerequisite: course 100 or equivalent. Translation and discussion of selected readings from late imperial-early medieval Christian and pagan literature. Offered in alternate years. GE credit: ArtHum | AH, WC, WE. (change in existing course—eff. winter 13)

Law

New and changed courses in Law (LAW)

Graduate

209AT. Patent Prosecution and Practice (2)
   Discussion—2 hours. Prerequisite: course 274 or consent of instructor. Essential aspects of patent prosecution: the role of the patent-practitioner, claims and specification drafting, requirements, and strategy, appeals and post-grant proceedings, American Invents Act considerations, portfolio development and strategy, and litigation considerations. (change in existing course—eff. spring 13)

213T. Terrorism and International Law (2)
   Seminar—2 hours. Terrorism is a pressing concern. Devising effective remedies for responding to it within the bounds of the law is critical. Therefore, the new generation of international lawyers needs to be familiar with the relevant law and standards. (new course—eff. fall 13)

218B. Law of War (3)
   Discussion—3 hours. Surveys the law of armed conflict as it applies to today's battlefields. (new course—eff. fall 13)

219. Evidence (3)
   Discussion—3 hours. Covers rules regarding the admissibility of testimonial and documentary proof during the trial of civil and criminal cases, including rules governing relevancy, hearsay, the examination and impeachment of witnesses, expert opinion, and constitutional and statutory privileges. (change in existing course—eff. fall 13)

220. State and Local Taxation (3)
   Discussion—3 hours. Introduction to fundamentals of state and local taxation. Beginning with historical and constitutional aspects, students will analyze recent developments in state and local taxation and their impact on client representation. (change in existing course—eff. fall 13)

221. Trusts, Wills and Dedicents' Estates (3)
   Discussion—3 hours. Law of decedent's estates, wills and trusts. (change in existing course—eff. fall 13)

222. Critical Race Theory Seminar (3)
   Discussion—3 hours. Examines race relations and racial discrimination in America through the perspectives of proponents of the Critical Race Theory (CRT) movement, a collection of legal scholars who challenge both conservative and liberal political orthodoxies. (change in existing course—eff. spring 13)

224. Animal Law Seminar (2)
   Seminar—2 hours. An introduction to legal principles affecting animals and their use. GE credit: WE. (change in existing course—eff. fall 13)

243A. Secured Transactions (2)
   Discussion—2 hours. Secured transactions are transactions where a lender takes an interest in debtor’s property as “collateral,” or security, for repayment of a loan. Covers secured transactions in personal property such as auto and bank loans against business inventory. (change in existing course—eff. fall 13)

248B. International Human Rights (2)
   Discussion—2 hours. Introduces international human rights legal system through an examination of its historical origins and precursors and a review of its international legal backdrop, including the character and sources of international law, the UN Charter and the UN system. (change in existing course—eff. fall 13)

250BT. Writing Requirement Workshop (2)
   Seminar—2 hours. Students who have written a course paper or an independent study paper and would like to take papers to the next level, producing a work of publishable quality. (S/U grading only.) GE credit: WE. (new course—eff. fall 13)

254T. Practicum in Rural Community Advocacy (3)
   Seminar—3 hours. Provides an opportunity to learn about Participatory Action Research (PAR) methods and community-based lawyering in the context of
rural community development and advocacy. Using these skills and knowledge to serve rural California communities. (change in existing course—eff. spring 13)

257B. Statutory Interpretation (3)
Discussion—3 hours. Elective course for Environmental Law Certificate Program. Provides an introduction to the theory and practice of statutory interpretation. (change in existing course—eff. fall 12)

264A. Ocean and Coastal Law (2)
Discussion—2 hours. Introduction to the goals and challenges of coastal and ocean policy; the complicated web of public and private interests in coastal lands and ocean waters; regulation of coastal development; domestic and international fisheries management; and preservation of ocean resources. (change in existing course—eff. spring 13)

269AT. The Financial Crisis: Law & Policy and Inequality (2)
Seminar—2 hours. Examines the regulation of financial intermediaries. The stated goal of regulation is to ensure systemic stability and to pursue consumer protection. We will ask whether there is an imbalance between systemic stability and consumer protection before the crisis of 2008. (new course—eff. spring 13)

274BT. Law of Trade Secrets and Restrictive Covenants (2)
Discussion—2 hours. Focus is on the law of trade secrets, including the Uniform Trade Secret Act (UTSA), restrictive covenants not to compete, and current case law developments in the areas of employee mobility and raids, and corporate espionage. (change in existing course—eff. fall 13)

274CT. Knowledge Commons, Collaborative Authorship, Open Access (2)
Seminar—2 hours. Focuses on the increasingly global diffusion and success of collaborative forms of cultural and technoscientific production rooted in copyright-based licenses. (new course—eff. spring 13)

275. Complex Litigation (2)
Discussion—2 hours. Issues that frequently arise in large complex litigation involving multiple parties and multiple claims. (change in existing course—eff. spring 13)

277. Native American Law (3)
Discussion—3 hours. Seminar focuses on legal relations between Native American tribes and the federal and state governments. (change in existing course—eff. fall 13)

280. Advanced Legal Writing: Analytical & Persuasive Writing (2)
Seminar—2 hours. Prerequisite: consent of instructor. Develop essay writing skills and performance test drafting typically employed on the bar examination. (S/U grading only.) (change in existing course—eff. fall 13)

280AT. Legal Analysis (2)
Discussion—2 hours. Selected enrollment by permission of professor; 20’s only. Focuses on skills critical to law school success, and ultimately, bar exam success. (S/U grading only.) (new course—eff. fall 13)

284. Law and Economics (4)
Discussion—4 hours. Prerequisite: study of economics is not required. Introduces students to the economic analysis of law. (change in existing course—eff. fall 13)

285. Environmental Law (3)
Discussion—3 hours. An introduction to federal and state environmental law, including coverage of historical development of environmental law; the role of courts. (change in existing course—eff. fall 13)

285TA. Environmental Law Seminar: Emerging Technologies and the Environment (2)
Seminar—2 hours. Examines legal regimes that might apply to various emerging technologies and consider governance mechanisms and reforms that might enable more foresighted and participatory development and management of technology. (change in existing course—eff. fall 13)

286. Health Care Law (3)
Discussion—3 hours. Addresses legal issues raised in general areas of health care and health care financing. Course materials and discussion focus on both public and private aspects of these issue areas. GE credit: WE. (change in existing course—eff. fall 13)

293AT. Contemporary Issues in Economic Justice (2)
Discussion—2 hours. Provides an introduction to the social justice critique of free markets. (new course—eff. spring 13)

Professional

414A. Negotiations Board (1)
Variable—1 hour. Prerequisite: consent of instructor. Members of the King Hall Negotiations Board assist in the administration of the King Hall Negotiation Team by performing a variety of tasks under the supervision of the course instructor. One unit of credit for each semester of service on the board, up to a maximum of two units per academic year. Credit is awarded only after approval by the instructor. (P/NP grading only.) (new course—eff. fall 12)

430. Federal and State Taxation Externship (2-6)
Clinical activity—2-12 hours. Prerequisite: course 220. Students will have the opportunity to work with the Internal Revenue Service or other governmental tax agency. Journals and attendance at group meetings are required. (S/U grading only.) (change in existing course—eff. fall 13)

440. Immigration Law Clinic (2-12)
(new course—eff. fall 13)

440A. Immigration Law Clinic (4)
Clinical Activity—8 hours. Prerequisite: Prior or concurrent enrollment in course 292. Each student is required to enroll for two semesters, receiving four units each semester for total of eight units. Provides legal representation to indigent non-citizens in removal proceedings before U.S. Immigration Courts, the Board of Immigration Appeals, and federal courts, including the Ninth Circuit Court of Appeals. (S/U grading only; deferred grading only, pending completion of sequence.) (change in existing course—eff. fall 13)

440B. Immigration Law Clinic (4)
Clinical Activity—8 hours. Prerequisite: Prior or concurrent enrollment in course 292. Each student is required to enroll for two semesters, receiving four units each semester for total of eight units. Provides legal representation to indigent non-citizens in removal proceedings before U.S. Immigration Courts, the Board of Immigration Appeals, and federal courts, including the Ninth Circuit Court of Appeals. (S/U grading only; deferred grading only, pending completion of sequence.) (change in existing course—eff. fall 13)

485. California Supreme Court Clinic (6)
Clinical activity—6 hours. Class size limited to 6 students. California Supreme Court Clinic provides students with an immersive experience in litigating cases before the state’s highest court. (change in existing course—eff. fall 13)

498. Group Study (1-4)
Prerequisite: consent of instructor. Groups of students with common interest in studying a stated legal problem may plan and conduct their own research and seminar program under the direction of faculty. Class size limited to no fewer than 4 or more than 10 students. (S/U grading only.) (change in existing course—eff. fall 12)

498A. Group Study (1-4)
Prerequisite: consent of instructor. Groups of students with common interest in studying a stated legal problem may plan and conduct their own research and seminar program under the direction of faculty. (new course—eff. fall 12)

Linguistics

New and changed courses in Linguistics (LIN)

Lower Division

5. Global English and Communication (4)
Lecture—2 hours; discussion—2 hours. English as a global language and its uses in intercultural communication. Cultural, historical, and political dimensions of varieties of English spoken around the world. Experiential grounding in strategies for increasing interpretive and verbal communicative competence for a globalized world. (Same course as Communication 5.) GE credit: ArtHum or SocSci | AH or SS, OL WC. —II. [8] Farrell, Feng, Ramanathan (change in existing course—eff. winter 13)

21. Introduction to Reading and Composition for Non-Native Speakers (5)
(canceled course—eff. winter 14)

22. Intermediate Reading and Writing for Non-Native Speakers (4)
(canceled course—eff. winter 14)

23. Advanced Reading and Composition for Non-Native Speakers (4)
(canceled course—eff. winter 14)

Upper Division

103A. Linguistic Analysis I: Phonetics, Phonology, Morphology (4)
Lecture—4 hours; discussion—1 hour. Prerequisite: course 1. Introduction to fundamental methods and concepts used in linguistic analysis, focusing on phonetic, phonological, and morphological phenomena. Emphasizes development of analytical skills and appreciation of structural regularities and differences among languages. Not open for credit to students who have completed course 139. GE credit: ArtHum | AH.—II. Farrell, Ogun (change in existing course—eff. winter 13)

103B. Linguistic Analysis II: Morphology, Syntax, Semantics (4)
Lecture—4 hours; discussion—1 hour. Prerequisite: course 1. Introduction to fundamental methods and concepts used in linguistic analysis, focusing on morphological, syntactic, and semantic phenomena. Emphasizes development of analytical skills and appreciation of structural regularities and differences among languages. Not open for credit to students who have completed course 140. 103B GE credit: ArtHum | AH.—II. Aranovich (change in existing course—eff. winter 13)
106. English Grammar (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or English 1 or University Writing Program 1 or consent of instructor. Survey of present-day English grammar as informed by contemporary linguistic theories. The major syntactic structures of English, their variation across dialects, styles, and registers, their development, and their usefulness in describing the conventions of English. (Same course as English 106.) Not open for credit to students who have taken course 104. GE credit: ArtHum | AH, WE.—I. (I.)
(change in existing course—eff. fall 11)

111. Introduction to Phonological Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 103A. Contemporary phonological theory with emphasis on syllable structure, metrical structure, phonology-phonology interaction, and typological variation in these areas, from the perspective of optimality-theoretic approaches. GE credit: ArtHum | AH.—II. Orgun
(change in existing course—eff. winter 13)

112. Phonetics (4)
Lecture—3 hours; term paper. Prerequisite: course 1. Detailed examination of articulatory and acoustic phonetics. GE credit: SciEng | SE.—I. Orgun
(change in existing course—eff. winter 13)

121. Morphology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 103A, 103B. Introduction to the analysis of word structure and the relation of word structure to the lexicon and other grammatical components. GE credit: ArtHum | AH.—III. Aranovich
(change in existing course—eff. winter 13)

141. Semantics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 103A. Analysis of the lexicon and other grammatical components. GE credit: ArtHum | AH.—II. Ojeda
(change in existing course—eff. winter 13)

151. Historical Linguistics (4)
Lecture—1 hour; discussion—1 hour. Prerequisite: course 103B. The linguistic study of meanings of words and phrases. Meanings expressed by lexical items and derivational and inflectional morphology. Contribution of argument structure, quantification, and coordination to meaning. GE credit: ArtHum, Wrt | AH.—I. Ojeda
(change in existing course—eff. winter 13)

152. Language Universals and Typology (4)
Lecture—3 hours; term paper. Prerequisite: course 103B. Investigation into common features of all human languages and the classification of languages in terms of their structural features. Theories of universal grammar. Detailed discussion of non-Indo-European languages and comparison with English. GE credit: ArtHum, Wrt | AH.—III. Farrell, Hawkins
(change in existing course—eff. winter 13)

165. Introduction to Applied Linguistics (4)
Lecture—3 hours; discussion—1 hour. Applications of linguistic principles and the analysis of language-related issues in the world. Exploration of a range of language-related problems including issues related to language learning and teaching to issues concerning language and gender, race, class and the media. GE credit: SocSci | SS, WE.—III. Ramana
(change in existing course—eff. winter 13)

166. The Spanish Language in the United States (4)
Lecture—3 hours; term paper. Prerequisite: course 1 or Spanish 111N; or Spanish 23 or the equivalent. Linguistic features of the varieties of the Spanish language spoken throughout the United States; phonology, morphology, syntax, vocabulary. Focus on the relationship between United States Spanish and other world varieties of Spanish, within a historical framework. GE credit: SocSci, Div, Wrt | SS.
(change in existing course—eff. winter 13)

173. Language Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or consent of instructor; courses 103A, 103B. Theory and research on children’s acquisition of their native language, including the sound system, grammatical systems, and basic semantic categories. (Same course as Education 173.) GE credit: SocSci | SS.—II. Uchánek
(change in existing course—eff. winter 13)

177. Computational Linguistics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or consent of instructor. Understanding the nature of language through computer modeling of linguistic abilities. Relationships between human cognition and computer representations of cognitive processing. Not open for credit to students who have completed course 7. GE credit: SciEng or SocSci | SS or WE.—II. Ojeda
(change in existing course—eff. winter 13)

180. Second Language Learning and Teaching (4)
Lecture/discussion—4 hours. Prerequisite: course 1 or equivalent. Psycholinguistic and sociolinguistic theories of second language learning. Connections between theoretical perspectives and pedagogical practices in formal and informal second language settings, with focus on teaching practices. GE credit: ArtHum, Wrt | AH.—I. Ojeda
(change in existing course—eff. fall 13)

Professional

300. Language Pedagogy (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing in Linguistics or consent of instructor; concurrent enrollment in course 297T recommended. Methods of teaching second languages to nonnative speakers, stressing particularly recent linguistic methodology and techniques, as related to teaching and tutoring in the UCLA EFL program. GE credit: ArtHum, Wrt | AH.—I. Menard-Warwick
(change in existing course—eff. fall 13)

11A. Elementary Accounting (4)
Lecture—3 hours; discussion—1 hour. Basic concepts of accounting; interpreting and using financial statements; understanding accounting principles. GE credit: SocSci | SS.—II. (II)
(change in existing course—eff. spring 14)
ple who rely on corporate governance in making investment decisions. (S/U grading only)—I, II, III, IV. (V) (new course—eff. winter 14)

411. Turnaround Management (1)
Lecture/discussion—1 hour. Evaluate the financial performance of a company, identify opportunities for improvement, propose real solutions to enhance performance, and most important inspire action in staff. (S/U grading only)—I, II, III, IV. (new course—eff. spring 13)

412. International Marketing (1)
Lecture/discussion—1 hour. Understanding basic concepts of international marketing. Understanding and managing heterogeneous, dynamic, and interdependent environments across countries. How to develop and implement an international marketing strategy: where and how to compete, how to adapt to your marketing mix.—II. (II.) Peters (new course—eff. winter 13)

413. Sustainable Business Ventures: Business and Energy (1)
Lecture/discussion—1 hour. Introduction to sustainability concepts, indicators, measurement techniques, and practice how it applies to large and small enterprise.—II. (II.) Jaffe (new course—eff. spring 13)

414. Multi-Channel Marketing (1)
Lecture/discussion—1 hour. Multi-channel marketing strategies empower managers to create value for different customer segments. Covers the necessary concepts to evaluate and select go-to-market strategies in order to capitalize on the ubiquity of modern customers. (S/U grading only)—II. (II.) Kubel (new course—eff. winter 13)

415. Climate Risks and Opportunities (1)
Lecture/discussion—1 hour. Provide a working knowledge of the risks and opportunities arising from climate change and climate policy for businesses.—IV. (IV.) Mazzucato (new course—eff. spring 13)

416. Topics in Private Equity (1)
Lecture—1 hour. Prerequisite: course 205. Restricted to students in the MBA program. Focuses on the science principles related to the risk and return of the private equity (PE) industry, including valuation of PE-targeted companies, the structuring of leveraged buyouts (LBOs), and the management of portfolio companies. (S/U grading only)—II. (II.) Yasuda (new course—fall 13)

440. Integrated Management Project (3)
Project—3 hours. Prerequisite: first-year core courses of M.B.A. program. Applies classroom learning to solve complex business challenges for real world clients. Students learn practical consulting skills while their clients benefit from the student’s experience, insights, and work product.—III, IV. (III, IV.) (new course—eff. spring 13)

440A. Integrated Management Project (3)
Lecture/discussion—3 hours. Prerequisite: first-year core courses of M.B.A. program. Restricted to full-time (day) MBA students. Applies classroom learning to solve complex business challenges for real world clients. Students learn practical consulting skills while their clients benefit from the student’s experience, insights, and work product. (Deferred grading only, pending completion of sequence).—I. (I.) (new course—eff. fall 12)

440B. Integrated Management Project (3)
Project—3 hours. Prerequisite: first-year core courses of MBA program. Restricted to full-time (day) MBA students. Applies classroom learning to solve complex business challenges for real world clients. Students learn practical consulting skills while their clients benefit from the student’s experience, insights, and work product. (Deferred grading only, pending completion of sequence).—I. (I.) (new course—eff. spring 13)

490. Directed Group Study Management Practicum (3)
Lecture/discussion—3 hours. Prerequisite: consent of instructor; sponsorship of a GSM Academic Senate faculty member; approval of graduate advisor. Provides opportunity for students to gain experience in applying business methodologies previously acquired in other GSM courses. May be repeated for credit. Offered irregularly.—IV. (IV.) (change in existing course—eff. summer 12)

498. Directed Group Study Management Practicum (1-12)
Project. Prerequisite: consent of instructor; sponsorship of a GSM Academic Senate faculty member, and approval of Graduate Adviser. Provides the opportunity for students to gain experience in applying business methodologies previously acquired in other GSM courses. (S/U grading only)—I, II, III, IV. (I, II, III, IV.) (change in existing course—eff. winter 12)

Mathematics

New and changed courses in Mathematics (MAT)

Lower Division
12. Precalculus (3)
Lecture—3 hours. Prerequisite: two years of high school algebra, plane geometry, plane trigonometry; and obtaining required score on the Precalculus Diagnostic Examination. Topics selected for their use in calculus, including functions and their graphs, slope, zeroes of polynomials, exponential, logarithmic and trigonometric functions, sketching surfaces and solids. Not open for credit to students who have completed any of courses 16A, 16B, 16C, 17A, 17B, 17C, 21A, 21B, or 21C with a C- or better. GE credit: SciEng | QL, SE.—II, III, (II, III.) (change in existing course—eff. winter 13)

21AL. Emerging Scholars Program Calculus Workshop (2)
Workshop—6 hours. Prerequisite: concurrent enrollment in course 21A. Functions, limits, continuity. Slope and derivative. Same course content as course 21A. Enrollment for students in the Emerging Scholars Program by instructor’s invitation only. Offered irregularly. (P/NP grading only) GE credit: SE.—(change in existing course—eff. winter 13)

21BL. Emerging Scholars Program Calculus Workshop (2)
Workshop—6 hours. Prerequisite: course 21A or 21A; concurrent enrollment in 21B. Continuation of course 21A. Same course content as 21B. Enrollment for students in the Emerging Scholars Program by instructor’s invitation only. Offered irregularly. (P/NP grading only) GE credit: SE.— (change in existing course—eff. winter 13)

21CL. Emerging Scholars Program Calculus Workshop (2)
Workshop—6 hours. Prerequisite: course 21B or 21BH; concurrent enrollment in 21C. Continuation of course 21B. Same course content as course 21C. Enrollment for students in the Emerging Scholars Program by instructor’s invitation only. Offered irregularly. (P/NP grading only) GE credit: SE.— (change in existing course—eff. winter 13)

21D. Vector Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 21C or 21CH. Continuation of course 21C. GE credit: SciEng | QL, SE.—I, II, III, IV. (I, II, III, IV.) (change in existing course—eff. winter 13)

22A. Linear Algebra (3)
Lecture—3 hours. Prerequisite: nine units of college mathematics and Engineering 6 or knowledge of Matlab or course 22AL (to be taken concurrently). Matrices and linear transformations, determinants, eigenvalues, eigenvector normalization, factorization. Not open for credit to students who have completed course 67. GE credit: SciEng | QL, SE.—I, II, III, IV. (I, II, III, IV.) (change in existing course—eff. winter 13)

22AL. Linear Algebra Computer Laboratory (1)
Laboratory—2-3 hours. Prerequisite: nine units of college mathematics. Introduction to Matlab and its use in linear algebra. (P/NP grading only) GE credit: QL, SE.—I, II, III, IV. (I, II, III, IV.) (change in existing course—eff. winter 13)

25. Advanced Calculus (4)
Lecture/discussion—4 hours. Prerequisite: course 21B. Introduction to the rigorous treatment of abstract mathematical analysis. Proofs in mathematics, induction, sets, cardinality; real number system, theory of convergence of sequences. Not open for credit to students who have completed former course 127A. GE credit: SciEng | QL, SE.—I, II, III, IV. (I, II, III, IV.) (change in existing course—eff. winter 13)

Upper Division
108. Introduction to Abstract Mathematics (4)
Lecture/discussion—4 hours. Prerequisite: course 21B. A rigorous treatment of mathematical concepts with emphasis on developing the ability to understand abstract mathematical ideas, to read and write mathematical concepts, and to prove theorems. Designed to serve as preparation for the more rigorous upper division courses. GE credit: SciEng, Writ | SE.—I, II, III, (I, II, III.) (change in existing course—eff. winter 13)

111. History of Mathematics (4)
Lecture—3 hours; term paper or discussion. Prerequisite: eight units of upper division Mathematics; one of the following: course 25, 67, 108, 114, 115A, 141, or 145. History of mathematics from ancient times through the development of calculus. Mathematics from Arab, Hindu, Chinese and other cultures. Selected topics from the history of modern mathematics. CE credit: SciEng | SE.—I, II, III (I, II, III.) (change in existing course—eff. winter 13)

114. Convex Geometry (4)
Lecture/discussion—4 hours. Prerequisite: courses 21C; 22A or 67. Topics selected from the theory of convex bodies, convex functions, geometric inequalities, combinatorial geometry, and integral geometry. Designed to serve as preparation for the more rigorous upper division courses. Offered alternate years. GE credit: SciEng | SE.—I, II, III (I, II, III.) (change in existing course—eff. winter 13)

115A. Number Theory (4)
Lecture/discussion—4 hours. Prerequisite: course 21B. Divisibility and related topics, diophantine equations, selected topics from the theory of prime
115B. Number Theory (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 67, 115A. Euler function, Moebius function, congruences, primitive roots, quadratic reciprocity law. Offered in alternate years. GE credit: SciEng | QL, SE.—III. (III.)

116. Differential Geometry (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 125A. Vector analysis, curves, and surfaces in three dimensions. Offered in alternate years. GE credit: SciEng | SE.—III. (III.)

118A. Partial Differential Equations: Elementary Methods (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 21D, 22B, 22A or 67. Derivation of partial differential equations; separation of variables; equilibrium solutions and Laplace’s equation; Fourier series; Green’s functions for the one dimensional wave equation. Solution of nonhomogeneous equations. GE credit: SciEng | QL, SE.—I. (I.)

118B. Partial Differential Equations: Eigenfunction Expansions (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 118A. Sturm-Liouville Theory; self-adjoint operators, mixed boundary conditions; partial differential equations in two and three dimensions; Eigenvalue problems in circular domains; nonhomogeneous problems and the method of eigenfunction expansions; Poisson’s Equations. GE credit: SciEng | QL, SE.—II. (II.)

118C. Partial Differential Equations: Green’s Functions and Transforms (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 118B. Green’s functions for one-dimensional problems and Poisson’s equation; Fourier transforms; Green’s functions for time dependent problems; Laplace transform and solution of partial differential equations. Offered irregularly. GE credit: SciEng | QL, SE.—II. (II.)

119A. Ordinary Differential Equations (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 21D, 22B, 22A or 67. Scalar and planar autonomous systems; nonlinear systems and linearization; existence and uniqueness of solutions; matrix solution of linear systems; phase plane analysis; stability analysis; bifurcation theory; Liapunov’s method; limit cycles; Poincare Bendixon theory. GE credit: SciEng | QL, SE.—II. (II.)

119B. Ordinary Differential Equations (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 119A. Lorentz equations; Poincare maps; center manifolds and normal forms; scalar and planar maps; phase space analysis for iterated maps; period-doubling bifurcation; (typunov exponent); chaos and symbolic dynamics; strange attractors; fractals. GE credit: SciEng | QL, SE.—II. (II.)

124. Mathematical Biology (4)
Lecture—3 hours; project. Prerequisite: courses 22A or 67; 22B. Methods of mathematical modeling of biological systems including difference equations, ordinary differential equations, stochastic and dynamic programming models. Computer simulation methods applied to biological systems. Applications to population growth, cell biology, physiology, evolutionary ecology and protein clustering. MATLAB programming required. Offered in alternate years. GE credit: SciEng | QL, SE.—II. (II.)

125A. Real Analysis (4)
Lecture/discussion—4 hours. Prerequisite: course 25. Functions, limits of functions, continuity and uniform continuity, sequences of functions, series of real numbers, series of functions, power series. Not open for credit to students who have completed former course 127B. GE credit: SciEng | SE.—I, II. (II, III.)

125B. Real Analysis (4)
Lecture/discussion—4 hours. Prerequisite: course 67 and 125A. Theory of the derivative, Taylor series, integration, partial derivatives, Implicit Function Theorem. Not open for credit to students who have completed former course 127C. GE credit: SciEng | SE.—II, III. (II, III.)

128A. Numerical Analysis (4)
Lecture—3 hours; project. Prerequisite: Computer Science: Engineering 30 or equivalent; course 21C; Error analysis; nonlinear equations, numerical integration and differentiation. Programming in language such as Pascal, Fortran, or BASIC required. GE credit: SciEng | QL, SE.—II. (II.)

128B. Numerical Analysis in Solution of Equations (4)
Lecture—2 hours; project. Prerequisite: Computer Science: Engineering 30 or equivalent; courses 21C; 67 or 22A or 67. Solution of nonlinear equations and nonlinear systems. Minimization of functions of several variables. Simultaneous linear equations. Eigenvalue problems. Linear programming. Programming in language such as Pascal, Fortran, or BASIC required. GE credit: SciEng | QL, SE.—II. (II.)

128C. Numerical Analysis in Differential Equations (4)
Lecture—2 hours; project. Prerequisite: Computer Science: Engineering 30 or equivalent; courses 22A or 67; 22B. Difference equations, operators, numerical solutions of ordinary and partial differential equations. Programming in language such as Pascal, Fortran, or MATLAB, or equivalent. GE credit: SciEng | QL, SE.—II. (II.)

129. Fourier Analysis (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 21D; 22A or 67; 22B or 67. Fourier series and integrals, orthogonal sets of functions. Topics selected from trigonometric approximation, orthogonal polynomials, applications to signal and image processing, numerical analysis, and differential equations. GE credit: SciEng | QL, SE.—II. (II.)

133. Mathematical Finance (4)
Lecture—3 hours; off-campus problem solving. Prerequisite: courses 67; 135A. Advanced evaluation of deterministic and random cash flow streams, yield and pricing of basic financial instruments, interest rate theories, modern portfolio theory, capital asset pricing models, utility functions and general principles. MATLAB programming required. Offered in alternate years. GE credit: SciEng | QL, SE.—II. (II.)

133A. Probability (4)
Lecture/discussion—4 hours. Prerequisite: course 125A. Probability space; discrete probability, combinatorial analysis; independence, conditional probability; random variables, discrete and continuous distributions. GE credit: SciEng | QL, SE.—II. (II.)
legislators and staff, and work with lobbyists to understand how policy is made in California. [H/P/F grading only;—] I, II, III, IV. (I, II, III, IV) Moulin
(new course—eff. spring 13)

Medicine: Dermatology

New and changed courses in Dermatology (DER)

Professional

420. Integumentary System (2)
Lecture/discussion—3 hours; clinical activity—0.25 hours. Prerequisite: approval of School of Medicine Committee on Student Promotions. Restricted to medical students only; students must have passed all SOM Year 1 courses. Cell biology, pathology, and physiologic diagnosis of the skin. Recognition of normal variations, and common and important dermatoses. Patient demonstrations of selected conditions. [P/F grading only;—] I, II, III, IV. (I, II, III, IV) Iseroff
(new course in existing course—eff. fall 13)

331B. Scientific Basis of Disease—B (3.5)
Lecture/discussion—3.5 hours. Prerequisite: course 331A, registered student in the Family Nurse Practitioner or Physician Assistant Certificate Program or consent of instructor. Continuation of FAP 331B with expansion of concepts.—IV. (IV) Milton
(change in existing course—eff. summer 12)

334B. Fundamentals of Primary Health Care for FNP/PAs (8)
Lecture/discussion—7 hours; web virtual lecture—1 hour. Open to students in the Family Nurse Practitioner/Physician Assistant Program. Introduces primary health care concepts essential to the care of common medical problems seen in primary care settings. May be repeated two times for credit.—I, II, III, IV. (I, II, III, IV) Hass, O’Rourke, Newman
(change in existing course—eff. fall 13)

358B. Pharmacology (2)
Lecture/discussion—1 hour; discussion—1 hour. Prerequisite: consent of instructor. Restricted to registered students in the Family Nurse Practitioner/Physician Assistant Program. Addresses systems based pharmacology focused on classes of drugs used to treat disease states: ENT, ophthalmology, endocrinology, gastrointestinal, and dermatology. Content is coordinated with the Fundamentals of Primary Health Care course. May be repeated two times for credit.—I, II, III, IV. (I, II, III, IV) Brazil, Christiansen
(change in existing course—eff. fall 12)

358D. Pharmacology (2)
Lecture/discussion—1 hour; discussion—1 hour. Restricted to students in the Family Nurse Practitioner/Physician Assistant Program. Systems based pharmacology focused on classes of drugs used to treat disorders in the following systems: musculoskeletal, urology, neurology, hematology/oncology, and psychiatry/behavioral medicine. May be repeated two times for credit.—I, II, III, IV. (I, II, III, IV) Brazil, Christiansen
(new course—eff. spring 13)

368A. Behavioral Science for FNP/PA Students (2)
Lecture/discussion—1 hour; seminar—1 hour. Prerequisite: registered student in the Family Nurse Practitioner/Physician Assistant Certificate Program or consent of instructor. Normal psychosocial development in family system theory as it relates to primary care for assessment, coping, strategies, resources, and goals. Health behavioral changes. Chronic care model.—IV. (IV) Henderson
(change in existing course—eff. summer 12)

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; Wrt—Writing Experience
Fall 2011 and on General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QA—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Medicine: Family and Community Medicine

New and changed courses in Medicine—Family and Community Medicine (FAP)

Graduate

252A. Professional Role Development (1-3)
Seminar—1—3 hours. Prerequisite: enrollment in the Master’s Track of the FNP Certificate Program. Professional role development and clinical management issues based on family nursing theory and research.—IV. (IV) Ceesay-Brown
(new course in existing course—eff. summer 12)

300. Health Assessment for Advanced Practice (1-4)
Lecture/discussion—3 hours; laboratory/discussion—2 hours; seminar—1 hour. Prerequisite: enrolled in the Family Nurse Practitioner or Physician Assistant Certificate Program, or consent of instructor. Fundamentals of clinical skills in health and physical assessment, effective communication in the clinical provider/patient relationship. Professional behavior and cultural sensitivity.—IV. (IV) Ceasy-Slater, Himmerick
(new course in existing course—eff. summer 12)

300D. Health Assessment for Advanced Practice (1-5)
Lecture/discussion—2 hours; laboratory/discussion—1.5 hours; clinical activity—1.5 hours. Prerequisite: enrollment in the Family Nurse Practitioner/Physician Assistant Program. Restricted to students in the Family Nurse Practitioner/Physician Assistant Program only. Instruction and practice of the fundamental clinical skills necessary for patient care comprise this course with a primary focus on advanced clinical skills, principles of clinical decision making, and evaluation of presentation skills. May be repeated two times for credit with instructor’s recommendation. [S/U grading only;—] I, II, III, IV. (I, II, III, IV) Himmerick
(new course—eff. spring 13)

331A. Scientific Basis of Diseases—A (3.5)
Lecture/discussion—3 hours; web electronic discussion—5 hours. Prerequisite: registered student in the Family Nurse Practitioner or Physician Assistant Cer-

ficate Program or consent of instructor. Anatomy, physiology and concepts of pathophysiology.—IV. (IV) Milton
(change in existing course—eff. summer 12)

Professional

430A. SJVP Longitudinal Medicine Clerkship at UCSF (A) (4)
Clinical activity—45 hours; lecture—2 hours; workshops—2 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. [H/P/F grading only; deferred grading only, pending completion of sequence;—] I, II, III, IV. (I, II, III, IV) Eidson-Ton,
Vierra
(new course—eff. spring 13)

430B. SJVP Longitudinal Primary Care Clerkship at UCSF (B) (6.5)
Clinical activity—45 hours; lecture—2 hours; workshops—2 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. [H/P/F grading only; deferred grading only, pending completion of sequence;—] I, II, III, IV. (I, II, III, IV) Eidson-Ton,
Vierra
(new course—eff. summer 13)

430C. SJVP Longitudinal Primary Care Clerkship at UCSF (C) (1.5)
Clinical activity—45 hours; lecture—2 hours; workshops—2 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. [H/P/F grading only; deferred grading only, pending completion of sequence;—] I, II, III, IV. (I, II, III, IV) Eidson-Ton,
Vierra
(new course—eff. summer 13)

430A. TeachMS Longitudinal Primary Care Clerkship (A) (4)
Clinical activity—45 hours; lecture—2 hours; workshops—2 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Internal Medicine and Psychiatry for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. [H/P/F grading only; deferred grading only, pending completion of sequence;—] I, II, III, IV. (I, II, III, IV) Eidson-Ton,
Vierra
(new course—eff. fall 13)

430B. TeachMS Longitudinal Primary Care Clerkship (B) (6)
Clinical activity—45 hours; lecture—2 hours; workshops—2 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Internal Medicine and Psychiatry for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. [H/P/F grading only; deferred grading only, pending completion of sequence;—] I, II, III, IV. (I, II, III, IV) Eidson-Ton, Henderson, Holt, Vierra
(new course—eff. fall 13)

430C. TeachMS Longitudinal Primary Care Clerkship (C) (2)
Clinical activity—45 hours; lecture—2 hours; workshops—2 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Internal Medicine and Psychiatry for 24 weeks. Time is spent in direct patient care situations under

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2013-2014 offering in parentheses

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the guidance of faculty. On-going patient write-ups, rounds, conferences are required. (H/P/F grading only; deferred grading only, pending completion of sequence.)—III, (III.) Eidson-Ton, Henderson, Holt, Vierra
(new course—eff. fall 13)

Medicine: Human Physiology

New and changed courses in Human Physiology (HPH)

Professional

405S. Metabolism, Endocrinology, Reproduction and Nutrition (9.5)
(canceled course—eff. spring 12)

420C. Pulmonary & Critical Care Medicine (2.5)
Laboratory/discussion—5.5 hours. Prerequisite: approval of SOM’s Committee on Student Promotions. Restricted to Medical students only; student must pass all SOM Year 1 courses. Clinical aspects of respiratory anatomy, physiology, and pathology. Diagnostic procedures and a description of the major pulmonary diseases & disorders, and critical care medicine. (P/F grading only.)—I. (I.) Stollenwerk
(change in existing course—eff. fall 13)

420D. Cardiovascular System (2.5)
Lecture/discussion—5.5 hours. Prerequisite: Approval of the School of Medicine Committee on Student Promotions. Restricted to Medical students only; student must pass all SOM Year 1 courses. Principles of etiology, mechanisms, diagnosis and management of the major diseases of the cardiovascular system. Includes specific ischemic, valvular, hypertensive, cardiomyopathic, pericardial, and electrical disorders. (P/F grading only.)—I. (I.) Venugopal
(change in existing course—eff. fall 13)

430FA. SJVP Longitudinal Medicine Clerkship at UCSF (A) (4)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence.)—I, (I., II, III, IV.) Aronowitz, Johl
(new course—eff. fall 13)

430FC. SJVP Longitudinal Medicine Clerkship at UCSF (C) (1.5)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence.)—IV. (IV.) Aronowitz, Johl
(new course—eff. summer 13)

430FC. SJVP Longitudinal Medicine Clerkship at UCSF (C) (1.5)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence.)—IV. (IV.) Aronowitz, Johl
(new course—eff. summer 13)

430FC. SJVP Longitudinal Medicine Clerkship at UCSF (C) (1.5)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence.)—IV. (IV.) Aronowitz, Johl
(new course—eff. summer 13)

430FA. SJVP Longitudinal Medicine Clerkship at UCSF (A) (4)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence.)—I, (I., II, III, IV.) Aronowitz, Johl
(new course—eff. spring 13)

430FB. SJVP Longitudinal Medicine Clerkship at UCSF (B) (6.5)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence.)—IV. (IV.) Aronowitz, Johl
(new course—eff. spring 13)

430BC. SJVP Longitudinal Medicine Clerkship at UCSF (B) (6.5)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence.)—IV. (IV.) Aronowitz, Johl
(new course—eff. spring 13)

Medicine: Internal Medicine

Gastroenterology

New and changed courses in Internal Medicine—
Gastroenterology (GAS)

Professional

460. Gastroenterology Clinical Clerkship (3-18)
Clinical activity—30 hours. Prerequisite: completion of third year of medical school. Work-up, manage, and follow-up new patients on active inpatient consulting service. Gastroenterology/Hepatology patient visits. Daily rounds with attending physician. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV.) Terrado
(change in existing course—eff. summer 13)

Medicine: Internal Medicine—General Medicine

New and changed courses in Internal Medicine—General Medicine (GMD)

Professional

470. Health Care Ethics (3-9)
Lecture/discussion—2 hours; laboratory/discussion—1 hour. Prerequisite: consent of instructor. Guided independent study of issues in biomedical ethics, with discussion of readings that are based on student interests and needs. Participation in ethics rounds. (Same course as Nursing 470.) (S/U grading only.)—I, II, III, IV. (I, II, III, IV.) Loey
(new course—eff. spring 12)

Medicine: Internal Medicine—Hematology-Oncology

New and changed courses in Internal Medicine—Hematology- Oncology (HON)

Professional

420. Oncology (4)
Lecture/discussion—2 hours. Prerequisite: approval by the SOM Committee on Student Promotions. Restricted to Medical student only; students must pass all Year 1 SOM courses. Covers the principles of oncology and the pathophysiology of specific, common cancers correlated with organ systems pathophysiology and systemic pathology courses. (P/F grading only; deferred grading only, pending completion of sequence.)—I, II, (I, II.) Welborn
(change in existing course—eff. fall 13)
Medicine: Internal Medicine—Pulmonary Medicine

New and changed courses in Internal Medicine—Pulmonary Medicine (PUL)

Professional

460. Comprehensive Pulmonary Medicine Clerkship (3-6)
Clinical activity—40 hours. Prerequisite: completion of second year of medical school and/or consent of instructor; completion of Internal Medicine Clerkship. Rotation intended to provide a comprehensive student education in Pulmonary Medicine. Student will participate in hands on clinical education, as well as completing an assigned curricula. Intended for students pursuing Internal Medicine & Primary Care careers. May be repeated for credit. (H/P/F grading only)–I, II, III, IV. (I, II, III, IV.) Stollenwerk (change in existing course—eff. summer 13)

461. Critical Care Clinical Clerkship (3-6)
Clinical activity—40 hours. Prerequisite: completion of second year of medical school and/or consent of instructor; completion of Internal Medicine and Surgical Clerkships. Rotation intended to provide student education in the Critical Care Management of sub-specialty patients. May be repeated for credit. (H/P/F grading only)–I, II, III, IV. (I, II, III, IV.) Stollenwerk (new course—eff. summer 13)

462. Pulmonary Clinical Clerkship (3-6)
Clinical activity—35 hours. Prerequisite: completion of second year of medical school and/or consent of instructor; completion of Internal Medicine Clerkship. Similar to course 460. Rotation designed for students interested in learning pulmonary medicine, but who desire more variety in their clerkships, and do not desire the comprehensive experience offered by a four-week pulmonary rotation. May be repeated for credit. (H/P/F grading only)–I, II, III, IV. (I, II, III, IV.) Stollenwerk (change in existing course—eff. summer 13)

Medicine: Internal Medicine—Rheumatology-Allergy

New and changed courses in Internal Medicine—Rheumatology-Allergy (RAL)

Graduate

299. Research in Autoimmune Disease (1-12)
Laboratory. Prerequisite: consent of instructor. Independent research will be encouraged in both animal models of human disease (including congenitally athymic [nude], asplenic, and New Zealand mice) and the cellular immune system of patients with systemic lupus erythematosus, Sjogren’s syndrome, polymyositis and drug hypersensitivity. (S/U grading only)–Adamopoulos (change in existing course—eff. winter 13)

Medicine: Medical Microbiology

New and changed courses in Medical Microbiology (MMI)

Professional

210A. Critical Analysis of Contemporary Research on Animal Models of Human (1) Lecture/discussion—1 hour. Prerequisite: students funded by the Animal Models of Infectious Diseases Training Grant; consent of instructor. Topics will include diverse vertebrate and invertebrate models of human infectious diseases. Limited enrollment. May be repeated for credit. (S/U grading only)–II. (II.) Bevins, Solnick (new course—eff. fall 13)

Medicine: Obstetrics and Gynecology

New and changed courses in Medicine: Obstetrics and Gynecology (OBG)

Professional

405. Metabolism, Endocrinology, Reproduction and Nutrition (9.5) (cancelled course—eff. spring 12)

430F. SJVP OBGYN Clerkship at UCSF (12)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress. Obstetrics, gynecologic and gynecological oncology experience in the delivery room, operating room, clinics and wards at UCSF Fresno. Rounds, conferences, interactive student presentations and seminars ongoing. (H/P/F grading only)–I, II, III, IV. (I, II, III, IV.) Hou (new course—eff. fall 13)

472. Family Planning and Reproductive Health (1-6)
Clinical activity—30 hours; seminar—10 hours. Prerequisite: course 430; consent of instructor. Elective that will focus on the Gynecologic Subspecialty of Family Planning. Counseling and provision of contraceptive methods, experience with pelvic ultrasounds, management of spontaneous, inevitable and induced abortion and postabortion care by both surgical and medical techniques are included. May be repeated for credit. (H/P/F grading only)–I, II, III, IV. (I, II, III, IV.) Hou (new course—eff. spring 13)

494A. Shifa Clinic (1)
Clinical activity—8 hours. Prerequisite: Medical student in good standing; consent of instructor. Interaction with patients from multiple ethnic and cultural backgrounds under the direct supervision of a physician/preceptor. Women’s health issues and primary care issues in a diversely mixed population. (H/P/F grading only; deferred grading only, pending completion of sequence.)–IV. (IV.) Yasmeen (new course—eff. summer 12)

494C. Shifa Clinic (1)
Clinical activity—8 hours. Prerequisite: Medical student in good standing; consent of instructor. Interaction with patients from multiple ethnic and cultural backgrounds under the direct supervision of a physician/preceptor. Women’s health issues and primary care issues in a diversely mixed population. (H/P/F grading only; deferred grading only, pending completion of sequence.)–II. (II.) Yasmeen (new course—eff. summer 12)

Medicine: Orthopaedic Surgery

New and changed courses in Orthopaedic Surgery (OSU)

Professional

421. The Musculoskeletal System (2.5) Lecture/discussion—4 hours; discussion—2 hours. Prerequisite: consent of student. Medical student only. Basic and clinical science of orthopaedic surgery and rheumatology. (P/NP grading only)–I. (I.) Marder, VanDenBogaerde (change in existing course—eff. summer 12)

465. Externship in Advanced Orthopaedics (3-6)
Clinical activity—40 hours. Prerequisite: fourth-year medical student in good academic standing and consent of instructor. Advanced Orthopaedic rotation done at an approved institution. Topics may include Trauma, Sports, Spine, Pediatrics, Joint and/or Foot/Ankle. Students are expected to perform at the level of an Intern. (H/P/F grading only)–I, II, III, IV. (I, II, III, IV.) (new course—eff. summer 13)

Medicine: Pathology

New and changed courses in Medicine: Pathology (PMD)

Professional

407. Advanced Neuropathology (3) Lecture/discussion—40 hours. Prerequisite: third or fourth year medical student and consent of instructor. Restricted to Medical students only. Presents an integrated introduction to mechanisms of the central and peripheral nervous system injury. Students will gain an understanding of pathological mechanisms underlying disease, the anatomy and molecular manifestations of pathologic processes of the CNS and PNS. (P/F grading only)–I, II, III, IV. (I, II, III, IV.) Luchhammer (change in existing course—eff. spring 13)

410A. General and Endocrine Pathology (2.5) Lecture—4 hours; laboratory/discussion—4.5 hours. Restricted to Medical students only. Pathologic mechanisms of human disease. Concepts of general pathologic processes, i.e., cell death, inflammation and neoplasia. Endocrine pathology in the context of clinical human disease. Emphasis on integration of clinical practice with gross and histologic images emphasizing team-based learning. (P/F grading only; deferred grading only, pending completion of sequence.)–I, II, III. (I, III.) Gandour-Edwards (change in existing course—eff. fall 13)

Medicine: Pediatrics

New and changed courses in Medicine: Pediatrics (PED)

Professional

430F. SJVP Pediatric Clerkship at UCSF (12) Clinical activity—45 hours. Prerequisite: approval by SOM Committee on Student Progress. Restricted to medical student only. Eight-week clinical clerkship providing students with the opportunity to learn fundamentals of caring for the pediatric patient by participating in nursery, ambulatory and inpatient care.
services at UCSF Fresno. Rounds, conferences, students, and supervisors. (H/P/F grading only.)—I, II, III, IV. (II, III, IV, IV) Butani
(new course—eff. fall 13)

Medicine: Pharmacology and Toxicology

New and changed courses in Medicine: Pharmacology and Toxicology (PHA)
Graduate
208. Advanced Cardiac Physiology and Pharmacology (3)
Lecture—2 hours; lecture/discussion—1 hour. Prerequisite: Pharmacology and Toxicology 201, Pharmacology and Toxicology 202, an equivalent course in general pharmacology or physiology [example, Biomedical Engineering 204], or knowledge of basic pharmacology/physiology. Open to graduate students from the Pharmacology and Toxicology, Molecular, Cellular and Integrated Physiology, Biomedical Engineering and Clinical Research Graduate Groups; other students (including undergraduates) may be accepted upon consultation with the instructors. Detailed characterization of the mechanisms involved in cardiac excitation–contraction coupling, alterations that occur in heart disease and pharmacological interventions. Topics include cardiac contractile apparatus, action potential, Ca cycling, excitation–transcription coupling, cardiac inotropy, heart failure and arrhythmias.—III. (III.) Bossuyt, Despa, Ripplinger
(new course—eff. spring 13)

430FC. SJVP Longitudinal Psychiatry Clerkship at UCSF (C) (1.5)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence.)—I, (II.) Tonn
(new course—eff. summer 13)

430TA. TeachMS Longitudinal Psychiatry Clerkship (A) (4)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Promotions; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Medicine for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence.)—I, (II.) Tonn
(new course—eff. fall 13)

430TB. TeachMS Longitudinal Psychiatry Clerkship (B) (6)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Promotions; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Medicine for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence.)—I, (II.) Tonn
(new course—eff. fall 13)

430TC. TeachMS Longitudinal Psychiatry Clerkship (C) (8)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Promotions; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Medicine for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence.)—I, II, III, IV. (I, II, III, IV, IV) Chen
(new course in existing course—eff. fall 12)

Medicine: Radiation Oncology

New and changed courses in Medicine: Radiation Oncology (RON)
Graduate
299. Independent Study and Research (1-12)
Lab—3-40 hours. Prerequisite: enrollment with a Graduate Group for Ph.D. candidacy and consent of Group Advisor and Sponsor. Research under supervision of Radiation Oncology faculty. Work must be suitable to fulfill the requirements for the Ph.D. degree. [S/U grading only]—I, II, III, IV. (I, II, III, IV, IV) Coleman, Li, Vaughan
(change in existing course—eff. summer 12)

463. Radiation Oncology Clerkship (3-9)
Clinical activity—30 hours. Prerequisite: completion of Medical Sciences 430, 431, third-year clinical clerkship, consent of instructor required. Introduction to radiation oncology. Students will participate in workup and treatment planning for radiation oncology patients and will be introduced to the concepts involved in clinical radiation oncology, radiation biology, and radiation physics. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Chen
(change in existing course—eff. summer 12)

Medicine: Surgery—Diagnostic

New and changed courses in Medicine: Radiology—Diagnostic (RD1)
Professional
461. Advanced Clinical Clerkship in Diagnostic Radiology (3-6)
Clinical activity—35 hours; conference—4 hours; discussion/laboratory—1 hour. Prerequisite: satisfactory completion of second year medical school curriculum, and of third-year clerkships in Internal Medicine and General Surgery; consent of instructor of record. Restricted to eight students per rotation; open to visiting medical and osteopathic students from accredited programs. Work with clinical Radiologists in image interpretation, fluorescence, angiography, image-guided intervention, cardiac stress testing, radionuclide therapy. Daily conferences in Radiology Diagnosis and Therapy, Health Physics, Radiation Safety. Prepare three clinical cases for in-class presentation. Assigned readings. Comprehensive final examination. May be repeated for credit. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Hagge
(change in existing course—eff. summer 13)

Medicine: Solar System

New and changed courses in Medicine: Surgery (SUR)
Professional
430SF. SJVP Surgery Clerkship at UCSF (12)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress. Eight-week general surgery clerkship includes GI, Burn, Oncology, Plastics, Vascular Cardiotho-
Microbiology

New and changed courses in Microbiology (MIC)

Lower Division

91. Introduction to Research (1)
Seminar—1 hour. Prerequisite: Biological Sciences 1A or 2A or consent of instructor. Discussion of faculty research focusing on the biochemistry, genetics, and cell biology of microorganisms, along with ways undergraduates can participate in research projects of faculty members. May be repeated three times for credit. (P/NP grading only.) GE credit: SE.—III. (III.) Lin, Xu

[change in existing course—eff. winter 13]

101L. Microbiology Laboratory (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: course 100 or 102. DNA; polymerase chain reaction; and sequence annotation. Graduate students see course 105L. Not open for credit to students who have completed course 102 or 104. Not offered every year. GE credit: SciEng | SE.—I. (I.) Stewart

[change in existing course—eff. winter 13]

101R. Microbiology (4)
Lecture—4 hours. Prerequisite: Biological Sciences 101; 102; 103 or 105. Designed for students continuing in microbiology or using microorganisms as tools for the study of genetics and biochemistry. Biology of microorganisms, including viruses, archaea, bacteria, fungi, and eukaryotes. Topics include: microbial structure, growth, antibiotics, pathogenesis, immunology, and epidemiology. Only two units of credit for students who have taken course 101. Not open for credit to students who have completed course 102. GE credit: SciEng | SE.—I. (I.) Stewart

[change in existing course—eff. winter 13]

101L. Microbiology Laboratory (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: course 100 or 102 (may be taken concurrently); consent of instructor. Students must complete a petition for consideration of enrollment; petition available on department of Microbiology website. Introduction to principles and laboratory methods in microbiology. Design for students continuing in microbiology or using microorganisms as tools for the study of genetics and biochemistry. In combination with course 104, fulfills the microbiology requirement for professional schools. Only two units of credit allowed to students who have completed course 101. Not open to students who have completed course 102L. GE credit: SciEng | SE, WE.—I. (I.) Igo, Nelson

[change in existing course—eff. winter 13]

105. Microbial Diversity (3)
Lecture—3 hours. Prerequisite: course 102 or 104; Biological Sciences 103 or 105. Survey of microbial diversity in the three domains of Life: Bacteria, Archaea, and microbial eukaryotes. Emphasizes microbial evolution and phylogeny, physiology and metabolism, global biogeochemical cycles, environmental adaptations, and genomic methods for analyzing latent, environment-dependent microbial diversity and microbial communities. GE credit: SciEng | SE.—II. (II.) Dawson, Parales

[change in existing course—eff. winter 13]

105L. Microbial Diversity Laboratory (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: course 102 or 104; 102L or 104L; 105 (may be taken concurrently); Biological Sciences 103 or 105. Students must complete a petition for consideration of enrollment; petition available on department of Microbiology website. Classical enrichments for the isolation of metabolically diverse microbes; modern molecular methods for the identification of isolates; cultivation independent analysis of microbial communities from local environmental samples. GE credit: SciEng | SE.—II. (II.) Dawson, Parales

[change in existing course—eff. winter 13]

115. Recombinant DNA Cloning and Analysis (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101 or equivalent. Cloning and analysis of recombinant DNA, with emphasis on Escherichia coli host-vector systems. DNA-modifying enzymes; vectors and their use; manipulation and expression of insert DNA; polymerase chain reaction; and sequence annotation. Graduate students see course 215. Not offered every year. GE credit: SciEng | SE.—I. (I.) Xu

[change in existing course—eff. winter 13]

120. Microbial Ecology (3)
Lecture—3 hours. Prerequisite: course 105, Biological Sciences 102 or 105. Interactions between non-pathogenic microorganisms and their environment, emphasizing physiological and metabolic characteristics of various groups and their adaptation to and modification of specific habitats. Not offered every year. GE credit: SciEng | SE.—III. (III.) Nelson

[change in existing course—eff. winter 13]

140. Viral Physiology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101, 102, 103 or 105 may be taken concurrently, or Biological Sciences 101, 105; Microbiology 102 recommended. Fundamentals of viral growth and biological responses to environmental stresses. Topics will include carbon and nitrogen regulation, growth rate control, growth, viral replication, and motility and chemotaxis. Not open for credit to students who have completed course 130A. Not offered every year. GE credit: SciEng | SE.—I. (I.) Stewart

[change in existing course—eff. winter 13]

150. Bacterial Genetics (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101, 102, Biological Sciences 103 or 105; course 102 recommended. Molecular genetics of enterobacteria and their viruses. Isolation of mutants; genetic exchange and mapping; complementation; suppression; transposition; gene expression and regulation; and genomics. Examples will illustrate applications to molecular cloning of recombinant DNA, and to the study of bacterial pathogenesis. Not offered every year. GE credit: SciEng | SE

[change in existing course—eff. winter 13]

162. General Virology (4)
Lecture—4 hours. Prerequisite: Biological Sciences 102 or 105. Integrated presentation of the nature of animal, bacterial, and plant viruses, including their structure, replication and genetics. Only three units to students who have completed Pathology, Microbiology, and Immunology 128. GE credit: SciEng | SE.—II. (II.) Falk, Manning

[change in existing course—eff. winter 13]

170. Yeast Molecular Genetics (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101 and 102; course 102 or 140 (may be taken concurrently) strongly recommended. Survey of the
Molecular and Cellular Biology

New and changed courses in Molecular and Cellular Biology (MCB)

Lower Division

99. Special Study (1-5)

Web virtual lecture—1.5 hours; web electronic discussion—1 hour. Prerequisite: course 100 recommended. Class size limited to 15 students. Seminar in Arab Studies topics. May be repeated three times for credit. GE credit: WE. —Ill. (III.) [new course—fall 13]

Upper Division

110V. ibioseminars in Cell and Molecular Biology (3)

Web virtual lecture—1.5 hours; web electronic discussion—1 hour; lecture/discussion—1.5 hours. Prerequisite: Biological Sciences 101, 102 and 103 or 104 and 106. Hybrid course in Cell and Molecular Biology for senior level (I) Biochemistry/Molecular Biology; (II) Genetics; or (III) Cell Biology majors. Face-to-face instruction combined with online lectures available at ibioseminars website delivered by leading researchers in Cell and Molecular Biology. GE credit: SciEng | OL, QL, SE, SL.—I, II, III. (I, II, III.) (change in existing course—spring 13)

120L. Molecular Biology and Biochemistry Laboratory (6)

Lecture—3 hours; laboratory—6 hours; discussion—1 hour. Prerequisite: course 101 or 102. Lecture: behavior and analysis of enzyme and receptor systems. Laboratory: exercise and observation of cellular growth and metabolism. GE credit: SciEng | QL, SE, SL.—II. (II.) (change in existing course—fall 13)

123. Behavior and Analysis of Enzyme and Receptor Systems (3)

Lecture—3 hours. Prerequisite: Biological Sciences 103. Introduction to the principles of enzyme kinetics and receptor-ligand interactions with emphasis on metabolic regulation and data analysis. Topics include simultaneous equilibria, chemical and steady-state kinetics, allosteric enzymes, multireaction system, enzyme assays, membrane transport and computer-assisted simulations and analyses. GE credit: SciEng | QL, SE.—I, II, III. (I, II, III.) (change in existing course—summer 13)

124. Macromolecular Structure and Function (4)

Lecture—4 hours. Prerequisite: Biological Sciences 103, Chemistry 118C. An in-depth investigation into protein and nuclear acid structure and thermodynamics and how these properties influence their biological functions. Key examples of important functional classes of these molecules will be examined. Not open for credit to students who have completed course 122 or Chemistry 108. GE credit: SciEng | SE.—I, II, III. (I, II, III.) (change in existing course—summer 13)
150. Developmental Biology (4)
Lecture—4 hours. Prerequisite: Biological Sciences 101. Analysis of the mechanistic basis for animal development with a focus on experimental evidence and the relevant fundamental experimental strategies. Fertilization and early development, morphogenesis, development of the nervous system and regulation of cell proliferation and tissue growth. GE credit: SciEng | SE, SL—II, III.
(Change in existing course—eff. winter 13)

158. Undergraduate Seminar in Developmental Biology (2)
Seminar—2 hours. Prerequisite: upper division standing in the biological sciences or a related discipline. Student reports on current topics in cell biology with emphasis on integration of concepts, synthesis, and state-of-the-art research approaches. Reviews of literature and participation in undergraduate research may be included. May be repeated for credit. (P/NP grading only.) GE credit: OL, SE—II, III.
(Change in existing course—eff. winter 13)

160L. Principles of Genetics Laboratory (5)
Laboratory—6 hours; lecture—2 hours, discussion/laboratory—1 hour. Prerequisite: Biological Sciences 101. Laboratory work in basic and molecular genetics including gene mapping, isolation and characterization of mutants in eukaryotic model systems, reverse electrophoresis, recombinant DNA techniques, and PCR. Not open for credit to students who have completed Genetics 100L. GE credit: SciEng | OL, SE, VL, WE—II, III, III.
(Change in existing course—eff. winter 14)

190C. Undergraduate Research Conference (1)
Discussion—1 hour. Prerequisite: upper division standing and consent of instructor; concurrent enrollment in course 193 or 199. Presentation and discussion of current research by faculty. May be repeated for credit. (P/NP grading only.) GE credit: SE—II, III.
(Change in existing course—eff. winter 13)

191. Introduction to Research (1)
Seminar—1 hour. Prerequisite: Biological Sciences 102 (may be taken concurrently) or consent of instructor. Introduction to topics in molecular and cellular biology including biochemistry, genetics, and cell biology will be discussed, along with ways undergraduates may participate in research projects of faculty members. May be repeated for credit. (P/NP grading only.) GE credit: SE—II, III.
(Change in existing course—eff. winter 13)

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: completion of 84 units and consent of instructor. Technical and/or practical experience on and off campus, supervised by a member of the Section of Molecular and Cellular Biology faculty. (P/NP grading only) GE credit: SE.
(Change in existing course—eff. winter 13)

193. Advanced Research (3)
Laboratory—6 hours; discussion—1 hour. Prerequisite: upper division standing, completion of an upper division Molecular and Cellular Biology laboratory course and consent of instructor. Research project carried out under the supervision of a faculty sponsor. Discussion and analysis of results and proposed experiments on a weekly basis with faculty sponsor.

194H. Research Honors (3)
Independent study—9 hours. Prerequisite: 6 units of course 193 and/or 199 with faculty director; senior standing; GPA of at least 3.250; consent of Section. Honors project. Continuation of an individual, individual laboratory research project in biochemistry, genetics, or cell biology culminating with the presentation of the work in a written thesis and in a seminar. (P/NP grading only.) GE credit: OL, SE, WE.
(Change in existing course—eff. winter 13)

197T. Tutoring in Molecular and Cellular Biology (1-5)
Tutoring—2 hours. Prerequisite: consent of instructor. Training to meet the minimum piano requirements for the major in music. GE credit: SciEng | SE, SL—II, III, III.
(Change in existing course—eff. winter 13)

198. Directed Group Study (1-5)
Variable—1-5 hours. Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.
(Change in existing course—eff. winter 13)

199. Special Study for Advanced Undergraduates (1-12)
Independent study—3-15 hours. Prerequisite: consent of instructor. (P/NP grading only) GE credit: SE.
(Change in existing course—eff. winter 13)

Graduate

220L. Advanced Biochemistry Laboratory Rotations (5)
Laboratory—15 hours. Prerequisite: course 210 and 211 (may be taken concurrently) and 120L or the equivalent. Two lecture courses in BCMDB. Individual research problems with emphasis on methodological/procedural experience, experimental design, proposal writing and oral communication of results. May be repeated two times for credit. —II, III.
(Change in existing course—eff. winter 14)

232. Keyboard Competence, Part 3 (2)
Performance—2 hours. Prerequisite: course 6A and 16A concurrently; consent of instructor. Training to meet the minimum piano requirements for the major in music. Scales and simple harmonic progressions in twelve keys, both major and minor. (P/NP grading only.) GE credit: AH—II.
(Change in existing course—eff. winter 13)

233. Keyboard Competence, Part 2 (2)
Performance—2 hours. Prerequisite: courses 6B and 16B concurrently; successful completion of course 2A or demonstration of required keyboard proficiency level on diagnostic exam; consent of instructor. Training to meet the minimum piano requirements for the major in music. Harmonic progressions, modulations and score reading at the piano. (P/NP grading only) GE credit: AH—II.
(Change in existing course—eff. winter 13)

234. Keyboard Competence, Part 1 (2)
Performance—2 hours. Prerequisite: course 6C and 16C concurrently; successful completion of course 2B or demonstration of required keyboard proficiency level on diagnostic exam; consent of instructor. Training to meet the minimum piano requirements for the major in music. Homophonic music of the Classical era; music of the Romantic era. Focus on analysis of music by Chopin, Schumann, Brahms, Wagner, and Wolf. Composition of character pieces and songs. Intended for music majors. GE credit: AH—II.
(Change in existing course—eff. winter 13)

24A. Elementary Theory, Part 1 (3)
Lecture—1 hour; recitation—3 hours. Prerequisite: completion of course 3A or permission of the instructor. Continuation of course 3A. Development of melodic and harmonic writing skills. Basic analysis training. Intended for the general student. GE credit: AH—II.
(Change in existing course—eff. winter 13)

24B. Elementary Theory, Part 2 (3)
Lecture—1 hour; recitation—3 hours. Prerequisite: completion of course 3A or permission of the instructor. Continuation of course 3A. Development of melodic and harmonic writing skills. Basic analysis training. Intended for the general student. GE credit: AH—II.
(Change in existing course—eff. winter 13)

24C. Elementary Theory, Part 3 (3)
Lecture—1 hour; recitation—3 hours. Prerequisite: completion of course 3A or permission of the instructor. Continuation of course 3A. Development of melodic and harmonic writing skills. Basic analysis training. Intended for the general student. GE credit: AH—II.
(Change in existing course—eff. winter 13)

299. Independent Study (1-5)
Independent study—9 hours. Prerequisite: 6 units of required proficiency level on diagnostic exam. Continuation of course 6A.
(Change in existing course—eff. winter 13)

Music

New and changed courses in Music (MUS)

Lower Division

2A. Keyboard Competence, Part 1 (2)
Performance—2 hours. Prerequisite: course 6A and 16A concurrently; consent of instructor. Training to meet the minimum piano requirements for the major in music. Scales and simple harmonic progressions in twelve keys, both major and minor. (P/NP grading only.) GE credit: AH—II.
(Change in existing course—eff. winter 13)

2B. Keyboard Competence, Part 2 (2)
Performance—2 hours. Prerequisite: courses 6B and 16B concurrently; successful completion of course 2A or demonstration of required keyboard proficiency level on diagnostic exam; consent of instructor. Training to meet the minimum piano requirements for the major in music. Harmonic progressions, modulations and score reading at the piano. (P/NP grading only) GE credit: AH—II.
(Change in existing course—eff. winter 13)

2C. Keyboard Competence, Part 3 (2)
Performance—2 hours. Prerequisite: course 6C and 16C concurrently; successful completion of course 2B or demonstration of required keyboard proficiency level on diagnostic exam; consent of instructor. Training to meet the minimum piano requirements for the major in music. Performance of required repertoire. (P/NP grading only) GE credit: AH—II.
(Change in existing course—eff. winter 13)

3A. Introduction to Music Theory, Part 1 (4)
Lecture—1 hour; recitation—3 hours. Fundamentals of music theory, ear-training, harmony, counterpoint, and analysis directed toward the development of listening and writing techniques. Intended for the general student. GE credit: ArtHum | AH—II.
(Change in existing course—eff. winter 13)

3B. Introduction to Music Theory, Part 2 (4)
Lecture—1 hour; recitation—3 hours. Prerequisite: completion of course 3A or permission of the instructor. Continuation of course 3A. Development of melodic and harmonic writing skills. Basic analysis training. Intended for the general student. GE credit: ArtHum | AH—II.
(Change in existing course—eff. winter 13)

6A. Elementary Theory, Part 1 (3)
Lecture—3 hours. Prerequisite: Admission by examination given during the first class meeting; concurrent enrollment in course 16A and 2A or demonstration of required proficiency level on diagnostic exam. Continuation of course 6A.
(Change in existing course—eff. winter 13)

6B. Elementary Theory, Part 2 (3)
Lecture—3 hours. Prerequisite: course 6A; concurrent enrollment in course 16B and 2B or demonstration of required proficiency level on diagnostic exam. Continuation of course 6A.
(Change in existing course—eff. winter 13)

6C. Elementary Theory, Part 3 (3)
Lecture—3 hours. Prerequisite: course 6B; concurrent enrollment in course 16C and 2C or demonstration of required proficiency level on diagnostic exam. Continuation of courses 6A-B.
(Change in existing course—eff. winter 13)

7A. Intermediate Theory, Part 1 (3)
Lecture—3 hours. Prerequisite: course 6C; course 178 concurrently. Homophonic music of the Classical era with a focus on analysis of music by Haydn, Mozart, and Beethoven. Composition of pieces in the homophonic forms such as minuet and trio, theme and variations, rondo and sonata. Intended for music majors. GE credit: ArtHum | AH—II.
(Change in existing course—eff. winter 13)

7B. Intermediate Theory, Part 2 (3)
Lecture—3 hours. Prerequisite: course 7A; course 178 concurrently. Nineteenth-century harmony and voice leading through the music of Schumann, Brahms, Wagner, and Wolf. Composition of character pieces and songs. Intended for music majors. GE credit: ArtHum | AH—II.
(Change in existing course—eff. winter 13)

7C. Intermediate Theory, Part 3 (3)
Lecture—3 hours. Prerequisite: course 7B; course 17C concurrently. The music of the first thirty years of the twentieth century and various analytical tools
pertaining to it. Works of Debussy, Stravinsky, Schoenberg, Berg, and others. Composition of small pieces for solo instruments, voice and piano. Intended for Music majors. GE credit: ArtHum | AH.—III. (III.) San Martin

24A. Introduction to the History of Music I (3) 
 Lecture—3 hours. Prerequisite: course 2A (may be taken concurrently). History of music of the late Baroque to Beethoven. Intended primarily for majors in music. GE credit: ArtHum | AH, VL, WE.—II.

24B. Introduction to the History of Music II (3) 
 Lecture—3 hours. Prerequisite: course 2A, course 6B (may be taken concurrently). The history of music from the Romantic Period to the twentieth century. Intended primarily for majors in music. GE credit: ArtHum, Wrt | AH, VL, WE.—II.

24C. Introduction to the History of Music III (3) 
 Lecture—3 hours. Prerequisite: course 2B, course 6C (may be taken concurrently). The history of music of the 20th century. Intended primarily for majors in music. GE credit: ArtHum, Wrt | AH, VL, WE.—I.

28. Introduction to African American Music (4) 
 Lecture/discussion—3 hours; discussion—1 hour; listening; project. Survey of African American music, such as spirituals, blues, ragtime, jazz, theater, gospe, R&B, and rap. Emphasis on historical and sociocultural contexts, as well as African roots. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, VL, W. W.—III. (III.) Ortiz, Rohde, San Martin

101A. Advanced Theory, Part 1 (4) 
 Lecture—3 hours; lecture/laboratory—1 hour. Prerequisite: course 7C. Twentieth-century music from 1930 through 1950 and the various analytical tools pertaining to it. Works of Copland, Sessions, Schoenberg, Bartók, and Stravinsky. Composition of small pieces for piano and voice. GE credit: ArtHum | AH.—II. (II.) Craig

101B. Advanced Theory, Part 2 (4) 
 Lecture—3 hours; lecture/laboratory—1 hour. Prerequisite: course 101A. From 1950 to the present and the analytical tools pertaining to it. Works of Babbitt, Carter, Dallapiccola, Ligeti, Messiaen, Reich and others. Composition of small pieces for ensemble. GE credit: ArtHum | AH.—II. (II.) San Martin

102. Tonal Counterpoint (4) 
 Lecture—3 hours; practice—1 hour. Prerequisite: course 7C. Imitative tonal counterpoint with an analitical focus on the Two-Part Inventions and fugues from the Well-tempered Clavier by J. S. Bach. Composition of exercises and short pieces using contrapuntal techniques. Intended for music majors. GE credit: ArtHum | AH.—II. (II.) Bauer

103. Workshop in Composition (3) 
 Workshop—3 hours. Prerequisite: course 7C. Workshop in music composition for undergraduates who are interested in pursuing serious compositional studies and intending to follow the composition track of the major. Course will explore the techniques and procedures of composition in various electronic media. May be repeated for credit. GE credit: ArtHum | AH.—II. (II.) Ortiz, Rohde, San Martin

107A. Computer and Electronic Music (3) 
 Lecture—3 hours; laboratory—1 hour. Prerequisite: consent of instructor. Studies in electronic and computer music composition. The principles and procedures of composition in various electronic media are explored through compositional exercises. Limited enrollment. GE credit: ArtHum, Div, Wrt | ACGH, AH.—II. (II.) Nichols

108A-108B. Orchestration (2-2) 
 Lecture—2 hours. Prerequisite: 108A—course 7C; 108B—course 108A. Techniques of orchestration from study of basic instrumental techniques to analysis of orchestral scores and scoring for various instrumental combinations. GE credit: ArtHum | AH, VL,—III. (III.) Ortiz

121. Topics in Music Scholarship (4) 
 Seminar—4 hours. Prerequisite: courses 7C and 24C, or consent of instructor. Sources and problems of a historical period or musical style selected by the instructor and announced in advance. May be repeated for credit. GE credit: ArtHum | AH, OL.—I, II, III, (II, II.)

122. Topics in Analysis and Theory (4) 
 Seminar—4 hours. Prerequisite: course 7C and course 24C, or consent of instructor. Analysis of works of a composer or musical style selected by the instructor and announced in advance. Consideration of theoretical issues. May be repeated for credit. GE credit: ArtHum | AH, OL.—I, II, III, (II, II.)

1248. History of Western Music: 1600-1750 (3) 
 Lecture—3 hours. Prerequisite: course 124A. Historical survey of composers and musical styles from the late 1500s to the mid 18th century. GE credit: ArtHum, Wrt | AH, VL, WE.—III. Busse Berger

126. American Music (4) 
 Lecture—3 hours; listening—1 hour. Prerequisite: course 10 or 3A-3B or consent of instructor. Introductory survey of American music, including Native American music, Hispanic polyphony, New England psalody, and selected composers and styles. Offered in alternate years. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, WE.—II. Levy

127. Music from Latin America (4) 
 Lecture—3 hours; discussion—1 hour. Prerequisite: consent of instructor. Examination of music from Latin America. Characteristic forms, such as, tango, bossa nova, salsa, musica motena, musica andalou as well as its implications in other musical genres. Taught in Spanish. Not open to students who taken Spanish 171 and 171S. (Same course as Spanish 171)
Offered in alternate years. May be repeated one time for credit when topic differs. GE credit: ArtHum, AH, WC.—II, III, Baldini.

(change in existing course—eff. winter 14)

129A. Musics of the Americas (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 11 or 3A-3B. Survey of music cultures from North, Central, and South America, including the Caribbean, with emphasis on the role of music in society and on the elements of music [instruments, theory, genres and form, etc.]. Introduction to ethnomusicological theory, methods, approaches. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, DD, WC, WE.—Spitali.

(change in existing course—eff. winter 14)

132. Singing for Actors (1)
Performance—1 hour. Prerequisite: consent of instructor. The elements of basic singing techniques, through selected exercises, vocalises, and songs. May be repeated for credit. (P/NP grading only.) GE credit: AH.

(change in existing course—eff. winter 13)

141. University Symphony (2)
Rehearsal—4 hours. Prerequisite: admission subject to audition before first class meeting. Open to any student in the University whose proficiency meets the requirements of concert performance. Sight-reading, rehearsal, and performance of music from the orchestral literature. May be repeated for credit. (P/NP grading only.) GE credit: AH.—I, II, III, I, II, III, Sahai

(change in existing course—eff. winter 13)

142. University Chamber Singers (2)
Rehearsal—3 hours. Prerequisite: admission subject to audition before first class meeting. Rehearsal and performance of works for small choral groups. May be repeated for credit. (P/NP grading only.) GE credit: AH.—I, II, III, I, II, III, Thomas

(change in existing course—eff. winter 13)

143. University Concert Band (2)
Rehearsal—4 hours. Prerequisite: admission subject to audition before first class meeting. Open to any student in the University whose proficiency meets the requirements of concert performance. Rehearsal and performance of music for band. May be repeated for credit. (P/NP grading only.) GE credit: AH.—I, II, III, I, II, III, Spitali

(change in existing course—eff. winter 13)

144. University Chorus (2)
Rehearsal—4 hours. Prerequisite: admission subject to audition before first class meeting. Open to any student in the University. Rehearsal and performance of choral music. May be repeated for credit. (P/NP grading only.) GE credit: AH.—I, II, III, I, II, III, Thomas

(change in existing course—eff. winter 13)

145. Early Music Ensemble (2)
Rehearsal—4 hours. Prerequisite: admission subject to audition before first class meeting. Rehearsal and performance of Medieval, Renaissance, and Baroque music for vocal ensemble and historical instruments. May be repeated for credit. (P/NP grading only.) GE credit: AH.—I, II, III, I, II, III, Nutter

(change in existing course—eff. winter 13)

146. Chamber Music Ensemble (1)
Rehearsal—2 hours; student practice—1 hour. Prerequisite: admission subject to audition before first class meeting. Open to any student in the University whose proficiency meets the requirements of concert performance. Study, rehearsal, and performance of ensemble music for string, winds, voice, piano, harpsichord, and organ. May be repeated for credit. (P/NP grading only.) GE credit: AH.—I, II, III, I, II, III, Baldini.

(change in existing course—eff. winter 13)

147. University Wind Ensemble (2)
Rehearsal—4 hours. Prerequisite: consent of instructor. Rehearsal, study, and performance of a full variety of wind ensemble music; and to have students share their work in public performances. May be repeated for credit. (P/NP grading only.) GE credit: AH.—I, II, III, I, II, III, Nowler

(change in existing course—eff. winter 13)

148. Hindustani Vocal Ensemble (2)
Rehearsal—2 hours. Basics of Hindustani music through theory and practice. Fundamentals of raga (mode) and tala (rhythms) with special emphasis on improvisation, performance of Kyath (singing style). Five ragas each quarter. May be repeated up to six times for credit. (P/NP grading only.) GE credit: AH.—I, II, III, I, II, III, Sahai

(change in existing course—eff. winter 13)

149. Indonesian Gamelan Ensemble (2)
Rehearsal—2 hours. Prerequisite: consent of instructor. Introduction to Balinese music practice. Basic instrumental technique and repertory. Focus on two styles of Sun-danese gamelan (tuned percussion orchestras); salendro and degung. May be repeated for credit. (P/NP grading only.) GE credit: AH.—I, II, III, I, II, III, Spitali

(change in existing course—eff. winter 13)

150. Brasilian Samba School (2)
Rehearsal—2 hours. Prerequisite: consent of instructor. Practice of Brasilian music. Basic instrumental technique and repertory. Focus on the percussion traditions of Rio de Janeiro and Bahia. May be repeated up to six times for credit. (P/NP grading only.) GE credit: ArtHum | AH.—I, II, III, I, II, III, Froh

(change in existing course—eff. winter 14)

192. Internship in Music (1-4)
Internship—3-12 hours. Prerequisite: consent of instructor and academic advisor or department chairperson. For Music majors. Internship outside the university related to music. Student must submit a written proposal to an appropriate Music Department instructor. May be repeated up to eight units of credit. (P/NP grading only.) GE credit: AH.—I, II, III, I, II, III, I, II, IV, I, II, III, I, II, IV

(change in existing course—eff. winter 14)

194HA-194HB. Special Study for Honors Students (2-4)
Independent study—6-12 hours. Prerequisite: course 7C, 124B. Open only to students who qualify for the honors program and admission to Music Senior Honors Program. Preparation and presentation of a culminating project, under the supervision of an instructor, in one of the creative or scholarly areas of music. (Deferred grading only, pending completion of sequence.) GE credit: ArtHum | AH.—I, II, III, I, II, III

(change in existing course—eff. winter 13)

195. Senior Project (2)
Project—6 hours. Prerequisite: Consent of instructor and undergraduate advisor. Preparation of a senior project in music composition [public presentation of a new work], in music performance [a public recital], or in music history and theory [public presentation of research results] Restricted to music majors with senior standing. GE credit: ArtHum | AH.—I, II, III, I, II, III, I, II, III

(change in existing course—eff. winter 13)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: AH.

(change in existing course—eff. winter 13)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.) GE credit: AH.

(change in existing course—eff. winter 13)

Graduate

210C. Prosseminar in Music (Ethnomusicology) (4)
Seminar—3 hours; term paper. Introduction to ethnomusicology through its intellectual history, theoretical approaches, analytical techniques, and methodologies. I. (I.) Spiller

(change in existing course—eff. spring 13)

Native American Studies

New and changed courses in Native American Studies (NAS)

Lower Division

12. Native American/Indigenous Film (4)
Lecture—3 hours; film viewing; discussion—1 hour. Survey and analysis of the visual colonization of Native American peoples and the contemporary responses by Native American/Indigenous filmmakers claiming visual sovereignty. Examines a range of filmic genres including documentary, features, shorts, festivals, TV and internet screening. GE credit: ArtHum or SocSci | ACGH, AH or SS, DD, DL, VL, WC, WE.—Tsinhnahjinnie

(change in existing course—eff. winter 13)

33. Introduction to Native American Art (4)
Lecture—4 hours. Introduction to Native American Art from throughout North America, inclusive of traditional forms, techniques and designs in a range of media including ceramics, basketry, fiberwork, carving, painting, sculpture and photography within a context of social and political history. GE credit: ArtHum, Div | ACGH, AH or SS, DD, DL, VL, WE.—I. (I.) Tsinhnahjinnie

(change in existing course—eff. fall 12)

34. Native American Art Studio (4)
Lecture—2 hours; studio—6 hours. Prerequisite: consent of instructor; course 33 recommended. Limited enrollment. Studio projects to be influenced by contemporary and traditional Native American Arts. Examples of designs and media presented in lectures will be of indigenous origin. Introduction and familiarized with various materials and techniques. GE credit: ArtHum | ACGH, AH, DD, DL, VL, WC.—Tsinhnahjinnie

(change in existing course—eff. winter 13)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

(change in existing course—eff. winter 13)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

(change in existing course—eff. winter 13)

Upper Division

101. Contemporary Native American Art (4)
Lecture—3 hours; extensive writing. Examination of contemporary artworks by selected Native American and Indigenous Master artists, in a wide range of media, including ceramics, metal arts, photography, video, painting, installation and performance within...
125. Performance and Culture Among Native Americans (4)
Lecture—3 hours; film viewing—3 hours. Prerequisite: upper division standing in division of humanities or social sciences or consent of instructor. Interdisciplinary study of public expressive forms among Native Americans. Consideration of analysis of music, dances, rituals, and dramas from throughout North, Central, and South America in their social and cultural contexts. Not open for credit to students who have completed Music 125. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS, WC, WE. —III (III) Mendoza

107. California Indian Environmental Policy II (4)
Lecture/discussion—4 hours; term paper. Contemporary California Indian environmental policy issues, with a focus on planning, site protection, and collaborative structures. Issues will be placed within historical and political context, drawing on theories of Native environmental ethics, environmental justice, and Federal Indian law. Offered in alternate years. GE credit: ACGH, DD, SS, WE. —I (I) Middleton

108. Indigenous Languages of California (4)
Lecture/discussion—3 hours; term paper. Prerequisite: a course in Native American Studies, or Linguistics 1, or Anthropology 4. Survey of the indigenous languages of the California region: linguistic prehistory, languages at first European contact, subsequent language loss, current efforts at language and cultural revitalization, indigenous languages of recent immigrants to California. GE credit: ArtHum or SocSci | ACGH, AH or SS, DD, WE. —II (II) Mendoza

110A. Quechua Language and Society, Beginning Level I (4)
Lecture/discussion—4 hours. Introduction to Quechua language and society emphasizing the practical use of the language. Focuses on the study of Quechua language and society. Emphasis on development of conversational and reading skills. Continuation of the study of aspects of contemporary Andean society and the status of Quechua language today. Offered in alternate years. GE credit: SocSci | SS. —II. Mendoza

110B. Quechua Language and Society, Beginning Level II (4)
Lecture/discussion—4 hours. Prerequisite: course 110A and B. Third level of the teaching of Quechua language and society. Emphasis on development of conversational and reading skills. Continuation of the study of aspects of contemporary Andean society and the status of Quechua language today. Offered in alternate years. GE credit: SocSci | SS. —II. Mendoza

110C. Quechua Language and Society, Intermediate Level I (4)
Lecture/discussion—4 hours. Prerequisite: courses 110A and B. Fourth level of the teaching of Quechua language and society. Focus on development of conversational and reading skills. Continuation of study of aspects of contemporary Andean society and the status of Quechua language today. Offered in alternate years. GE credit: SocSci | SS. —II. Mendoza

110D. Quechua Language and Society, Intermediate Level II (4)
Lecture/discussion—4 hours. Prerequisite: course 110A, B and C. Fifth level of the teaching of Quechua language and society. Focus on development of conversational and reading skills. Continuation of study of aspects of contemporary Andean society and the status of Quechua language today. Offered in alternate years. GE credit: SocSci | SS. —II. Mendoza

115. Native Americans in the Contemporary World (4)
Lecture/discussion—4 hours. Prerequisite: course 1, 10. Important issues facing Native Americans in the contemporary world. Focus primarily on the diverse ways of life, histories and realities of indigenous people throughout the Americas as they develop their own cultural and political institutions. GE credit: ArtHum or SocSci, Div | AH or SS, ACGH, DD, OL, WE. —II (II) Crum

162. California Indian Environmental Policy II (4)
Lecture/discussion—4 hours; term paper. Contemporary California Indian environmental policy issues, with a focus on planning, site protection, and collaborative structures. Issues will be placed within historical and political context, drawing on theories of Native environmental ethics, environmental justice, and Federal Indian law. Offered in alternate years. GE credit: ACGH, DD, SS, WE. —III (III) Middleton

120. Native American Women (4)
Lecture/discussion—4 hours. Prerequisite: course 1, 10, or Women’s Studies 50. Native American women’s life experiences, cross-cultural comparisons of gender roles, and Native women’s contemporary feminist thought. Utilizes texts from literature, social science, and autobiography/biography. GE credit: ArtHum or SocSci | AH or SS, DD, OL, WE. —II (II) Mendoza

181C. Contemporary Native American Poetry (4)
Lecture—4 hours. Prerequisite: one of the following: course 5, English 3, Comparative Literature 1, 2, 3. Works of poetry by contemporary Native American/indigenous poets, with some attention to traditional cultural poetic expressions. GE credit: ArtHum, Div, Wrt | AH, DD, OL, WE. —IV (IV) Hernández-Avila

184. Contemporary Indigenous Literature of Mexico (4)
Lecture/discussion—4 hours. Prerequisite: course 1 or 10; course 181A or 181C recommended; reading knowledge of Spanish language required. Contemporary indigenous literature of Mexico, with a focus on the genres (poetry, fiction, drama, essay); analysis of cultural, historical, and spiritual themes, imagery, style and performance; biographies and influences on the Native writers themselves. Offered irregularly. GE credit: ArtHum or SocSci | AH or SS, OL, WC. —IV. (IV) Hernández-Avila

185. Native American Literature in Performance (4)
Performance instruction—4 hours. Prerequisite: consent of instructor. Performance of contemporary Native American literature onstage, through adaptions of selected literature as well as the creation of original pieces. Offered in alternate years. May be repeated up to four units for credit. GE credit: ArtHum or SocSci | AH, DD, OL, WC. —III (III) Hernández-Avila

188. Special Topics in Native American Literary Studies (4)
Lecture/discussion—4 hours; term paper. Prerequisite: upper division standing and one of the following recommended: course 5, 10, 181A, 181C. Special topics drawn from Native American literature. May be repeated for credit when topic differs. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, DD, OL, WE. —IV, III (IV, III) Hernández-Avila

191. Topics in Native American Studies (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Selected topics related to indigenous knowledges and worldviews from a historical, cultural, hemispheric perspective. May be repeated for credit when topic differs and/or when offered by a different instructor.
(change in existing course—eff. spring 13)

192. Internship (1-12)
Internship—1 hour. Supervised internship in the CN Garman Museum, community, and institutional set-
tings related to Native American concerns. May be repeated up to 12 units for credit including 192 and other internships taken in other departments and institutions. (P/NP grading only.) GE credit: ArtHum | AH. —I, II, III, IV, (II, III, IV, IV) Tsinnihajinnie
(change in existing course—eff. winter 13)

Nematology

New and changed courses in Nematology (NEM)

Upper Division
100. General Plant Nematology (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 18 or 10. An introduction to the classification, morphology, biology, and control of the nematodes attacking cultivated crops. GE credit: SciEng | SE. —I. (I) Ferris
(change in existing course—eff. winter 13)

110. Introduction to Nematology (2)
Lecture—2 hours. Prerequisite: Biological Sciences 18 or the equivalent or consent of instructor. The relationship of nematodes to human environment. Classification, morphology, ecology, distribution, and importance of nematodes occurring in water and soil as parasites of plants and animals. GE credit: SciEng | SE—II. (II) Caswell-Chen, Nadler
(change in existing course—eff. winter 13)

Neurobiology, Physiology, and Behavior

New and changed courses in Neurobiology, Physiology, and Behavior (NPB)

Lower Division
15. The Biology and Physiology of Aging (4)
Lecture—3 hours; discussion—1 hour. Broad exam-
ation in age-associated changes in body functions. Includes basic cell physiology, a survey of major organ systems, and the age-induced alterations in system function. Some age-associated diseases will also be examined. Not open for credit to students who have completed course 15V. GE credit: SciEng | SE. —I. (I)

15V. The Biology and Physiology of Aging (4)
Web virtual lecture—3 hours; web electronic discus-
sion—1 hour. Broad examination of the biological and physiological basis of aging in animals and plants. Concepts in demographic, evolutionary, genetic, and cell aging. Major human organ sys-
tems, age-related alterations in system function, and age-related diseases. Intended for non-science majors. Not open for credit to students who have completed course 15V. GE credit: SciEng | SE, SL—III. (III) McDonald
(change in existing course—eff. winter 13)

Upper Division
100L. Neurobiology Laboratory (3)
Lecture—1 hour; laboratory—3 hours; extensive writing or discussion. Prerequisite: course 100 (may be taken concurrently). Experimental basis of neuro-
biology principles discussed in course 100. Topics include neurophysiology, sensory systems, motor sys-
tems, cellular neuroscience, cognitive neuroscience, and quantitative techniques and modeling tech-
niques. GE credit: SciEng | SE. —I. Goldman
(new course—eff. fall 13)

101. Systemic Physiology (5)
Lecture—5 hours. Prerequisite: Biological Sciences 1A, or 2A and Chemistry 2B. Physics 1B or 7C strongly recommended. Systemic physiology with emphasis on aspects of human physiology, functions of major organ systems, with the structure of those systems described as a basis for understanding the functions. GE credit: SciEng | SE. —I, II, III, IV, (II, III, IV) Debello, Fuller, Furlow, Ishida, Lusrey, Weidner, Wingfield, Zito
(change in existing course—eff. winter 13)

124. Comparative Neuroanatomy (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: Psychology 101, or course 100 or 101. Overview of the neuroanatomy of the nervous system in a vari-
ety of mammalian and non-mammalian vertebrates. Examine changes or modifications to neural struc-
tures as a result of morphological or behavioral spe-
cializations. (Same course as Psychology 124.) GE credit: SL. —II. (II) Krueger, Rieves
(change in existing course—eff. fall 11)

159. Frontiers in Behavior (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: courses 100, 101, 102. Lectures by leading authori-
ties and discussion of the latest research in newly emerging areas in behavioral biology. Offered every fourth year. Offered irregularly. GE credit: SciEng | QL, QE
(change in existing course—eff. winter 13)

160. Molecular and Cellular Neurobiology (3)
Lecture—1.5 hours; discussion—1.5 hours. Prerequi-
site: course 100, Biological Sciences 101 and con-
sent of instructor. Selected topics in neurobiology. Topics include channel biophysics, action potential propagation, intracellular signal transmission path-
ways, synaptic physiology and quantal analysis, cell-
ular mechanisms of synaptic plasticity, and neuromodulation of synaptic circuitry. (Same course as Neuroscience 160.) GE credit: VL. —III. (III) Burns, Mulloney
(change in existing course—eff. fall 11)

161. Developmental Neurobiology (3)
Lecture—3 hours. Prerequisite: course 100 or 101. Issues, theoretical concepts, and methodologies in developmental neurobiology. Topics include prenatal and postnatal differentiation of neurons, and plastics in the mature and aging brain. Integration of neurochemical, structural, physiological and behav-
ioral perspectives. GE credit: SciEng | SE. —III. (III) McAllister
(change in existing course—eff. winter 13)

167. Computational Neuroscience (5)
Lecture—4 hours; lecture/laboratory—3 hours. Pre-
requisite: course 100 or permission of instructor; Math 17A, 17B, 17C, or equivalent; Physics 2A, B, C or equivalent strongly recommended; consent of instructor. Mathematical models and data analysis techniques used to describe computations performed by nervous systems. Lecture topics include single neuron biophysics, neural coding, network dynam-
ics, memory, plasticity, and learning. Lab topics include programming mathematical models and
data analysis techniques in MATLAB. Offered in alternate years. GE credit: SciEng | SE, QL. —(I) Goldman
(change in existing course—eff. fall 12)

Neuroscience

New and changed courses in Neuroscience (NSC)

Upper Division
160. Molecular and Cellular Neurobiology (3)
Lecture—1.5 hours; discussion—1.5 hours. Prerequi-
site: Neurobiology, Physiology, and Behavior 100, Biological Sciences 101 and consent of instructor. Selected topics in neurobiology. Topics include chan-
nel biophysics, action potential propagation, intracell-
ular signal transduction pathways, synaptic physiology and quantal analysis, cellular mecha-
nisms of synaptic plasticity, and neuromodulation of synaptic circuitry. (Same course as Neuroscience, Physiology, and Behavior 160.) GE credit: VL. —III. (III) Burns, Mulloney
(change in existing course—eff. fall 11)

Nursing, School of

New and changed courses in Nursing (NRS)

Graduate
204. Research Skills for Nursing Science and Health-Care Leadership (4)
Lecture/discussion—3 hours; laboratory/discus-
sion—1 hour. Prerequisite: current enrollment in the Nursing Science and Health-Care Leadership gradu-
ate program or consent of instructor. Foundation for analyzing research, health, and systems data to answer clinical, systems, or policy questions. Use and examine multiple sources of data and information as a basis for planned change and transforma-
tion in health care.—III. (III)
(change in existing course—eff. winter 14)

Professional
470. Health Care Ethics (3-9)
Lecture/discussion—2 hours; laboratory/discus-
sion—1 hour. Prerequisite: consent of instructor. Guided independent study of issues in biomedical ethics, with discussion of readings that are based on student interests and needs. Participation in ethics rounds. (Same course as General Medicine 470.) (S/U grading only.) —I, II, III, IV, (I, II, III, IV) Loewy
(new course—eff. spring 12)

493A. Improving Quality in Health Care (3)
Lecture—8 hours; discussion/laboratory—10 hours; project—10 hours. Prerequisite: consent of instruc-
tor. Working in interdisciplinary teams, will explore the theory and practical methods being employed to make improvement in health care systems while pro-
viding an opportunity for interprofessional educa-
tion. (Same course as General Medicine 493ASA.) (S/U grading only; deferred grading only, pending completion of sequence.) —I. (I) Bokemian, Shaikh
(new course—eff. fall 12)

493B. Improving Quality in Health Care (3)
Lecture—8 hours; discussion/laboratory—10 hours; project—10 hours. Prerequisite: consent of instruc-
tor. Working in interdisciplinary teams, will explore the theory and practical methods being employed to make improvement in health care systems while pro-
viding an opportunity for interprofessional educa-
cion. (Same course as General Medicine 493QA.) (S/U grading only.)—I, II, III, IV, (I, II, III, IV) Loewy
(new course—eff. fall 12)
fional experience. [Same course as Medical Sciences 493GCB] (S/U grading only; deferred grading only, pending completion of sequence.) II. Bakerjian, Shahik
(new course—eff. fall 12)

493C. Enhancing Patient Safety in Health Care (3)
Seminar—1 hour; clinical activity—1 hour; discussion—1 hour. Prerequisite: Nursing Science and Health Care Leadership; pending graduation students; consent of instructor. Inter-professional module is designed to explore the theory and practical methods being employed to improve patient safety in health care while providing an opportunity for inter-professional educational experience. [Same course as Medical Sciences 493GCC] (S/U grading only.) III. Bakerjian, Natele
(new course—eff. spring 13)

## Nutrition

**New and changed courses in Nutrition (NUT)**

### Lower Division

99. Individual Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.
(change in existing course—eff. winter 13)

### Upper Division

104. Environmental & Nutritional Factors in Cellular Regulation and Nutritional Toxicants (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 101; Biological Sciences 103 or Animal Biology 103. Cellular regulation from nutritional/toxicological perspective. Emphasis: role of biofactors on modulation of signal transduction pathways, role of specific organelles in organization/ regulation of metabolic transformations, major cofactor functions, principles of pharmacology/toxicology important to understanding nutrient/toxicant metabolism. [Same course as Environmental Toxicology 104.] GE credit: SciEng | OL, SE, SL.—I. (I) Haj, Olea
(change in existing course—eff. winter 13)

105. Nutrition and Aging (3)
Lecture—3 hours. Prerequisite: course 111AV and Animal Biology 103 or the equivalent. Role of nutrition in the aging process from both an organismal/cell perspective, including demographics, theories of aging, nutrition and evolution, nutritional manipulation and life-span extension, and nutrition’s impact on the diseases of aging. GE credit: SciEng | SE.—II. (III) McDonald
(change in existing course—eff. winter 13)

111AV. Introduction to Nutrition and Metabolism (3)
Web-based lecture—3 hours. Prerequisite: Chemistry 8B, Neurobiology, Physiology, and Behavior 101 or the equivalent. Introduction to metabolism of protein, fat and carbohydrate, the biological role of vitamins and minerals; nutrient requirements during the life cycle; assessment of dietary intake and nutritional status. Not open for credit to students who have completed course 101. C credit: SciEng | OL, SE, SL.—III. (III) McDonald
(change in existing course—eff. winter 13)

112. Nutritional Assessment: Dietary, Anthropometric, and Clinical Measures (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Animal Biology 102 and 103 or course 111 (may be taken concurrently). Statistics 13. Methods of human nutritional assessment, including dietary, anthropometric, biochemical and hematological techniques, and physical examination. Prerequisites: 111 or 114; approval of instructor. GE credit: SciEng | OL, SE.—III. (III) Stewart
(change in existing course—eff. winter 13)

116A. Clinical Nutrition (3)
Lecture—3 hours. Prerequisite: courses 111, 112 and Neurobiology, Physiology, and Behavior 101 or the equivalent. Biochemical and physiological bases for therapeutic diets. Problems in planning diets for normal and pathological conditions. GE credit: SciEng | SE—II, III. (II, III) Clifford, Steinberg, Stern
(change in existing course—eff. winter 13)

116AL. Clinical Nutrition Practicum (3)
Lecture—1 hour; laboratory—3 hours; discussion—1 hour. Prerequisite: 116A may be taken concurrently. Fundamental principles of planning and evaluating therapeutic diets and patient education for pathological conditions covered in 116A. GE credit: SciEng | SE—II, III. (II) Frank
(change in existing course—eff. winter 13)

116B. Clinical Nutrition (3)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 111 AL, 112 and 116A (may be taken concurrently). Fundamental principles of planning and evaluating therapeutic diets and patient education for pathological conditions covered in 116A. GE credit: SciEng | SE—II, III. (II, III, IV) Clifford, Steinberg, Stern
(change in existing course—eff. winter 13)

116BL. Clinical Nutrition Practicum (3)
Lecture—1 hour; laboratory—3 hours; discussion—1 hour. Prerequisite: courses 111 AL, 112 and 116A (may be taken concurrently). Fundamental principles of planning and evaluating therapeutic diets and patient education for pathological conditions covered in 116A. GE credit: SciEng | SE—II, III. (II, III) Clifford
(change in existing course—eff. winter 13)

117. Experimental Nutrition (6)
Lecture—3 hours; laboratory—6 hours, extensive writing. Prerequisite: courses 111, 112, Biological Sciences 102 and 103, and a laboratory course in nutrition or biochemistry. Methods of assessing nutritional status. Application of chemical, microbiological, chromatographic and enzymatic techniques to current problems in nutrition. GE credit: SciEng, Writ | SE, WE.—I. (I) Clifford, Gaitkowd
(change in existing course—eff. winter 13)

118. Community Nutrition (4)
Lecture—4 hours. Prerequisite: course 101 or 111, and 116A. Nutrition problems in contemporary communities, and of selected target groups in the United States and in developing countries. Nutrition programs and policy, principles of nutrition education. GE credit: SciEng | SE, SL.—III. (II) Heining
(change in existing course—eff. winter 13)

122. Ruminant Nutrition and Digestive Physiology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: upper division standing; Animal Biology 103 or consent of instructor; Neurobiology, Physiology, and Behavior 101, Biological Sciences 1C, and Mathematics 168 recommended. Study of nutrient utilization as influenced by the unique aspects of digestion and fermentation in ruminants, both domestic and wild. Laboratories include comparative anatomy, food evaluation, digestion kinetics using fistulated cows, computer modeling, and microbial exercises. GE credit: SciEng | OL, SE, SL.—III. (II) Zidenberg-Cherr
(change in existing course—eff. winter 13)

123. Comparative Animal Nutrition (3)
Lecture—3 hours. Prerequisite: Animal Biology 103. Restricted to upper division or graduate students. Comparative nutrition of animals; including labora-

### Quarter Offered:
I. Fall, II. Winter, III. Spring, IV. Summer 2013-2014 offering in parentheses.
Pre-Fall 2011 General Education (GE) requirements: AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; AGCH—American Cultures, DD—Domestic Diversity; Wrt—Writing Experience Fall 2011 and on General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; AGCH—American Cultures, DD—Domestic Diversity; OL—Oral Skills, QL—Quantitative, SL—Scientific, VL—Visual, WC—World Cultures, WE—Writing Experience

2012-2014 General Catalog Course Supplement and Policies and Requirements Addendum
Nutritional Biology (A Graduate Group)

New and changed courses in Nutritional Biology (NUB) Graduate

290C. Research Group Conference (1)
Discussion—1 hour. Prerequisite: research assistant. Seminar conference on research problems, progress and techniques in animal sciences. May be repeated for credit. (S/U grading only).—I, II, III. (I, II, III.) (new course—eff. fall 12)

298. Directed Group Study (1-5)
Prerequisite: graduate standing in Nutritional Biology Graduate Group, or consent of instructor. May be repeated three times for credit when topics differ and consent of instructor.—I, II, III. (I, II, III.) (new course—eff. fall 13)

299. Research (1-12)
Prerequisite: consent of instructor. May be repeated for credit. (S/U grading only).—I, II, III. (I, II, III.) (new course—eff. fall 13)

Performance Studies

New and changed courses in Performance Studies (PFS)
Graduate

200. Methods and Materials in Theatre Research (4)
Seminar—3 hours; term paper. Essential research tools in theatre and related fields; bibliographies, primary sources; methods of evaluating and presenting evidence; delineating research areas in the field.—I. (I.) (new course—eff. fall 12)

259. Topics in Contemporary Theatre and Performance (4)
Seminar—3 hours; term paper. Special topics designed to study in depth aspects of contemporary performance including performance analysis, cultural and historical context, modes of production, theoretical and political entailments, and issues of spectatorship; e.g., “Brecht and After,” “British Theater,” “Race and Gender in Performance.” May be repeated five times for credit. —I, II, III. (I, II, III.) (new course—eff. fall 12)

265A. Performance Studies: Modes of Production (4)
Seminar—3 hours; term paper. Introduction to the literature of performance production in a variety of media: theatre, dance, film, video, computer-based, looking at cultural, aesthetic, rhetorical and political theory. May be repeated three times for credit when topics differ. Offered in alternate years. (new course—eff. fall 12)

265B. Performance Studies: Signification and the Body (4)
Seminar—3 hours; term paper. Introduction to analysis of the body in performance, drawing on theoretical models from several fields. May be repeated three times for credit when topics differ. Offered in alternate years. (new course—eff. fall 12)

265C. Performance Studies: Performance and Society (4)
Seminar—3 hours; term paper. Introduction to the role of performance (broadly defined), in everyday life, sociopolitical negotiation, identity, social movements, the media, and the state. May be repeated three times for credit when topic differs. Offered in alternate years. (new course—eff. fall 12)

265D. Performance Studies: Theory, History, Criticism (4)
Seminar—3 hours; term paper. Introduction to the theory, history and criticism, informing performance studies. May be repeated three times for credit when topics differ. Offered in alternate years. (new course—eff. fall 12)

260. Colloquia in Performance Studies (4)
Lecture/discussion—2 hours; discussion/laboratory—1 hour; term paper. Prerequisite: registration in Performance Studies Graduate Group and prior to Qualifying Examination. Designed to provide cohort identity and faculty exchange. Opportunity to present papers, hear guest lecturers, and see faculty presentations, gather for organizational and administrative new, exchange of information and make announcements. Course must be taken every year that a Performance Studies graduate is registered, prior to taking the Qualifying Examination. May be repeated four times for credit. Limited to four units per year. (S/U grading only).—III. (III.) (new course—eff. fall 12)

298. Group Study (1-5)
Independent study. Prerequisite: consent of instructor. —I, II, III. (I, II, III.) (new course—eff. fall 12)

299. Individual Study (1-12)
Prerequisite: consent of instructor and Advancement to Candidacy. May be repeated for credit. (S/U grading only).—I, II, III. (I, II, III.) (new course—eff. fall 12)

299D. Dissertation Research (1-12)
Prerequisite: consent of instructor and Advancement to Candidacy. May be repeated for credit. (S/U grading only).—I, II, III. (I, II, III.) (new course—eff. fall 12)

Personal Accountancy

New and changed courses in Personal Accountancy (ACC) Graduate

201. Financial Reporting (4)
Lecture—4 hours. Restricted to Master of Professional Accountancy graduate students. Coverage includes the fundamentals of accounting and reporting economic events and transactions. Emphasizes the preparation of balance sheets, income statements, statements of cash flow, and statements of stockholders’ equity. (new course—eff. fall 12)

Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to graduate students in the Graduate School of Management. Focuses on the Preparation of complex financial statements. Topics include accounting recognition, measurement, and disclosure, as well as the theoretical foundations of and motivations for financial reporting choices. —II. (II.) (new course—eff. winter 13)

205. Advanced Financial Reporting (4)
Lecture—4 hours. Prerequisite: course 203. Restricted to graduate students in the Graduate School of Management. Advanced treatment of recognition, measurement, and disclosure including pensions, accounting for income taxes, mergers and acquisitions, consolidations, special purpose entities, and foreign subsidiaries. Includes accounting for governmental and nonprofit entities, as well as advanced treatment of international accounting standards. —III. (III.) (new course—eff. winter 13)

211. Tax Reporting and Analysis (4)
Lecture—4 hours. Restricted to Master of Professional Accountancy graduate students. Introduction to the taxation of business entities and their related transactions, with an emphasis on the details of tax law and tax reporting requirements. Topics include individual, partnership, and corporate taxation, as well as tax planning. Open not for credit to students who have completed Management 264. —I. (I.) (new course—eff. fall 12)

213. Intermediate Tax Reporting and Analysis (4)
Lecture—4 hours. Prerequisite: course 211 or Management 264. Restricted to graduate students in the Graduate School of Management. Detailed analysis of federal taxation of individuals. Topics include the timing of income recognition, deductions and credits for tax purposes, as well as the basics of property transactions. —II. (II.) (new course—eff. winter 13)

215. Advanced Tax Reporting and Analysis (4)
Lecture—4 hours. Prerequisite: course 213. Restricted to graduate students in the Graduate School of Management. Advanced treatment of complex tax transactions and entities. Topics include aspects of federal taxation of entities and the applicable impact upon individual taxpayers. Coverage includes basis analysis as applicable to pass through entities and an introduction to professional responsibilities. —III. (III.) (new course—eff. spring 13)

217. Taxation of Individuals, Property, and Estates (4)
Lecture—4 hours. Prerequisite: course 213. Restricted to graduate students in the Graduate School of Management. In-depth analysis of individual income tax issues and property transactions including non-taxable exchanges, compensation, gifts, and transfer taxes. Expanded analysis of multi-state tax issues. Emphasis is on the interrelationships of complex individual transactions as well as planning techniques. —III. (III.) (new course—eff. spring 13)

219. Taxation of Business Entities (4)
Lecture—4 hours. Prerequisite: course 213. Restricted to graduate students in the Graduate School of Management. Analysis of detailed business entity tax issues including basis calculations, alternative minimum taxation, multistate and multinationa tax implications, stock transactions, and mergers and acquisitions. Tax planning for entities and relationships between business entities and their owners. Offered irregularly. —III. (III.) (new course—eff. spring 13)

231. Analysis and Use of Accounting Reports (4)
Lecture—4 hours. Prerequisite: course 203. Restricted to graduate students in the Graduate School of Management. Evaluation of complex financial accounting reports by managers and persons outside the firm, such as investors, creditors, and financial analysts. Topics include cash flow vs. income measurement, ratio and valuation analysis, and the effects of international accounting standards. Not open for credit to students who have completed Management 272. —III. (III.) (new course—eff. spring 13)

241. Auditing and the Accounting Profession (4)
Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to Graduate School of Management students. Introduction to the audit envi...
243. Auditing and Attestation Services (4)
Lecture—4 hours. Prerequisite: course 241.
Restricted to graduate students in the Graduate School of Management. Advanced treatment of the audit process and environment. Topics include audit planning and performance, evidence, internal controls, professional standards, and audit reports. Reviews, compilations and attestation services are examined, as are governmental agency audits.—III. (III.)
(new course—eff. fall 12)

251. Managerial Accounting and Controls (4)
Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to graduate students in the Graduate School of Management. Analysis of management accounting systems including cost accounting, performance measurement, and compensation and reward systems. Focuses on the production of information useful for managerial decision-making, as well as the design of these systems. Not open for credit to students who have completed Management 271.—II. (II.)
(new course—eff. winter 13)

253. Accounting Information and Control Systems (4)
Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to graduate students in the Graduate School of Management. Analysis of information systems used for accounting, record-keeping, and control. Topics include the regulatory requirements of accounting control systems as well as their implementation and auditing considerations.—III. (III.)
(new course—eff. spring 13)

261. Communications for Professional Accountants (4)
Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to graduate students in the Graduate School of Management. Overview of written and oral professional communications with an emphasis on structuring and documenting audits and reports, understanding audiences (investors, creditors, regulators, and other stakeholders), and consideration of ethical and regulatory responsibilities.—II. (II.)
(new course—eff. winter 13)

271. Accounting Ethics (4)
Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to graduate students in the Graduate School of Management. Analysis of behavioral foundations of ethics in a business environment, professional standards, the accounting profession, and the professional responsibilities of accountants. Integrates audit topics across the areas of financial, cost, tax and systems accounting. (S/U grading only.)—I. (I.)
(new course—eff. fall 12)

7. Philosophical Perspectives on Sexuality (3)
Lecture—3 hours. Philosophical issues related to sexuality, including, but not limited to, ethical and social issues regarding sexual practice, orientation, classification and identity. GE credit: ArtHum | AH.—II. (II.) Sennet
(new course—eff. winter 13)

120. Sport in American Society (3)
Lecture—3 hours. Sociological approaches to the study of sport and contemporary American culture, including sport interaction with politics, economics, religion, gender, race, media and ethics. Socialization factors involving youth, scholastic, collegiate, and Olympic sport. (Same course as Exercise Biology 120.) GE credit: SocSci, Div | SS.—II. IV. (II, IV) Saltinsky
(new course—fall 11)

1. Principles of Physics (3)
Lecture—3 hours. Prerequisite: trigonometry or consent of instructor. Mechanics. Introduction to general principles and analytical methods used in physics with emphasis on applications in applied agricultural and biological sciences and in physical education. Not open to students who have received credit for course 7B, or 9A. GE credit: SciEng | SE.—I. (I.)
(change in existing course—eff. winter 13)

1B. Principles of Physics (3)
Lecture—3 hours. Prerequisite: course 1A or 9A. Continuation of course 1A. Heat, optics, electricity, modern physics. Not open for credit to students who have received credit for course 2A, 7B, 7C, 9B, 9C, or 9D. GE credit: SciEng | SE.—II. (II.)
(change in existing course—eff. winter 13)

7A. General Physics (4)
Lecture—1.5 hours, discussion/laboratory—5 hours. Prerequisite: completion or concurrent enrollment in Mathematics 168, 178, or 218. Introduction to general principles and analytical methods used in physics for students majoring in a biological science. Only two units of credit allowed to students who have completed course 15A or 95. GE credit: SciEng | SE.—I, II, III, (I, II, III)
(change in existing course—eff. winter 13)

7B. General Physics (4)
Lecture—1.5 hours; discussion/laboratory—5 hours. Prerequisite: course 7A. Continuation of course 7A. Only two units of credit allowed to students who have completed course 7B or 1A. GE credit: SciEng | SE.—I, II, III, (I, II, III)
(change in existing course—eff. winter 13)

7C. General Physics (4)
Lecture—1.5 hours; discussion/laboratory—5 hours. Prerequisite: course 7B. Continuation of course 7B. Only two units of credit allowed to students who have completed course 7C or 9C. GE credit: SciEng | SE.—I, II, III, (I, II, III)
(new course—eff. winter 13)

9A. Classical Physics (5)
Lecture—3 hours; laboratory—2.5 hours; discussion—1 hour. Prerequisite: Mathematics 21B. Introduction to general principles and analytical methods used in physics for physics, science and engineering majors. Classical mechanics. Only two units of credit to students who have completed course 1A or 7B. Not open for credit to students who have completed course 9HA. GE credit: SciEng | SE.—I, II, III, (I, II, III)
(new course—eff. winter 13)

9B. Classical Physics (5)
Lecture—3 hours; laboratory—2.5 hours; discussion—1 hour. Prerequisite: course 9A, Mathematics 21C, 21D (may be taken concurrently). Continuation of course 9A. Fluid mechanics, thermodynamics, wave phenomena, optics. Only 2 units of credit to students who have completed course 7A. Not open for credit to students who have completed course 9HB, 9HC, or Engineering 105. GE credit: SciEng | SE.—I, II, III, (I, II, III)
(new course—eff. winter 13)

9C. Classical Physics (5)
Lecture—3 hours; laboratory—2.5 hours; discussion—1 hour. Prerequisite: course 9C and Mathematics 22A; Mathematics 22B recommended (may be taken concurrently). Introduction to physics concepts developed since 1900. Special relativity, quantum mechanics, atoms, molecules, condensed matter, nuclear and particle physics. Not open for credit to students who have completed course 9HB, 9HC, or 9HE. GE credit: SciEng | SE.—I, II, III, (I, II, III)
(new course—eff. winter 13)

9D. Modern Physics (4)
Lecture—3 hours; discussion—1.5 hours. Prerequisite: course 9C and Mathematics 22A; Mathematics 22B recommended (may be taken concurrently). Continuation of course 9C. Nuclear and particle physics. Only 2 units of credit to students who have completed course 9HD. GE credit: SciEng | SE.—I, II, III, (I, II, III)
(new course—eff. winter 13)

9HA. Honors Physics (5)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: Mathematics 21B (may be taken concurrently) or consent of instructor. Classical mechanics. Same material as course 9A in greater depth. For students in physical sciences, mathematics, and engineering. Only 2 units of credit to students who have completed course 7B. Not open for credit to students who have completed course 9HA or 9A. GE credit: SciEng | SE.—I. (I.)
(change in existing course—eff. winter 13)

9HB. Honors Physics (5)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: Physics 9HA or 9A, Mathematics 21C (may be taken concurrently). Special relativity, ther-
104B. Computational Methods of Mathematical Physics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 104A with grade C– or better and course 105A or consent of instructor. An introduction to the use of computational techniques to solve the mathematical problems that arise in advanced physics courses, complementing the analytical approaches emphasized in course 104A. GE credit: SciEng | SE.—I. (I.)
(change in existing course—eff. winter 13)

105A-105B. Analytical Mechanics (4-4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 9B, 9C, 9D and Mathematics 21D, 22A, and 22B passed with grade C– or better, or consent of department; course 104A and 105A passed with a grade of C– or better or consent of department required for 105B. Principles and applications of Newtonian mechanics; introduction to Lagrange's and Hamilton's equations. GE credit: SciEng | SE.—I. (I.)
(change in existing course—eff. winter 13)

105C. Continuum Mechanics (4)
Lecture—3 hours. Prerequisite: course 104A and 105A passed with a grade of C– or better, or consent of department. The continuum hypothesis and limitations, tensors, isotropic constitutive equations, and wave propagation. Applications such as elastic solids, heat flow, ocean waves, and acoustics. Not offered every year. GE credit: SciEng | SE.—II. (II.)
(change in existing course—eff. winter 13)

12. Visualization in Science (3)
Lecture—3 hours. Class size limited to 20-50 students. Production, interpretation, and use of images in physics, astronomy, biology, and chemistry as scientific evidence and for communication of research results. GE credit: SciEng | SE, VL.—I. (I.)
(change in existing course—eff. winter 13)

49. Supplementary Work in Lower Division Physics (1-3)
Students with partial credit in lower division physics courses may, with consent of instructor, complete the credit under this heading. May be repeated for credit. GE credit: SciEng | SE.—I, II, III, (I, II, III)
(change in existing course—eff. winter 13)

90X. Lower Division Seminar (2)
Seminar—2 hours. Prerequisite: lower division standing and consent of instructor. Examination of a special topic in Physics through shared readings, discussions, written assignments, or special activities such as laboratory work. May be repeated for credit. Limited enrollment. GE credit: SciEng | SE.
(change in existing course—eff. winter 13)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor; primarily for lower division students. (P/NP grading only.) GE credit: SciEng | SE.
(change in existing course—eff. winter 13)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only) GE credit: SciEng | SE.
(change in existing course—eff. winter 13)

Upper Division

102. Computational Laboratory in Physics (1)
Lecture—4 hours. Prerequisite: Mathematics 21D, 22A/B; Computer Science Engineering 30; course 9D or 9HD; course 104A concurrently. Introduction to computational physics and to the computational resources of the department. Preparation for basic programming assignments required in other upper division physics classes. Not open to students who have completed course 104B or 105AL. GE credit: SciEng | S 92 | SE.—I. (I.)
(change in existing course—eff. winter 13)

112. Thermodynamics and Statistical Mechanics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 115A or the equivalent. Introduction to classical and quantum statistical mechanics and their connections with thermodynamics. The theory is developed for the ideal gas model and simple magnetic models and then extended to studies of solids, quantum fluids, and chemical equilibria. GE credit: SciEng | SE.—I. (I.)
(change in existing course—eff. winter 13)

115A. Foundation of Quantum Mechanics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 104A and 105A passed with a grade of C– or better, or consent of department. Introduction to the methods of quantum mechanics with applications to atomic, molecular, solid state, nuclear and elementary particle physics. Extensive problem solving. GE credit: SciEng | SE.—III. (III.)
(change in existing course—eff. winter 13)

115B. Applications of Quantum Mechanics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 115A and Mathematics 228 or consent of instructor. Applications of quantum mechanics to nuclei, hyperfine structure, and measurements in nuclear and particle physics. Experimental and theoretical study of important analog electronic circuits. Linear circuits, transmission lines, input impedance, feedback, amplifiers, oscillators, noise. GE credit: SciEng | SE, VL.—I. (I.)
(change in existing course—eff. winter 13)

116A. Electronic Instrumentation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 115A and Math 228 or consent of instructor. Introduction to the use of digital electronics and microcomputers in experimental physics. Nonlinear electronics, integrated circuits, analog-to-digital and digital-to-analog converters, transducers, actuators. GE credit: SciEng | SE.—II. (II.)
(change in existing course—eff. winter 13)

116B. Electronic Instrumentation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 9C or 9HD or consent of instructor. Continuation of course 116A. Introduction to the use of digital electronics and microcomputers in experimental physics. GE credit: SciEng | SE.—II. (II.)
(change in existing course—eff. winter 13)

116C. Introduction to Computer-Based Experiments in Physics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 9D or 9HD, 116B, Mathematics 228 or consent of instructor. Introduction to techniques for making physical measurements using computer-based instrumentation. GE credit: SciEng | SE, WE.—III. (III.)
(change in existing course—eff. winter 13)

122A. Advanced Laboratory in Condensed Matter Physics (4)
Laboratory—8 hours. Prerequisite: course 115A or consent of the department. Experimental techniques and measurements in solid-state physics. Student performs three to six experiments depending on difficulty. Individual work is stressed. Thorough write-ups of the experiments are required. GE credit: SciEng | SE, WE.—II, III, (I, II, III)
(change in existing course—eff. winter 12)

122B. Advanced Laboratory in Particle Physics (4)
Laboratory—8 hours. Prerequisite: course 115A or consent of the department. Experimental techniques and measurements in nuclear and particle physics. Students perform three to six experiments depending on difficulty.
black holes, neutron stars and white dwarfs and the theory of stars, with equal emphasis on both the
formation of substellar masses. Offered in alternate years. GE credit: SciEng | SE.—(II.) Becker, Boeshaar
(change in existing course—eff. winter 13)
152. Galactic Structure and the Interstellar Medium (4)
Lecture—3 hours; project. Prerequisite: courses 9A, B, C, D and 105A concurrently or consent of instruc-
tor. The structure, contents, and formation of our Milky Way Galaxy, including the nature of the interstellar medium, stellar populations, rotation curves, mass determination and evidence of dark matter. Offered in alternate years. GE credit: SciEng | SE.—(II.) Boeshaar, Tyson
(change in existing course—eff. winter 13)
153. Extragalactic Astrophysics (4)
Lecture—3 hours; project. Prerequisite: courses 9A, B, C, D, 104A and 105A or consent of instructor. Structure and evolution of galaxies and clusters of galaxies, including distance and mass determination, galaxy types and environments, active galactic nuclei and quasars, gravitational lensing and dark matter, global cosmological properties. Not open to students who have completed course 127. Offered in alternate years. GE credit: SciEng | SE.—(II.) Fassnacht
154. Astrophysical Applications of Physics (4)
Lecture—3 hours; project. Prerequisite: course 105AB, 110A, 105A concurrently, 112 or consent of instructor. Applications of classical and quantum mechanics, thermodynamics, statistical mechanics, and electricity and magnetism to astrophysical settings such as the Big Bang, degenerate white dwarf and neutron stars, and solar neutrinos. Not open to students who have completed this course previously as course 198. Offered in alternate years. GE credit: SciEng | SE.—(II.) Knox
(change in existing course—eff. winter 13)
155. General Relativity (4)
Lecture—3 hours; project. Prerequisite: course 104A and 105A; 105B and 110A or consent of instructor. Definition of the mathematical framework for the description of the gravitational field, introduction of the dynamical equations of Einstein governing its evolution and review of the key solutions, including black holes and expanding universes. Offered in alternate years. GE credit: SciEng | SE.—(II.) Kalo-
per (change in existing course—eff. winter 13)
156. Introduction to Cosmology (4)
Lecture—3 hours; project. Prerequisite: course 104A and 105A; 105B and 110A or consent of instructor. Contemporary knowledge regarding the origin of the universe, including the Big Bang and nucleo-
synthesis, microwave background radiation, formation of cosmic structures, cosmic inflation, cosmic acceleration and dark energy. Offered in alternate years. Not open to students who have completed course 126. GE credit: SciEng | SE.—(II.) Albrecht
(change in existing course—eff. winter 13)
157. Astronomy Instrumentation and Data Analysis Laboratory (4)
Lecture—2 hours; project—4 hours; laboratory—2 hours; project. Prerequisite: courses 9A, B, C, D. Experimental tech-
niques, data acquisition and analysis involving stellar, nebular and galaxy digital imaging, photom-
yometry and spectroscopy. Analyzing time resolved changes in the solar atmosphere in the light of hydrogen alpha. Offered in alternate years. GE credit: SciEng | SE.—(II.) Boeshaar, Tyson
(change in existing course—eff. winter 13)
158. Environmental Physics and Society (3)
Lecture—3 hours. Prerequisite: course 9D or 7C; or course 10 18 or 18B, Mathematics 168 or the equiv-
alent. Impact of humankind on the environment will be discussed from the point of view of physical
sciences. Calculations based on physical principles will be made, and the resulting policy implications will be considered. (Same course as Engineering 160.) GE credit: SciEng or SocSci | SE or SL.—III. (III)
(change in existing course—eff. fall 11)
185. Alumni Seminar Series (1)
Seminar—1 hour. Weekly guest speakers (usually a physics alumni or alumna) tell students about their careers. Speakers use their experience to give students valuable perspectives on life after a degree in physics. May be repeated two times for credit. (P/NP grading only.) GE credit: SciEng | SE.—III. (III)
(new course—eff. fall 13)
190. Careers in Physics (1)
Seminar—2 hours. Overview of important research areas in physics, discussions of research opportuni-
ties and internships, strategies for graduate school and industrial careers, the fellowship and assistant-
ship selection process, preparation of resumes, personal statements, and letters of recommendation. Physics and Applied Physics majors only. (P/NP grading only.) GE credit: SE.—I. (I)
(change in existing course—eff. winter 13)
194HA-194HB. Special Study for Honors Students (4-4)
Independent study—12 hours. Prerequisite: consent of instructor required. Open only to Physics and Applied Physics majors who satisfy the College of Letters and Science requirements for entrance into the Honors Program. Independent research project at a level significantly beyond the normal physics curriculum. (Deferred grading only, pending completion of sequence). GE credit: SciEng | SE
(change in existing course—eff. winter 13)
197. Tutoring in Physics and Astronomy (1-5)
Tutoring of students in lower division courses. Leading of small voluntary discussion groups affiliated with one of the department’s regular courses. Weekly meeting with instructor (P/NP grading only). GE credit: SE.—I, II, III. (I, II, III)
(change in existing course—eff. winter 13)
198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.
(change in existing course—eff. winter 13)
199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.) GE credit: SE.
(change in existing course—eff. winter 13)
Graduate
270. Current Topics in Physics Research (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing in Physics or consent of instructor. Reading and discussion to help physics graduate students develop and maintain familiarity with the current and past literature in their immediate field of research and related areas. May be repeated for credit. (S/U grading only)—I, II, III, (I, II, III)
(change in existing course—eff. fall 13)
292. Seminar in Elementary Particle Physics (1)
(canceled course—eff. winter 10)
Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2013-2014 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum-Arts and Humanities, SciEng-Science and Engineering, SocSci-Social Sciences; ACGH-American Cultures, DD-Domestic Diversity; Writ-Writing Experience
Fall 2011 and on General Education (GE): AH-Arts and Humanities, SE-Science and Engineering, SS-Social Sciences; ACGH-American Cultures, DD-Domestic Diversity, OL-Dental Skills, OL-Quantitative, SL-Scientific, VL-Visual, WC-World Cultures, Writ-Writing Experience
### Plant Biology

**New and changed courses in Plant Biology (PLB)**

**Upper Division**

102. California Floristics (5)
- Lecture—3 hours; laboratory—8 hours. Prerequisite: Plant Sciences 2, Biological Sciences 1C, 2C, or equivalent course in Plant Sciences. Survey of the flora of California, emphasizing recognition of important vascular plant families and genera and use of systematic keys for species identification. Current understanding of relationships among families. Principles of plant taxonomy and phylogenetic systematics. One Saturday field trip. (Same course as Plant Sciences 102.) GE credit: SciEng | SE, VL. — Ill. (III.) Potter

(change in existing course—eff. winter 13)

119. Population Biology of Invasive Plants and Weeds (3)
- Lecture—2 hours; laboratory—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C; introductory statistics recommended. Origin and evolution of invasive plant species and weeds, reproduction and dispersal, seed ecology, modeling of population dynamics, interactions between invasive species, native species, and crops, biological control. Laboratories emphasize design of competition experiments and identification of weedy species. (Same course as Evolution and Ecology 119.) GE credit: SciEng | SE. — Ill. (III.) Reimann

(change in existing course—eff. winter 13)

126. Plant Biochemistry (3)
- Lecture—3 hours. Prerequisite: Biological Sciences 103 or 105. The biochemistry of important plant processes and metabolic pathways. Discussion of methods used to understand plant processes, including use of transgenic plants. (Same course as Molecular and Cellular Biology 126.) GE credit: SciEng | SE, SL. — II. (II.) Callis, Tian

(change in existing course—eff. winter 13)

143. Evolution of Crop Plants (4)
- Lecture—3 hours; discussion—1 hour. Prerequisite: Plant Sciences 2 or Biological Sciences 1C or 2C. Origins of crops and agriculture, including main methodologies, centers of crop biodiversity, dispersal of crops, genetic and physiological differences between crops and their wild progenitors, agriculture practiced by other organisms, and role and ownership of crop biodiversity. GE credit: SciEng or SciSoc, Div, Wrt | SE or SS, SL, WE. — Ill. (III.) Gepts

(change in existing course—eff. fall 11)

148. Introductory Mycology (4)
- Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1A, 1B, 1C. Systematics, ecology, evolution, and morphology of fungi. Importance of fungi to humans. (Same course as Plant Pathology 148.) GE credit: SE. — I. MacDonald, Rizzo

(change in existing course—eff. fall 13)

**Professional**

396. Teaching Assistant Training Practicum (1-4)
- Prerequisite: graduate standing; consent of instructor. Practical experience in acting as teaching assistant in Plant Biology courses. Learning activity: hands on experience in preparing for and conducting discussions, guiding student laboratory work, and the formulation of questions and topics for examinations. May be repeated for credit. (SU grading only.)—I, II, III, IV. (I, II, III, IV)

(new course—eff. fall 13)

(change in existing course—eff.

### Plant Pathology

**New and changed courses in Plant Pathology (PLP)**

**Upper Division**

148. Introductory Mycology (4)
- Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1A, 1B, 1C. Systematics, ecology, evolution, and morphology of fungi. Importance of fungi to humans. (Same course as Plant Pathology 148.) GE credit: SE. — I. MacDonald, Rizzo

(change in existing course—eff. winter 13)

### Plant Sciences

**New and changed courses in Plant Sciences (PLS)**

**Lower Division**

1. Agriculture, Nature and Society (3)
- Lecture—2 hours; discussion/labouratory—1 hour. Multiple perspectives and connections between natural sciences, social sciences, and agriculture. Emphasizes agriculture's central position between nature and society and its key role in our search for a productive, lasting and hospitable environment. Several full-period field trips provide hands-on learning. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 1. (Former Course Agricultural Management and Rangeland Resources 1.) GE credit: SciEng | SE. — I. (I.) Gradziel

(change in existing course—eff. winter 13)

2. Botany and Physiology of Cultivated Plants (4)
- Lecture—3 hours; discussion/labouratory—3 hours. Prerequisite: high school course in biology and chemistry recommended. A holistic introduction to the underlying botanical and physiological principles of cultivated plants and their response to the environment. Includes concepts behind plant selection, cultivation, and utilization. Laboratories include discussion and interactive demonstrations. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 2. (Former course Agricultural Management and Rangeland Resources 2.) GE credit: SciEng | SE, SL. — II. (II.) Salvet, Marrush

(change in existing course—eff. winter 13)

5. Plants for Garden, Orchard and Landscape (2)
- Lecture—1 hour; laboratory—3 hours. Prerequisite: for non-majors. Hands-on experience with plants cultivated for food, aesthetic enhancement and personal satisfaction. Topics include establishing a vegetable garden, pruning and propagation activities, growing flowers and ornamental plants, and the role of plants in human health and well-being. Not open for credit to students who have completed Plant Sciences 1 or Plant Sciences 2. (Former course Plant Biology 1.) GE credit: SciEng | SE. — I, III, (I, III) Marrush

(change in existing course—eff. winter 13)

12. Plants and Society (4)
- Lecture—3 hours; extensive writing—3 hours. Prerequisite: high school biology. Dependence of human societies on plant and plant products. Plants as resources for food, fiber, health, enjoyment and environmental services. Sustainable uses of plants for food, fiber, health, enjoyment, and environmental conservation. Global population growth and future food supplies. Not open for credit to students who have completed Plant Biology 12. (Former course Plant Biology 12.) (Same course as Science and Society 12.) GE credit: SciEng or SocSci, Div, Wrt | SE or SS, WE. — I, III, (I, III, III.) Drakakaki, Fischer, Jasieniuk, Tian

(change in existing course—eff. fall 11)

15. Introduction to Sustainable Agriculture (4)
- Lecture—3 hours; laboratory—3 hours. Multidisciplinary introduction to agricultural sustainability with a natural sciences emphasis. Sustainability concepts and perspectives. Agricultural evolution, history, resources and functions. Diverse agricultural systems and practices and their relative sustainability. Laboratories provide direct experience with selected agricultural practices and systems. GE credit: SciEng | SE. — III. (III.) Van Horn, Williams

(change in existing course—eff. winter 13)

21. Application of Computers in Technology (3)
- Lecture—2 hours; laboratory/discussion—2 hours. Prerequisite: high school algebra. Concepts of computing and applications using personal computers, spreadsheets, database management, word processing and communications. Not open for students who have completed Agricultural Management and Rangeland Resources 21. (Former course Agricultural Management and Rangeland Resources 21.) GE credit: SciEng | SE, VL. — I, II, III, (I, II, III) Lieth

(change in existing course—eff. winter 13)

49. Organic Crop Production Practices (3)
- Lecture—1 hour; discussion—1 hour; laboratory—3 hours. Principles and practices of organic production of annual crops. Including organic crops, soil, and pest management, cover cropping, composting, seeding, transplanting, irrigation, harvesting and marketing. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 49. (Former course Agricultural Management and Rangeland Resources 49.) (P/NP grading only.) GE credit: SE. — I, III. (III,) Van Horn

(change in existing course—eff. winter 13)

### Upper Division

100A. Metabolic Processes of Cultivated Plants (3)
- Lecture—3 hours. Prerequisite: course 2 or Biological Sciences 1C or consent of instructor. Principles of energy capture and photosynthesis, water use, and nutrient cycling. Conversion of these resources into products (carbohydrates, proteins, lipids, and other chemicals) by plants. Exploring the relationships between environmental resources, plant metabolism and plant growth. GE credit: SciEng | SE. — I. (I,) Fischer, Zakharov

(change in existing course—eff. winter 13)

100AL. Metabolic Processes of Cultivated Plants Laboratory (2)
- Lecture/discussion—3 hours. Prerequisite: course 100A or the equivalent (may be taken concurrently). Techniques and instruments used to study plant metabolic processes, including water relations, respiration, photosynthesis, enzyme kinetics, microscopy, immunohistochemistry, and nitrogen fixation. Quantitative methods, problem solving, and practical applications are emphasized. GE credit: SciEng | SE. — I. (I,) Blumwald

(change in existing course—eff. winter 13)

100B. Growth and Yield of Cultivated Plants (3)
- Lecture—3 hours. Prerequisite: course 100A or consent of instructor. Principles of the cellular mechanisms and hormonal regulation underlying plant growth, development, and reproduction. Emphasis on how these processes contribute to the increase crop productivity and quality. GE credit: SciEng | SE. — II, (II,) Bradford, Labavitch, Salvet

(change in existing course—eff. winter 13)
100BL. Growth and Yield of Cultivated Plants Laboratory (2) Lecture—2 hours; laboratory—3 hours. Prerequisite: course 100B or equivalent. GE credit: SciEng | SE—III. (III.) Al-Khatib, Flint

100CL. Environmental Interactions of Cultivated Plants (3) Lecture—3 hours. Prerequisite: course 100A or consent of instructor. Principles of plant interactions with their physical and biological environments and their acquisition of the resources they need for growth and reproduction. Emphasis on how management practices and environmental conditions affect crop productivity. GE credit: SciEng | SE—III. (III.) Shapell

101. Agriculture and the Environment (3) Lecture—3 hours. Prerequisite: course 2 or consent of instructor. Interaction between agriculture and the environment. Focus on the interaction between agriculture and the environment to address the principles required to analyze conflict and develop solutions to complex problems facing society. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 101. (Former course Agricultural Management and Range Resources 101.) GE credit: SciEng | SE—II. (II.) Tate, Van Kessel


105. Concepts in Pest Management (3) Lecture—2 hours; laboratory/discussion—3 hours. Prerequisite: Biological Sciences 1C or course 2, Chemistry 68B. Introduction to the ecological principles of pest management and biology of different classes of pests and the types of losses they cause, population assessment, evaluation of advantages and disadvantages of different techniques used in pest management, and RPM programs. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 105. (Former course Agricultural Management and Rangeland Resources 105.) GE credit: SciEng | SE—II. (II.) Al-Khatib, Flint

112. Forage Crop Ecology (3) Lecture—3 hours. Prerequisite: course 2, Biological Sciences 1C, 2C, or consent of instructor. Forages as a world resource in food production. Ecological principles governing the adaptation, establishment, growth and management of perennial and annual forages, including pastures, rangelands and hay, aspects of forage production, and the herbivorous feeding value to livestock. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 112. (Former course Agricultural Management and Rangeland Resources 112.) Offered in alternate years. GE credit: SciEng | SE—II. (II.) Teuber

113. Biological Applications in Fruit Tree Management (2) Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2, Biological Sciences 1C or 2C. Phylogeny, physiology, growth and environmental requirements of fruit trees and the cultural practices used to maintain them. Emphasis on the application of biological principles in the culture of commercially important and potentially valuable fruit tree species. Not open for credit to students who have completed Plant Biology 173. (Former course Plant Biology 173.) GE credit: SciEng | SE—II. (II.) Delong

114. Biological Applications in Fruit Production (2) Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2, Biological Sciences 1C or 2C; course 113. Reproductive biology of tree crop species. Biological principles of fruit production, tree nutrition and orchard management for optimizing cropping. Laboratories emphasize hands-on work with orchard tree systems that are done specifically to produce the crop. Not open for credit to students who have completed Plant Biology 174. (Former course Plant Biology 174.) GE credit: SciEng | SE—II. (II.) Delong

131. Identification and Ecology of Grasses (2) Lecture—7.5 hours; laboratory—20 hours; discussion—5 hours. GE credit: SciEng | SE—II. (II.) Young

140. Culinary and Medicinal Herbs (3) Lecture/discussion—3 hours. Prerequisite: Plant Sciences 2, Biological Sciences 1C or 2C. An introduction to the edible and medicinal uses of common and unusual species of herbs and plants, including those used in traditional and modern medicine and as Souvenir of grasses in grazing ecosystems. Given the week following spring quarter. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 131. (Former course Agricultural Management and Rangeland Resources 131.) Offered in alternate years. GE credit: SciEng | SE, VL—II. (II.) Rice

144. Trees and Forests (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Plant Sciences 2 or Biological Sciences 1C or 2C. Biology and function of trees as organisms; understanding of forests as communities and ecosystems; use of forests by humans; tree phenology, photosynthesis, respiration, soil processes, life histories, dormancy, lightning, forest fire history, and agroforestry. (Same course as Environmental Science and Management 144.) Not open for credit to students who have completed Plant Biology 144 or Environmental Horticulture 144 or Environmental and Resource Science 144. (Former course Plant Biology/Environmental Horticulture/Environmental and Resource Science 144.) GE credit: SciEng | SE, VL—I. (I.) Berry, Dahlgren, Rice

147. California Plant Communities (3) Lecture/discussion—3 hours. Prerequisite: course 2 or Biological Sciences 2C. Ecology, distribution, and species of California’s plant communities. Environmental forces that determine the communities, the threats they face, and their conservation and restoration opportunities. Not open for credit to students who have completed Plant Biology 147. (Former course Plant Biology 147.) GE credit: SciEng | SE, VL—II. (II.) Young

147L. California Plant Communities Field Study (1) Discussion/laboratory—3 hours. Prerequisite: course 2 or Biological Sciences 2C, and concurrent or previous enrollment in course 147. Visits to many of northern California’s plant communities, from the north coast to the Central Valley to the Sierras. Discussion of community ecology and hands-on identification of species. Two Saturday field trips required. Not open for credit to students who have completed Plant Biology 147. (Former course Plant Biology 147.) GE credit: SciEng | SE, VL—II. (II.) Young

150. Sustainability and Agroecosystem Management (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: Soil Science 10, Chemistry 2A, and course 2, Biological Sciences 1C or 2C. Interdisciplinary analysis of agricultural production and food systems with primary emphasis on biophysical processes. General concepts governing the functioning of temperate and tropical agroecosystems in relation to resource availability, ecological sustainability, and socioeconomic viability. Comparative ecological analyses of agroecosystems. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 150. (Former course Agricultural Management and Rangeland Resources 150.) GE credit: SciEng | OL, SE, SL—III. (III.) Six

152. Plant Genetics (4) Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: Biological Sciences 1A or 2A or consent of instructor. Basic principles of transmission genetics, cytogenetics, population genetics, and molecular genetics. Practical aspects of genetic crosses and analysis of segregating populations. Not open to students who have completed Plant Biology 152. (Former course Plant Biology 152.) GE credit: SciEng | SE

153. Plant, Cell, Tissue and Organ Culture (4) Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: course 2 or Biological Sciences 1C or 2C. Basic anatomy and physiology of plant tissues and organs. Development of plant and animal propagules including media preparation, micropropagation, organogenesis, embryogenesis, anther culture, protoplast culture and transformation. Not open for credit to students who have completed Plant Biology 153. (Former course Plant Biology 153.) GE credit: SciEng | SE

154. Introduction to Plant Breeding (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 152, Biological Sciences 101 or consent of instructor. The principles, techniques, and applications of plant breeding and genetics to the improvement of crop plants. Illustration of how plant breeding is a dynamic, multidisciplinary, constantly-evolving science. Laboratory emphasizes hands-on experience in plant breeding procedures.
157. Physiology of Environmental Stresses in Plants (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: course 100C or Plant Biology 111 or 112 or Environmental Horticulture 102 or Viticulture and Enology 110. Stress concepts and principles; molecular, physiological, developmental and morphological characteristics enabling plants to avoid or tolerate environmental stresses; stress acclimation and adaptation processes; responses of wild and cultivated species to drought, flooding, nutrient deficiencies, salinity, toxic ions, extreme temperatures, etc. Not open for credit to students who have completed Plant Biology 157. (Former course Plant Biology 157.) GE credit: SciEng | SE.

158. Mineral Nutrition of Plants (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 100A or Plant Biology 111 or Environmental Horticulture 111 or Enology 110. Evolution and scope of plant nutrition; essential elements; mechanisms of absorption and membrane transporters; translocation and allocation processes; mineral metabolism: deficiencies and toxicities; genetic variation in plant nutrition; applications to management and understanding ecological effects of nutrient availability or deficiency. Not open for credit to students who have completed Plant Biology 158. (Former course Plant Biology 158.) GE credit: SciEng | SE. 

160. Agroforestry: Global and Local Perspectives (3)
Lecture/discussion—3 hours. Prerequisite: Plant Sciences 122 or Biological Sciences 1C or 2C. Plant Sciences 142 or 150 or Biological Sciences 28 or a general ecology course. Traditional and evolving use of trees in agricultural ecosystems; their multiple roles in environmental stabilization and production of food, fuel, and fiber; and socioeconomic barriers to the adoption and implementation of agroforestry practices. Not open for credit to students who have taken previously taken Agricultural Management and Rangeland Resources 160. (Former course Agricultural Management and Rangeland Resources 160.) [Same course as International Agricultural Management and Rangeland Resources 160. (Former course Agricultural Management and Rangeland Resources 160.) GE credit: SciEng | SE.—II. St. Clair

162. Urban Ecology (3)
Lecture/discussion—3 hours. Prerequisite: a course in general or plant ecology (course 142, Plant Biology 117 Environmental Science and Policy 100, or Evolution and Ecology 101). Application of fundamental concepts and approaches in landscape and ecosystem ecology to urban ecosystems. Ecological and social drivers and responses. Landscape heterogeneity; nutrient dynamics, invasive species, altered hydrology and climate, and pollution. Discussion of primary literature. GE credit: SciEng | SE, SL.—II. Ladewitz, Zakharov

170A. Fruit and Nut Cropping Systems (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2 or Biological Sciences 1C or 2C. Weed biology and ecology; methods of weed control; economic perspectives. May be repeated for credit. Not open for credit to students who have completed Plant Biology 170A. Offered in alternate years. GE credit: SciEng | SE.—II. St. Clair

170B. Fruit and Nut Cropping Systems (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2, Biological Sciences 1C or 2C, Chemistry 88 or 118B; course 100C, Plant Biology 111, Environmental Horticulture 102, or Hydrologic Science and Rangeland Resources 170B. (Former course Agricultural Management and Rangeland Resources 170.) Offered in alternate years. GE credit: SciEng | SE, SL.—III. Gradziel (change in existing course—eff. winter 13)

171. Principles and Practices of Plant Propagation (4)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: course 2, Biological Sciences 1C or 2C. Principles and practices of propagating plants covering anatomical, physiological, and practical aspects. Not open for credit to students who have completed Plant Biology 171. (Former course Plant Biology 171.) GE credit: SciEng | SE.—II. St. Clair

172. Postharvest Physiology and Technology (4)
Lecture—3 hours; laboratory/discussion—2 hours. Prerequisite: general plant science background (e.g., courses 2, 12), course 196 recommended. Overview of physiological processes related to maturation and senescence of plant products and their responses to postharvest stresses. Targeted approaches and technologies to maintain product quality and limit postharvest disorders. Not open for credit to students who have completed Plant Biology 172. (Former course Plant Biology 172.) GE credit: SciEng | SE.—II. Saltveit, Zakharov

173. Molecular and Cellular Aspects of Postharvest Biology (3)
Lecture/discussion—3 hours. Prerequisite: course 2, Biological Sciences 1C or 2C or equivalent. Basic concepts and current knowledge of issues relevant to postharvest biology. Membrane transport, protein catabolism, and postharvest respiration, senescence, programmed cell death. Metabolism and functions of phytohormones, carbohydrates, lipids, pigments, flavor compounds, and phytoxins at molecular and cellular levels. GE credit: SciEng | SE.—II. Gradziel

174. Microbiology and Safety of Fresh Fruits and Vegetables (3)
Lecture—3 hours. Prerequisite: course 2 or Biological Sciences 1C or 2C or equivalent. Overview of microorganisms on fresh produce, pre- and postharvest factors influencing risk of microbial contamination, attachment of microorganisms to produce, multiplication during postharvest handling and storage, and methods of detection and outbreak traceback and presentation of science-based forensic discovery. GE credit: SciEng | SE.—II. Saltveit, Zakharov

175. Introduction to Weed Science (4)
Lecture—2 hours; laboratory/discussion—4 hours. Prerequisite: course 2 or Biological Sciences 1C or 2C. Weed biology and ecology; methods of weed control; economic perspectives. May be repeated for credit. Not open for credit to students who have completed Plant Biology 175. (Former course Plant Biology 176.) GE credit: SciEng | SE, SL.—II. St. Clair

178. Biology and Management of Aquatic Plants (3)
Lecture—3 hours. Prerequisite: course 2, Biological Sciences 1C or 2C, Chemistry 88 or 118B; course 100C, Plant Biology 111, Environmental Horticulture 102, or Hydrologic Science and Rangeland Resources 178. (Former course Agricultural Management and Rangeland Resources 178.) GE credit: SciEng | SE, SL., OL.—II. Van Horn

180. Seminar on Alternatives in Agriculture (2)
Seminar—2 hours. Prerequisite: upper division standing. Seminar on topics related to alternative theories, practices and systems of agriculture and the relationship of agriculture to the environment and society. Scientific, technological, social, political and economic perspectives. May be repeated for credit. (Former course Agricultural Management and Rangeland Resources 180.) GE credit: SciEng, Wrt | OL, SE, WE.—II. (III.) Kliefenstein

194H. Senior Honors Thesis (2-6)
Independent study. Prerequisite: senior standing, overall GPA of 3.350 or higher and consent of major adviser. Two or three supervised seminars. Preparation and review of a scientific paper. Open to students who have completed Plant Biology 194H. Senior Honors Thesis. (P/NP grading only; deferred grading only, pending completion of thesis.) GE credit: SciEng, Wrt | OL, SE, WE.

196. Postharvest Technology of Horticultural Crops (3)
Lecture/discussion—45 hours; fieldwork—45 hours. Prerequisite: upper division or graduate student standing. Intensive study of postharvest considerations and current procedures and challenges in postharvest handling for fresh and processed fruit and ornamental in California. Scheduled first two weeks immediately following last day of spring quarter. Not open for credit to students who have completed Plant Biology 196. (Former course Plant Biology 196.) [P/NP grading only.] GE credit: SciEng | SE, WE.—II. (III.) Mitcham

Graduate

222. Advanced Plant Breeding (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 154 and 205; Genetics 2010 or Animal Genetics 107 recommended. Philosophy, methods, and problems in developing improved plant species. Topics include: inbreeding, heterosis, QTL mapping, breeding methodology, index selection, germ-
plasm conservation, and breeding for stress resistance. Laboratories include tours of breeding facilities and interactive oral and written interpretation of quantitative data. Offered in alternate years.—[III.] Teuber

(change in existing course—eff. winter 14)

Political Science

New and changed courses in Political Science (POL)

Lower Division

4. Basic Concepts in Political Theory (4)

Lecture—3 hours; discussion—1 hour. Analysis of such concepts as the individual, community, liberty, equality, justice, and natural law as developed in the works of the major political philosophers. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

(change in existing course—eff. winter 13)

51. Scientific Study of Politics (4)

Lecture—3 hours; discussion—1 hour. Introduction to the basic principles of the scientific study of politics. Research design and empirical analysis of data with applications to different methodological approaches and different substantive areas in political science. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

(change in existing course—eff. winter 13)

51A. History of Political Theory: Ancient (4)

Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 51. Historical development of political thought from the examination of ancient philosophers such as Plato, Aristotle, Cicero and St. Thomas. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

(change in existing course—eff. winter 13)

51B. History of Political Theory: Early Modern (4)

Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 51. Historical development of political thought from the Renaissance to the Enlightenment. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

(change in existing course—eff. winter 13)

51C. History of Political Theory: Late Modern (4)

Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 51. Historical development of political thought from the European Revolutions to the present. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, WC, WE.

(change in existing course—eff. winter 13)

51D. Quantitative Analysis of Political Data (4)

Lecture—3 hours; term paper or discussion—1 hour. Logic and methods of analyzing quantitative political data. Topics covered include central tendency, probability, correlation, and non-parametric statistics. Particular emphasis will be placed on understanding the use of statistics in political science research. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, WC, WE.

(change in existing course—eff. winter 13)

51E. Medieval Political Thought (4)

Lecture—3 hours; term paper. Prerequisite: course 51D. Examination of the ideas central to medieval political thinking. Emphasis will be upon the thoughts of the major political thinkers of the period, rather than upon political history. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

(change in existing course—eff. winter 13)

51F. Foundations of Political Thought (4)

Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. Analysis and evaluation of the seminal works of a major political philosopher or of a major problem in political philosophy. May be repeated one time for credit when topic differs. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

(change in existing course—eff. winter 13)

117. Topics in the History of Political Thought (4)

Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. The political thought of a specific historical period. Topics may include: Ancient Athens, the Italian Renaissance, the Enlightenment, or Nineteenth Century Germany. May be repeated once for credit. GE credit: SocSci, Wrt | SS, WE.

(change in existing course—eff. winter 13)

118A. History of Political Theory: Ancient (4)

Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. Critical analyses of the works of late ancient political philosophers such as Plato, Aristotle, Cicero and St. Thomas. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

(change in existing course—eff. winter 13)

118B. History of Political Theory: Early Modern (4)

Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. Critical analyses of the works of late modern political philosophers such as Rousseau, Kant, Hegel, Tocqueville, Mill, Marx and Nietzsche. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

(change in existing course—eff. winter 13)

118C. History of Political Theory: Late Modern (4)

Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. Critical analyses of the works of late modern political philosophers such as Rousseau, Kant, Hegel, Tocqueville, Mill, Marx and Nietzsche. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

(change in existing course—eff. winter 13)

119. Contemporary Political Thought (4)

Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. Contemporary political thought from the present. Emphasis upon an individual political philosopher, concept, or philosophical movement; e.g., Nietzsche, Continental political thought, Rawls and theories of distributive justice, feminist theory. Offered irregularly. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

(change in existing course—eff. winter 13)

192A. Internship in Public Affairs (5)

Prerequisite: enrollment dependent on availability of intern positions with highest priority assigned to students with Political Science–Public Service major; upper division standing. Supervised internship and study in political, governmental, or related organizations. (P/NP grading only.) GE credit: ACGH, SS, WE.

(change in existing course—eff. winter 13)

192B. Internship in Public Affairs (5)

Prerequisite: enrollment dependent on availability of intern positions with highest priority assigned to students with Political Science–Public Service major; upper division standing. Supervised internship and study in political, governmental, or related organizations. (P/NP grading only.) GE credit: ACGH, SS, WE.

(change in existing course—eff. winter 13)

193. Research in Practical Politics (2)

Research project—6 hours. Prerequisite: courses 192A, 192B; open only to Political Science–Public Service majors, for whom it is required. Supervised preparation of an extensive paper relating internship experience to concepts, literature, and theories of political science. GE credit: SocSci | SS, WE.

(change in existing course—eff. winter 13)

193W. Washington Center Research Seminar (4)

Lecture/discussion—1 hour; independent study—3 hours; tutorial—0.5 hour. Prerequisite: course 192W concurrently. Core academic component of Washington Program. Topics coordinated with internships. Research draws on resources uniquely available in Washington, DC. Supervised preparation of extensive paper. (Same course as UC Davis Washington Center 193.) GE credit: SocSci, Wrt | OL, SS, WE.

(change in existing course—eff. winter 13)

194HA-194HB. Special Study for Honors Students (4-4)

Seminar—2 hours; independent study—2 hours. Prerequisite: major in Political Science with upper division standing and a GPA of 3.500 in the major. Directed reading, research and writing culminating in preparation of a senior honors thesis under the direction of faculty adviser. (Deferred grading only, pending completion of sequence.) GE credit: SocSci | OL, SS, WE.

(change in existing course—eff. winter 13)

195. Special Studies in American Politics (4)

Seminar—4 hours; consent of instructor and upper division standing. Intensive examination of one or more special problems appropriate to American politics. May be repeated one time for credit when topic differs. GE credit: SocSci | ACGH, SS, WE.

(change in existing course—eff. winter 13)

196A. Seminar in American Politics (4)

Seminar—3 hours; term paper. Prerequisite: upper division political science major or consent of instructor. Intensive reading, discussion, research, writing in American politics. Topics may include Congress, the Presidency, the Supreme Court, federalism, voting behavior, interest groups, ethnic groups or other topics with a more specialized content than normal course offerings. May be repeated one time for credit when topic differs. GE credit: SocSci | ACGH, SS, WE.

(change in existing course—eff. winter 13)

196B. Seminar in Comparative Politics (4)

Seminar—3 hours; term paper. Prerequisite: upper division political science major or consent of instructor. Intensive reading, discussion, research, writing in comparative politics. Topics may include one country or geographical area, political institutions or behavior across countries, political development, or other topics that are more specialized than normal course offerings. May be repeated one time for credit when topic differs. GE credit: SocSci | SS, WE.

(change in existing course—eff. winter 13)

196C. Seminar in International Relations (4)

Seminar—3 hours; term paper. Prerequisite: upper division political science major or consent of instructor. Intensive reading, discussion, research, writing in international relations including study of international political institutions (UN, EU, or NATO) or interstate relations (war, trade, immigration) and other topics with more specialized content than normal course offerings. May be repeated one time for credit when topic differs. GE credit: SocSci | SS, WE.

(change in existing course—eff. winter 13)
Population Biology

New and changed courses in Population Biology (PBG) Graduate

233. Computational Methods in Population Biology (4)
Lecture/laboratory—2 hours; discussion/laboratory—1 hour. Prerequisite: course 211, 212, 279. Exponential Random Graph Models (ERGMs) of networks, game theoretic models of network formation and network dynamics, diffusion processes, shocks and network collapse, percolation, cross-network spillover processes, social and political applications of advanced network models. Offered irregularly. (new course—eff. fall 13)

Portuguese

New and changed courses in Portuguese (POR) Upper Division

100. Principles of Luso-Brazilian Literature and Criticism (4)
Lecture—3 hours; term paper. Prerequisite: course 3 or Spanish 24, 24S or 33. Principles of literary criticism applied to the study of fiction, poetry, and essays of major literary writers of the Luso-Brazilian world. GE credit: ArtHum | AH, WC, WE—II. (I.) Newcomb (change in existing course—eff. winter 13)

159. Special Topics in Luso-Brazilian Literature and Culture (4)
Lecture—3 hours; term paper. Prerequisite: course 3 or Spanish 24, 24S or 33. Special Topics in Luso-Brazilian Literature and Culture. May be repeated one time for credit. GE credit: ArtHum | AH, WC, WE—II. (I. I.) Bernucci, Newcomb (change in existing course—eff. winter 13)

161. Luso-Brazilian Literature and Culture (4)
Lecture/discussion—3 hours; term paper. Prerequisite: first year Portuguese or the equivalent. Colonial Brazilian literature as a historical and political record and the development of political concepts, or other topics leading to a revolutionary body of literature. GE credit: ArtHum | AH, WC, WE—III. (III.) Bernucci, Newcomb (change in existing course—eff. winter 13)

162. Introduction to Brazilian Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: first year Portuguese or the equivalent. Narra- tive and poetic texts of the 19th and 20th centuries in Brazil. In-depth and comparative study of Romantic and (Neo) Naturalist movements as a forum for the Concretists (1960s), including European avant-garde movements and literary and cultural manifestos leading to a revolutionary body of literature. GE credit: ArtHum | AH, WC, WE—II. (II.) Bernucci, Newcomb (change in existing course—eff. winter 13)

163. 20th C Masters in Brazilian Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: first year Portuguese or the equivalent. Overview of modern Brazilian literature from early 20th C to the poetry of João Cabral de Melo Neto and the Concretists (1960s), including European avant-garde movements and literary and cultural manifestos leading to a revolutionary body of literature. GE credit: ArtHum | AH, WC, WE—II. (II.) Bernucci, Newcomb (change in existing course—eff. winter 13)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor and Department Chairperson. GE credit only. (P/NP grading only.) (S/U grading only.)—I II, III, IV, V. (I. III.) Shapiro (change in existing course—eff. winter 14)

296. Seminar in Geographical Ecology (2)
Seminar—2 hours. Prerequisite: Evolution and Ecology 100 or 101 or consent of instructor. Recent developments in theoretical and experimental biogeo- graphy, historical biogeography and related themes in systematics, the biology of colonizing spe- cies, and related topics. (Same course as Geogra- phy 214.) (S/U grading only.)—I, II, III. (I. III.) Shapiro (change in existing course—eff. fall 12)

Psychology

New and changed courses in Psychology (PSC) Upper Division

124. Comparative Neuroanatomy (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: course 101 or Neurobiology, Physiology, and Behavior 100 or 101. Overview of the neuroanat- omy of the nervous system in a variety of mamma- lian and non-mammalian vertebrates. Examine changes or modifications to neural structures as a result of morphological or behavioral specializa- tions. (Same course as Neurobiology, Physiology, and Behavior 124.) GE credit. SL—II. (II.) Krubitzer, Recanzone (change in existing course—eff. fall 11)

143. Infant Development (4)
Lecture—3 hours; extensive writing. Prerequisite: courses 1 and 41, and either course 140 or Human Development 100A. Psychological development in infancy. Topics include physical and motor development, sensory and nervous system development, and memory and cognitive development. Emphasis will be on evaluating theories, empirical research, and experimental methods for understanding infant development. GE credit: WE—III. (III.) Oakes (change in existing course—eff. fall 12)

157. Stereotyping, Prejudice, and Stigma (4)
Lecture/discussion—4 hours. Prerequisite: course 151. Social psychological underpinnings of stereo- typing, prejudice, and stigma from sociocultural, motivational, and cognitive perspectives. Topics include: origins, maintenance, change, effects on person perception and memory, and the automaticity/controllability of stereotyping and prejudice. GE credit: Div—I, II, III, IV, V, VI. (I, II, III.) Sherman (change in existing course—eff. fall 13)

162. Introduction to Personality Psychology (4)
Lecture—3 hours; term paper. Prerequisite: course 1, 41. Pass One open to Psychology majors. Scientific study of personality. Methods of personality research. Overview of current research and theory in the field of personality psychology. Not open for credit to students who have completed former course 147. GE credit: SocSci, Wrt | SS—I, II, III, IV, V, VI. (I, II, III.) Robins, Shaver (new course—eff. spring 13)

Religious Studies

New and changed courses in Religious Studies (RST) Graduate

1A. Pilgrimage (4)
Lecture—3 hours; discussion—1 hour. Introduction to comparative religion, focusing on the theme of pil- grimage in different religious traditions. Not open to students who have taken course 3A. Offered irregu- larly. GE credit: ArtHum, Div, Wrt | AH, WC, WE—I, II, III, IV, V, VI. (I, II, III, IV) Tezcan, Yenikesen (change in existing course—eff. fall 13)

18. Death and Afterlife (4)
Lecture—3 hours; discussion—1 hour. Introduction to comparative religion, focusing on the theme of death and the afterlife in different religious traditions. Not quarter offered: I—Fall, II—Winter, III—Spring, IV—Summer, 2013-2014 offering in parentheses.
1C. Sacrifice (4)
Lecture—3 hours; discussion—1 hour. Introduction to comparative religion, focusing on the theme of sacrifice in different religious traditions. Not available to those who have taken course 3D. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —I, II, III, IV. (I, II, III, IV) Coudert
(change in existing course—eff. spring 13)

1D. Conversion (4)
Lecture—3 hours; discussion—1 hour. Introduction to comparative religion, focusing on the theme of conversion in different religious traditions. Not available to those who have taken course 3D. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —I, II, III, IV. (I, II, III, IV) Coudert
(change in existing course—eff. spring 13)

1E. Fundamentalism (4)
Lecture—3 hours; discussion—1 hour. Introduction to comparative religion, focusing on the idea of fundamentalism in different religious traditions. Not available to those who have taken course 3E. Offered irregularly. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, OL, VL, WE. —I, II, III, IV. (I, II, III, IV) Watenauph
(change in existing course—eff. spring 13)

1F. Religion Today (4)
Lecture—3 hours; discussion—1 hour. Introduction to comparative religion, focusing on different religious traditions in the contemporary world. GE credit: ArtHum, Div, Wrt | AH, DD, WC, WE. —I, II, III, IV. (I, II, III, IV) Coudert
(change in existing course—eff. spring 13)

10. Contemporary Ethical Issues (2)
Lecture—2 hours. Presents challenging, contemporary moral issues from a multicultural perspective. Rotating topics will include Ethical Eating, Capital Punishment, Euthanasia, Poverty, and Animal Rights. May be repeated for credit. GE credit: ArtHum, Wrt | AH, WE. —I, II, III. (I, II, III) Coudert
(change in existing course—eff. winter 13)

11. Ethical Eating (4)
Lecture—3 hours; term paper or discussion—1 hour. Introduction to the complex and varied ethical, religious, and cultural meanings that food has had across the centuries and globe. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, OL, VL, WC, WE. —Coudert
(change in existing course—eff. winter 14)

15Y. Reading War/Fighting War (4)
Lecture—2 hours; web electronic discussion—1 hour; extensive writing. Introduction to both classic religious texts about war and a set of actual scenarios drawn from the experience and training of soldiers in recent military conflicts. Offered irregularly. GE credit: ArtHum, Div, Wrt | ACDH, AH, DD, OL, VL, WC, WE. —(III) Janowitz
(new course—eff. spring 13)

21. Hebrew Scriptures (4)
Lecture—3 hours; term paper or discussion. Selected texts from the Hebrew Scriptures (Genesis II Chronicles) and related modern scholarship on the texts from a variety of perspectives (historical, literary, sociological, psychological). Course work is based on an English translation and no knowledge of Hebrew is required. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —I, II, III, IV. (I, II, III, IV)
(change in existing course—eff. spring 13)

30. Religions of South Asia (4)
Lecture—3 hours; discussion—1 hour. Introduction to South Asian religions, including Hinduism, Buddhism, Islam, Jainism and Sikhism. Traces historical developments from Vedic texts and their ascetical reformulations in India, Southeast Asia, South Asia, and the diaspora. GE credit: ArtHum, Div, Wrt | AH, WL, VL, WE. —I, II, III, IV. (I, II, III, IV) Elmore, Venkatesan
(change in existing course—eff. winter 14)

42. Religion and Science Fiction (4)
(change in existing course—eff. winter 14)

45. Christianity (4)
Lecture/discussion—3 hours; term paper or discussion. Major concepts and practices in the Christian tradition. Survey of the history of Christianity and Christianity's contribution to the modern world. Course work includes study of early Christianity: China, India, the Middle East, and Latin America. Offered in alternate years. GE credit: ArtHum | AH, VL, WC, WE. —I, II, III, IV. (I, II, III, IV) Coudert
(change in existing course—eff. winter 13)

50. Introduction to Islam (4)
Lecture/discussion—3 hours; term paper or discussion. Survey of the intellectual history of Islam from the early fourteenth century to the present. Topics include Ibn Khaldun, the Qur’an, Islamic law, theology, philosophy, cosmology, worship, and mysticism. Race and gender in Islam, Islamic revival, and varying experiences of Islam in different historical and cultural settings. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, VL, WC, WE. —I. (I) Tezcan
(change in existing course—eff. winter 14)

67. Modern Hinduism (4)
(change in existing course—eff. winter 13)

69. Introduction to Hindu Mythology (4)
Lecture/discussion—3 hours; term paper or discussion. One hour. Survey of the major narrative traditions within Hinduism, including epic literature and local stories in oral, textual, visual and performative forms. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE. —Venkatesan
(change in existing course—eff. winter 14)

70. Religion and Language (4)
Lecture/discussion—3 hours; term paper. Basic tool kit for studying religious discourse in a variety of traditions. Concepts of language and power, the wondrous and ordinary, and the mystical and reasonable. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —I, II, III. (I, II, III) Miller
(change in existing course—eff. winter 14)

80. Religion, Gender, Sexuality (4)
Lecture/discussion—3 hours; term paper. Constructions of gender and sexuality within one or more religious traditions, pre-modern and modern. Emphasis on the interaction between religious, medical, and ethical meanings of the human body and sexual behavior. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, WE. —II.
(change in existing course—eff. winter 13)

90. Human Rights (4)
Lecture/discussion—3 hours; term paper. Introduction to the interdisciplinary study of the origins, evolution, denial and protection of Human Rights. GE credit: ArtHum or SocSci, Div | AH or SS, WL, WE. —II. (I, II) Watenauph
(change in existing course—eff. winter 13)

Upper Division
100. Study of Religion: Issues and Methods (4)
Lecture—3 hours; term paper. Principal issues and methods of Religious Studies and associated fields. GE credit: ArtHum or SocSci | AH or SS, WC, WE. —III. (III)
(change in existing course—eff. winter 13)

120. Religion, Magic and Science (4)
Lecture—3 hours, extensive writing. Religion, magic, and science from the middle ages to the present. Contrast between modern scientific methodology and religious and magical thinking. (Same course as Science and Technology Studies 120.) Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, OL, VL, WC, WE. —I. (I) Coudert
(change in existing course—eff. fall 11)

122. Studies in Biblical Texts (4)
Lecture—3 hours; term paper. Prerequisite: course 21. Study of a book from the Prophets or writings from critical, historical, and religious perspectives. May be repeated one time for credit in different subject area. GE credit: ArtHum | AH, WE. —III. (III)
(change in existing course—eff. winter 13)

125. Dead Sea Scrolls, Apocrypha, and Pseudepigrapha (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 21 or 40 or consent of instructor. Survey of the Dead Sea Scrolls, apocryphal and pseudepigraphical writings of Judaism and Christianity and their historical, social, and religious importance. GE credit: ArtHum, Wrt | AH, WC, WE. —II. (II) Watenauph
(change in existing course—eff. winter 13)

131. Genocide (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course from courses 1, 2, 3A, 3B, 3C, 3E or permission of instructor. Comparative and critical study of the modern phenomenon of genocide from religious, ethical and historical perspectives. Offered in alternate years. GE credit: ArtHum or SocSci, Div | AH or SS, VL, WE. —I. (I) Watenauph
(change in existing course—eff. winter 13)

132. Topics in Mediterranean Ancient Religion (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 21, 40 or consent of instructor. Thematic study of specific sociological, literary or theological theme across the religious traditions of the ancient Mediterranean/Near East: Greek and Roman religions, Judaism, Christianity, Zoroastrism, Manichaeanism, etc. Topics may include creation, sacrifice, priesthoods, prophecies, holy books, the afterlife. Offered in alternate years. May be repeated two times for credit when topic differs. GE credit: ArtHum | AH, WC, WE. —I. (I) Vidas
(change in existing course—eff. winter 13)
134. Human Rights (4)
Lecture/discussion—3 hours; term paper. Introduc-
tion to the interdisciplinary study of the origins, evo-
lution, denial and protection of Human Rights. Students
who have completed course 90 are ineligi-
ble to receive credit for course 134. GE credit: ArtHum, Div | AH or SS, WC, WE.—II, III, IV, [III, IV] Watenspaugh
(change in existing course—eff. winter 13)

140. Christian Theology (4)
Lecture/discussion—3 hours; term paper. Prerequi-
tsive: course 40; course 102 recommended. Histori-
cal and systematic introduction to Christian doctrine,
with attention to divergent traditions and the prob-
lem of orthodoxy and heresy. GE credit: ArtHum | AH, WC, WE.—I, II
(change in existing course—eff. winter 13)

143. New Testament Apocrypha (4)
Lecture—3 hours; term paper. Prerequisite: course
40. Extra-canonical Christian writings and their re-
ception, from antiquity to the present. Emphasis on
the importance of New Testament figures both as lit-
erary characters and as authors within different
(change in existing course—eff. winter 14)

144. History of the Bible (4)
Lecture—3 hours; term paper. Prerequisite: course
21 or 40. History of the formation of the Christian biblical
canon, with emphasis on differences between
Christian traditions; survey of translations and adap-
tations of biblical narrative in Christianity, Judais-
m, and Islam, as well as in contemporary cul-
(change in existing course—eff. winter 14)

145. Contemporary American Religion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 40 and History 178 recommended. Examina-
tion of several major movements and phenomena in
twentieth-century American religion. Offered in alter-
nate years. GE credit: ArtHum | ACGH, AH, DD, WE.—I, II, III
(change in existing course—eff. winter 13)

150. Religious Ethics (4)
Lecture/discussion—3 hours; term paper or discus-
sion. Prerequisite: course 10 recommended. Study of
the religious bases of ethics through examination of
ethical problems that arise in different religious cul-
tures around the world and in nations where multiple
religious cultures face similar issues. Offered irregu-
larly. GE credit: ArtHum, Div, Wrt | AH, WC, WE.—Chin, Coudert
(change in existing course—eff. winter 14)

170. Buddhism (4)
Lecture—3 hours; term paper. Buddhism in its pan-
Asian manifestations, from its beginning in India to
its development in Sri Lanka and Southeast Asia,
Central Asia, China and Japan; teachings and prac-
tices, socio-political and cultural impact. Offered in alter-
nate years. GE credit: ArtHum | AH, VL, WC, WE.—Elmore
(change in existing course—eff. winter 13)

104

Russian

New and changed courses in Russian (RUS)

Lower Division

1. Elementary Russian (5)
Discussion—5 hours; laboratory—1 hour. Introduc-
tion to Russian grammar and development of all lan-
guage skills in a cultural context with special
emphasis on communication. (Students who have
completed any Introductory Russian course are not
eligible to receive unit credit for this course on a P/NP
gradation basis only. Although a passing grade will be
charged to the student’s P/NP, no petition is allowed. All
other students will receive a letter grade unless a P/NP
petition is filed.) GE credit: ArtHum | AH, WC, WE.—I, II
(change in existing course—eff. winter 13)

2. Elementary Russian (5)
Discussion—5 hours; laboratory—1 hour. Prerequi-
tsive: course 1. Continuation of grammar and lan-
guage skills developed in course 1. GE credit: ArtHum | AH, WC.—II, III
(change in existing course—eff. winter 13)

3. Elementary Russian (5)
Discussion—5 hours; laboratory—1 hour. Prerequi-
tsive: course 2. Continuation of grammar and lan-
guage skills developed in course 2. GE credit: ArtHum | AH, WC.—III
(change in existing course—eff. winter 13)

4. Intermediate Russian (4)
Discussion—4 hours; laboratory—1 hour. Prerequi-
tsive: course 3. Grammar review. Introductory prac-
tice. GE credit: ArtHum | AH, WC.—I, II
(change in existing course—eff. winter 13)

5. Intermediate Russian (4)
Discussion—4 hours; laboratory—1 hour. Prerequi-
tsive: course 4. Grammar review. Introduction to liter-
atu. GE credit: ArtHum | AH, WC.—II
(change in existing course—eff. winter 13)

6. Intermediate Russian (4)
Discussion—4 hours; laboratory—1 hour. Prerequi-
tsive: course 5. Grammar review. Intermediate
version and continued reading of literature. GE credit: ArtHum | AH, WC.—III
(change in existing course—eff. winter 13)

Upper Division

101A. Advanced Russian (4)
Lecture/discussion—3 hours; extensive writing. Pre-
requisite: course 6 or consent of instructor. Topics in
Russian. Grammar for the advanced student. Reading and discussion of journalistic texts and classic and contemporary literature. Conversational exercises utilizing literary and colloquial vari-
ants of current Russian speech. GE credit: ArtHum | AH, VC.—I, II
(change in existing course—eff. winter 13)

101B. Advanced Russian (4)
Lecture/discussion—3 hours; extensive writing. Pre-
requisite: course 101B. Continuation of course
101B. Topics in Russian grammar for the advanced
student. Reading and discussion of journalistic texts
and classic and contemporary literature. Conversa-
tional exercises utilizing literary and colloquial vari-
ants of current Russian speech. GE credit: ArtHum | AH, WC.—III
(change in existing course—eff. winter 13)

105. Advanced Russian Conversation (4)
Recitation—3 hours; practice—1 hour. Prerequi-
tsive: course 6. Intensive conversational practice and dis-
cussion based on current events and contemporary
texts. Offered in alternate years. GE credit: ArtHum | AH, OL.—II
(change in existing course—eff. winter 13)

124. Twentieth-Century Russian Literature (4)
Lecture/discussion—3 hours; term paper. Prerequi-
tsive: completion of Subject A requirement. History of Russian literature (prose, drama, poetry) from the period
between 1900 and the end of the 20th century. May
include authors like Y. Olesha, M. Bulgakov, D.
Kharms, and L. Petrukhlevskaia. Offered alternately
in English or Russian. Not open for credit to students
who have taken courses 123 or 128. GE credit: ArtHum | AH, WC, WE.—I, II, III, [I, II, III] Kaminer
(change in existing course—eff. winter 13)

129. Russian Film (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequi-
tsive: completion of Subject A requirement.
History of Russian film; film and social revolution, the
culture of Stalin, dissident visions; film and the collapse
of the Soviet empire; gender and the nation in Rus-
sian film. Course taught in English; films are in Rus-
sian with English subtitles. Offered in alternate
years. (Same course as Film Studies 129.) GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—II
(change in existing course—eff. fall 11)

142. Women in Russian Culture (4)
Lecture/discussion—3 hours; term paper. Prerequi-
tsive: one introductory course in literature. Study of
the representation of (and by) women in contempo-
rary Russian fiction and film. Exploration of issues
such as family dynamics/motherhood, sexuality, work,
and women's relationship to the state. Offered in
English. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—I, II
Kaminer
(change in existing course—eff. fall 14)

192. Research Essay (2)
Prerequisite: a Russian literature course (may be taken concurrently). A research essay, based on pri-
mary and secondary sources, dealing in depth with a
topic arising from or related to the prerequisite lit-
terature course. May be repeated for credit. GE
credit: ArtHum | AH, WC, WE.
(change in existing course—eff. winter 13)

Science and Society

New and changed courses in Science and Society (SAS)

Lower Division

7V. Terrorism and War (4)
Web Virtual Lecture—3 hours, autotutorial—5 hours, web
electronic discussion—1 hour, extensive writ-
ing; term paper or discussion. Prerequisite: consent
of instructor. Terrorism and war from science and
social sciences perspectives: terrorism (terrorist cells,
WMD's, religious extremism), warfare (military strat-
Science and Technology Studies

New and changed courses in Science and Technology Studies (STS)

**Lower Division**

98. Directed Group Project (1-5)
Prerequisite: consent of instructor (P/NP grading only)
GE credit: SS.
(change in existing course—eff. winter 13)

120. Religion, Magic and Science (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Historical, aesthetic and critical approaches to how information technologies produced ghost effects or a sense of horror in response to new media like the photograph, grammophone, typewriter, computer, Turing Machine. Focus on technological media transforms sense perception. Offered in alternate years.
GE credit: ArtHum, Wrt | AH, OL, VL, WE.—Coudert
(change in existing course—eff. fall 11)

Lecture—3 hours; extensive writing or discussion—1 hour. Historical, aesthetic and critical approaches to how information technologies produced ghost effects or a sense of horror in response to new media like the photograph, grammophone, typewriter, computer, Turing Machine. Focus on technological media transforms sense perception. Offered in alternate years.
GE credit: ArtHum, Wrt | AH, OL, VL, WE.—Coudert

164. Writing Science (4)
Lecture/discussion—3 hours; extensive writing. Pre-
requisite: English 3 or course 1, or equivalent. Texts and writing practices in the production of scientific knowledge. Surveys the literary structure of scientific arguments; heuristics; rhetoric and semantics in scientific culture; graphical systems in the experimental laboratory; narratives of science, including science fiction. (Same course as English 164.) Offered in alternate years.
GE credit: ArtHum, Wrt | AH, OL, VL, WE.—Ravetto-Biagioli
(new course—eff. fall 13)

175. Laboratory Studies Lab (4)
Lecture/discussion—4 hours; extensive writing. Pre-
requisite: upper division standing or consent of instructor. Hands-on training in Science and Technology Studies fieldwork, interviewing, archival research and data analysis. Review of laboratory studies literature, informed consent procedures, ethics, and care of the data. Individual and group projects possible. GE credit: SocSci | SS, WE.—Milburn
(change in existing course—eff. winter 13)

176. Sociology of Knowledge, Science, and Scientific Knowledge (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: upper division standing preferred. Social, cultural, and historical dimensions of knowl-
edge, especially scientific knowledge. Problems, methods, and theory in sociology of scientific knowl-
edge. Laboratory and historical case studies. Scientific and technical knowledge in institutional and organizational contexts. (Same course as Sociology 176.) GE credit: SocSci | SS.—Carroll
(change in existing course—eff. winter 13)

**Upper Division**

102. Society and Culture of California (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: introductory course in Sociology recom-
ended. California’s distinctive society and culture; sociological analyses of topical issues concerning diversity, environment, cities. GE credit: SocSci | ACGH, DD, SS.
(change in existing course—eff. winter 13)

103. Evaluation Research Methods (4)
Lecture—3 hours; discussion—1 hour; term paper; project. Prerequisite: course 46A and 46B, or Stat-
istics 13 or the equivalent. Surveys applications of research methods to the evaluation of social pro-
grams, primarily emphasizing methodological issues, e.g., research design and data collection; uses of evaluation research are also discussed and placed in theoretical context. Participation in an evaluation project. GE credit: SocSci | SS, WE.
(change in existing course—eff. winter 13)

104. The Political Economy of International Migration (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: upper division standing. Analysis of worldwide migration patterns, and social scientific theories of international and transnational migration. Focus in economical, political, and social impact of migration and potential for international and regional cooperation. (Same course as International Relations 104.) GE credit: SocSci | SS, WE.
(change in existing course—eff. winter 13)

106. Intermediate Social Statistics (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: course 46B or Statistics 13 or the equivalent. Inter-
mediate level course in statistical analysis of social
118. Political Sociology (4)
Lecture—3 hours; discussion—1 hour; term paper; project. Relation of social cleavages and social cohesion to the functioning of political institutions; the social bases of local and national power structures; social sources of political movement, analysis of concepts of alienation, revolution, ideology, ruling class, and elite. GE credit: SocSci | QL, SL, SS.

[change in existing course—eff. fall 12]

120. Deviance (4)
Lecture—3 hours; term paper or discussion. Social structural sources of deviant behavior and criminality and the processes associated with illegality, evil, disease, immorality, disability, racial and class differences, citizenship, and the body. Special emphasis on expert knowledge and the production and management of social difference. GE credit: SocSci | SS.

[change in existing course—eff. winter 13]

122. Sociology of Adolescence (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Chronological age and social status, processes of socialization, the role of the family and human development. GE credit: SocSci | ACGH, DD, SS.

[change in existing course—eff. winter 13]

123. American Society (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. The demographic and social structure of American society and population, with emphasis on ethnic and class groups as bases for political and economic interest. Attention to selected current social controversies. GE credit: SocSci | ACGH, DD, SS.

[change in existing course—eff. winter 13]

124. Sociology of Education (4)
Lecture—3 hours; discussion—1 hour; term paper; project. Education and the social structure. Class size, curriculum, and economies of scale. Relations between families and schools in socialization; familial and structural sources of deviant behavior, the socialization of children and adolescents. The emergence of "youth cultures." Generational succession as a cultural problem. GE credit: SocSci | SS.

[change in existing course—eff. winter 13]

126. Social Interaction (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1, 2, 3. Every person interacts in natural settings; ethnographic approaches to the understanding of social meanings, situations, personal identity and human relationships. Particular attention to the work of Erving Goffman and to principles of field observation and qualitative analysis. GE credit: SocSci, Writ | SS.

[change in existing course—eff. winter 13]

127. Sociology of Death (4)
Lecture—3 hours. Prerequisite: course 1 or the equivalent. Overview of attitudes toward, structural effects of, and methods of coping with death and dying related behaviors. Particular attention to social psychological aspects of death and dying, to death rituals in various cultures. GE credit: SocSci, Writ | SS.

[change in existing course—eff. winter 13]

128. Intercultural Interpersonal Dynamics (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: one course from courses 1, 2, 3, Afro-American Studies 10, Asian American Studies 1, 2, Chicano Studies 10, Native American Studies 1. Analysis of the influences of cultural differences and racial stratification on interpersonal interaction in institutional settings (e.g., work, education, political action) and intimate settings (e.g., friendship, love, marriage, family). Minority/majority relationships. GE credit: SocSci, Div, Writ | SS.

[change in existing course—eff. winter 13]

129. Sociology of Black Experience in America (4)
Lecture—3 hours; discussion—1 hour; term paper; project. Special topics in social, political, cultural, and sub-cultural dimensions of the Black American experience. GE credit: SocSci, Div | ACGH, DD, SS.

[change in existing course—eff. winter 13]

130. Race Relations (4)
Lecture—3 hours; term paper or discussion—1 hour. Functions of the social definitions of race and racial groups. Analysis of racial conflict, oppression, and other forms of ethnic stratification. Models of ethnic interaction and social change. Emphasis on racial relationships within the U.S. GE credit: SocSci, Div | ACGH, DD, SS.

[change in existing course—eff. winter 13]

133. Sexual Stratification and Politics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 13. Functions of the social definitions of race and racial groups. Analysis of sexual conflict, oppression, and other forms of ethnic stratification. Models of ethnic interaction and social change. Emphasis on selected controversies. Prerequisite: course 1, 2, 3, and upper division standing. Social and cultural factors influencing friendships and intimate relationships. Topics include relationship development, relationship maintenance, and relationship loss. GE credit: Div, SocSci, Writ | SS.

[change in existing course—eff. winter 13]

134. Sociology of Racial Ethnic Families (4)
Lecture—3 hours; discussion—1 hour or term paper. Asian American, Black, Chicano, and Native American family life in comparative historical perspective. Family structure and gender roles are considered in relation to socio-historical dynamics. Offered in alternate years. GE credit: SocSci, Div, Writ | ACGH, DD, SS.

[change in existing course—eff. winter 13]

135. Social Relationships (4)
Lecture—3 hours; discussion—1 hour or term paper. Prerequisite: course 1, 2, or 3, and upper division standing. Social and cultural factors influencing friendships and intimate relationships. Topics include relationship development, relationship maintenance, and relationship loss. GE credit: Div, SocSci, Writ | SS.

[change in existing course—eff. winter 13]

137. African American Society and Culture 1790-1990 (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1. Political and social transformations of African American communities between 1790 and 1990, as seen through film, literature, and music. Topics include: Black consciousness, Afro-Slave culture, The Harlem Renaissance, and contemporary Hip Hop. GE credit: SocSci | ACGH, DD, SS.

[change in existing course—eff. winter 13]

138. Economic Sociology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A or 1B and upper division standing in the social sciences. Overview of the rapidly growing field of economic sociology. Focus on variations in the ways that markets are organized. The relationship between individual and collective rationality will also be emphasized. GE credit: SocSci | ACGH, SS, WC.

[change in existing course—eff. winter 13]

139. Corporations and Society (4)
Lecture—3 hours; discussion—1 hour; term paper. Prerequisite: course 1 or 2, or upper division standing. The study of the history and power of the modern corporation; corporate organization; politics, the state, and the corporation; labor unions and the labor process; competition, regulation, and international markets; the multinational and conglomerate corporation; and mass markets and consumerism. GE credit: SocSci | ACGH, SS.

[change in existing course—eff. winter 13]

140. Social Stratification (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Selected technological and social factors. Preconditions of economic development and industrialization. Social, political, and cultural issues at various levels of economic development. Major historical differences and major current trends. Emphasis either on highly industrialized countries or on less developed countries. GE credit: SocSci, Writ | SS.

[change in existing course—eff. winter 13]

143A. Urban Society (4)
Lecture—3 hours; discussion—1 hour or term paper or project (instructor’s option). Prerequisite: course 1 or the equivalent. Theories of cities origins. Analysis of the historic process of urbanization and of varying city types. Comparison of American and European experience of urbanization, counterurbanization, and neighborhood change. Consideration of competing theories of urban growth and change and competing visions of the urban future. Offered in alternate years. GE credit: SocSci | SS.

[change in existing course—eff. winter 13]

143B. Sociology of City Life (4)
Lecture—3 hours; discussion—1 hour or term paper or project (instructor’s option). Prerequisite: course 1 or the equivalent; course 13A recommended. Critical discussion of the “city” as a concept. Analysis of the organization of primary ties in the city, of the culture of urban public life and of the learning of city skills. Offered in alternate years. GE credit: SocSci, Writ | SS.

[change in existing course—eff. winter 13]

144. Agriculture and Society (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Prerequisite: advanced standing in the social sciences or one year of course work in agricultural and environmental sciences. Development of agriculture as a major enterprise in modern society with the concomitant reduction in the labor force and family farms. Analysis of issues including mechanization, migrant labor, corporate farming, and public resource policy. Offered in alternate years. GE credit: SocSci | SS.

[change in existing course—eff. winter 13]

145A. Sociology of Third World Development (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Prerequisite: course 1; upper division standing. Introduction to theories and contemporary issues in the sociology of development. Topics such as growth, agrarian change, class, status groups, international division of labor, sectoral shifts, international capital, internal economic, gender, and political processes are analyzed within a comparative historical framework. GE credit: SocSci, Div, Writ | SS, WC.

[change in existing course—eff. winter 13]
143B. Gender and Rural Development in the Third World (4)
Seminar—GE credit. Prerequisite: course 1; upper division standing. Economical analysis of women and work during the process of socioeconomic change in the world with particular attention to the family/household context. Offered in alternate years. GE credit: SocSci | Div | Wrt | SS, WC. (change in existing course—eff. winter 13)

147. Sociological Perspectives on East Asia (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Sociological theories and concepts applied toward understanding East Asian society. Emphasis on the political structure, stratification, and economy in China and Japan. Analysis of historical and contemporary similarities and differences. Offered in alternate years. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

148. Collective Behavior (4)
Lecture—3 hours; discussion—1 hour or term paper or project (instructor's option). Prerequisite: course 1 or the equivalent. Study of behavior of human crowds and reaction to extraordinary circumstances, including crowd pans, mass scares, collective protests, riots, revolutionary situations, ecstatic and revivalist gatherings, crazes, fads, and fashions. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

149. Religion and American Society (4)
Lecture—3 hours; class project. Historical, contemporary survey of religious traditions and organizations and their relation to U.S. social and cultural patterns. Civil religion, religious pluralism, minority and deviant communities, religious migration, U.S. religion as a social institution, and religion, politics, and social stratification. Offered in alternate years. GE credit: SocSci, Div, Wrt | ACGH, DD, SS. (change in existing course—eff. winter 13)

150. Criminology (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Sociological analysis of criminal behavior in relation to social structure and the criminalization process. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

151. The Criminal Justice System (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 150 and upper division standing. Sociological analysis of the different components of the criminal justice system including the emergence and interpretation of criminal laws, the contemporary roles and functions of the police, criminal courts and correctional institutions. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

152. Juvenile Delinquency (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Study of juvenile delinquency in relation to the family, peer groups, community, and institutional structures. Consideration of processing of the delinquent by formal agencies of control. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

153. The Sociology of Childhood (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Contemporary childhood in historical, cross-cultural, and global perspectives. Examines changes in understanding of the nature of childhood and "best interests of the child" by class, race, gender, geographic region, and historical period. GE credit: SocSci | ACGH, DD, SS, WC. (change in existing course—eff. winter 13)

154. Sociology of Health Care (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. The sociological research in medicine and health care, with emphasis on the organizational, institutional, and social psychological aspects. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

155. Sociology of Law (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Law considered from a social control; relation of legal institutions to society as affecting judicial decision making and administration of justice. Lawyers as an occupational group. Legal reform. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

157. Social Conflict (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Analysis of the causes, dynamics, and regulation of social conflict within and between various kinds of social groupings with particular reference to nonviolent methods of waging and regulating conflict. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

158. Women's Social Movements in Latin America (4)
Lecture—3 hours; term paper. Restricted to upper division standing. Contemporary women's social movements in Latin America, focusing on Honduras, El Salvador, Brazil, and Nicaragua. Examination of exploitation and oppression in Latin America. GE credit: SocSci | DD, SS, WC. (change in existing course—eff. winter 13)

159. Sociology of Work and Employment (4)
Lecture—3 hours; term paper or discussion—1 hour. Pass 1 restricted to upper division majors and gradudate students. Historical and contemporary overview of employment, work, and occupations in American society. Study of authority and power relations, labor markets, career system, stratification, and corporate structures, and how these factors shape work in diverse or organizational and employment setting. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

160. Sociology of the Environment (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: upper division standing. Sociology of work and environmental problems, strongly recommended. Production, consumption, and urban expansion. Basic social logics surrounding current problems of resource scarcity (environmental extinction, environmental degradation, environmental additions). Ways that society can change and reorganize itself to become more environmentally conscious and hence ecologically sustainable. GE credit: SocSci | ACGH, DD, SS, WC. (change in existing course—eff. winter 13)

161. The Civil Justice System (4)
Lecture—3 hours; term paper. Prerequisite: course 155; upper division standing. Pass 1 open to upper division and graduate Sociology & Sociology Organization Studies majors. Empirical studies of the different aspects of the civil justice system in the United States and the society including the legal system, police, courts, juries, civil rights, and international laws relating to trade, the environment, and human rights—II. (II) (new course—fall 13)

171. Sociology of Violence and Inequality (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing or consent of instructor. How systems of social inequality organize the practice of violence. Definitions of violence and issues affecting the social capacity for violence. Analysis and comparison of different forms of violence associated with race, class, gender relations and social organization. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

172. Ideology of Class, Race and Gender (4)
Lecture—4 hours. Examination of popular belief systems that accompany relations between social classes, whites and blacks, and men and women in the United States. How do dominant groups attempt to justify each relationship, and is there ideological conflict or consensus between groups. GE credit: SocSci, Div, Wrt | ACGH, DD, SS. (change in existing course—eff. winter 13)

173. Sociology Through Literature (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Introduction to analysis of literature as sociological data. Reading of numerous works on American and other societies by authors such as Steinbeck, Lewis, Dreiser, Schulberg, Orwell, etc. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

174. Sociology of the Jewish Experience (4)
Lecture—3 hours; term paper or research project—1 hour. Prerequisite: upper division standing required. The sociology of Jewish life, analyzing challenges to Jewish identity and community in the diaspora. Diversity within the Jewish community, anti-Semitism, women, new immigrants, post-Holocaust Jewish identity, and Black-Jewish relations. Offered in alternate years. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

175. Mass Communication (4)
Lecture—3 hours; term paper. Prerequisite: course 1 or 2. Examines the relationship between the media and social structures. History of media-state relations. Media as reflector and shaper of values. Emphasis on current European and Marxist and pluralist theories rather than on content analysis. Offered in alternate years. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

176. Sociology of Knowledge, Science, and Scientific Knowledge (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: upper division standing preferred. Social, cultural, and historical dimensions of knowledge, especially scientific knowledge. Problems, methods, and theory in sociology of scientific knowledge. Laboratory and historical case studies. Scientific and technical knowledge in institutional and organizational contexts. (Same course as Science and Technology Studies 176.) GE credit: SocSci | SS. (change in existing course—eff. winter 13)

180A. Complex Organizations (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Prerequisite: course 1; Economics 1A and 1B recommended. Develops a sociological approach to organizations theory. Designed to introduce sociological concepts, address the alternative psychological and economic models, and involve students in the practice of organizational analysis. GE credit: SocSci | SS. (change in existing course—eff. winter 13)

180B. Complex Organizations (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Prerequisite: course 180A or consent of instructor. Builds on concepts and skills developed in course 180A. Deals with the issues of organizational decision making, design, and survival. Emphasis on relations between organizations and the effects of those relations in both the public and private sectors. GE credit: SocSci | SS. (change in existing course—eff. winter 13)
181. Social Change Organizations (4)
Lecture—3 hours; discussion—1 hour or term paper. Prerequisite: course 100 or the equivalent. Analysis of organizations with social change and improvement goals and programs, emphasizing voluntary associations and grassroots citizen groups. Topics treated include formation, decision making and leadership, strategies and tactics, factionalism and coalitions, effectiveness. Offered in alternate years. GE credit: SocSci, Writ | SS.
(change in existing course—eff. winter 13)

183. Comparative Organizations (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 180A or 180B; upper division standing. Examination of economic and political organizations of major industrial nations. Discussion of historical, cultural, social, and political influences on industrial patterns and policies, and the decisions of strategies for explaining differing developments. Societies may include Sweden, Japan, Germany, Taiwan, and South Korea. Offered in alternate years. GE credit: SocSci, ACGH, SS, WC.
(change in existing course—eff. winter 13)

185. Sociology of Social Welfare (4)
Lecture—1 hour or term paper or research project. Sociological analysis of the evolution and current organization of welfare functions in modern societies. GE credit: SocSci | SS.
(change in existing course—eff. winter 13)

188. Social Stratification in China (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Social and political systems and patterns of social stratification in relation to change in state power and economic institutions in China since 1949. Offered in alternate years. GE credit: SocSci | SS, WE.
(change in existing course—eff. winter 13)

189. Social Science Writing (4)
Lecture—3 hours; discussion—1 hour or term paper. Prerequisite: course 100A or equivalent. Upper division standing and 12 units of social science. Improved analytic writing and methods for reporting social science research to a wider public. Sociological analysis of the conditions of good and bad writing. GE credit: SocSci | SS.
(change in existing course—eff. winter 13)

191. Workshop in Contemporary Sociological Theory (4)
Lecture—2 hours; workshop—1 hour; term paper. Prerequisite: course 100 (former 165A) and senior standing. Workshop in contemporary sociological theory that allows students to explore the uses of theory in empirical inquiry on problems of interest to students. Contemporary theory considered in relation to social influences, concept formation, theory construction, and explanation. Not open for credit to students who have received credit for course 165B. GE credit: SocSci | SS.
(change in existing course—eff. winter 13)

193. Workshop in Field Research (2)
Lecture/discussion—2 hours. Prerequisite: course 46A, course 192 or 194A concurrently for two-hour units, senior standing. Preparation of a proposal for a study of the process of collecting, recording, analyzing, and reporting qualitative social data. Emphasis on application of principles, each participant completes an original research project. Not open for credit to students who have completed course 194A.
GE credit: SocSci | SS, WE.
(change in existing course—eff. winter 13)

194HB. Special Study for Honors Students (4)
Seminar—3 hours; term paper. Prerequisite: senior standing and admission to the Honors Program. Directed reading, research and writing culminating in the preparation of a Senior Honors Thesis under direction of faculty adviser. (Deferred grading only pending completion of sequence.) GE credit: SocSci | SS.
(change in existing course—eff. winter 13)

195. Special Topics in Sociological Analysis (4)
Seminar—3 hours; term paper. Prerequisite: upper division standing and consent of instructor. In-depth examination of topics in sociology. Emphasis on student research and writing. May be repeated for credit when topic differs. GE credit: SocSci | SS.
(change in existing course—eff. winter 13)

Soil Science

New and changed courses in Soil Science (SSC)

Upper Division

100. Principles of Soil Science (5)
(change in existing course—eff. winter 13)

102. Environmental Soil Chemistry (3)
Lecture—3 hours. Prerequisite: course 100 or the equivalent; general chemistry. Soil chemistry processes related to the fate and transport of contaminants in soil. Soil minerals, natural organic matter, surface charge, soil solution chemistry, redox reactions in soil, and sorption of inorganic and organic contaminants. GE credit: SciEng | QL, SE, SL—II. (II.) Parikh
(change in existing course—eff. winter 13)

105. Field Studies of Soils in California Ecosystems (5)
Prerequisite: courses 100 and 120, or equivalent recommended. Field-based studies of soils in California ecosystems, away from campus, throughout California. Emphasis on description and classification of soils; relationships among soils, vegetation, geology, and climate; physical, chemical, and biological processes in soils on the landscape; and the role of soils in land use. May be repeated one time for credit. GE credit: SciEng | QL, SE, SL, VL, WE—IV. (IV.) Amundson, Dahlgren, O’Geen, Southard
(change in existing course—eff. winter 13)

107. Soil Physics (5)
Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 100, Environmental and Resource Sciences 100, Mathematics 117A, or the equivalent. Physical properties of soil. Principles of water, gas, heat, and solute movement in soil with selected examples related to soil and water management. Influence of soil properties on transfer processes. GE credit: SciEng | W, II, IV, VB, III. (I.) Hoopmann
(change in existing course—eff. winter 13)

109. Sustainable Nutrient Management (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 100 or the equivalent. Availability of nutrients in organic and conventional agricultural, vineyard, and orchard and plantation forest soils; management of fertilizers, cover crops, compost, sewage sludge and manures for crop production and to prevent loss to the environment is emphasized. GE credit: SciEng | QL, QL, SE, SL, VL, WE—III. (III.) Horwath
(change in existing course—eff. winter 13)

111. Soil Microbiology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Chemistry 1C and Biological Sciences 1C. Major groups of microorganisms in soil, their interrelationships, and their responses to environmental variables. Role of microorganisms in cycling of nutrients. Plant-microbe relationships. Transformation of organic and inorganic pollutants. GE credit: SciEng | QL, SE, SL, WE—II. (II.) Scow
(change in existing course—eff. winter 13)

112. Soil Ecology (3)
(new course—eff. winter 14)

118. Soils in Land Use and the Environment (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or consent of instructor. Soils are considered as elements in land use planning and environmental quality. Topics include: soil survey reports, remote sensing, land capability classification, soil erosion/conservation, waste disposal on soils and soil reclamation. One one-day field trip. GE credit: SciEng | QL, SE, SL, VL—III, (III.) O’Geen
(change in existing course—eff. winter 13)

120. Soil Genesis, Morphology, and Classification (5)
Lecture—4 hours; laboratory—3 hours (includes five one-day weekend field trips). Prerequisite: course 100; Geology 50 recommended. Recognition and description of soils; chemical, biological and physical processes of soil formation. Factors of soil formation. Interactions of soils with diverse ecosystems. Introduction to soil classification. Practice using soil taxonomy. Practical experience describing soil properties in the field. GE credit: SciEng | QL, SE, SL, VL—III. (III.) Southard
(change in existing course—eff. winter 13)

Graduate

209. Physiology and Ecology of Mycorrhizal Symbioses (3)
(new course—eff. winter 14)

216. Physical Geochemistry (3)
(new course—eff. winter 14)

218. Soil Erosion and Conservation (3)
(new course—eff. winter 14)

Spanish

New and changed courses in Spanish (SPA)

Lower Division

2V. Elementary Spanish (5)
Web virtual lecture—3 hours; web electronic discussion—2 hours. Prerequisite: course 1, 1S, or previous high school Spanish language experience. Continuation of course 1, 1S, or previous high school experience in the areas of grammar and basic language skills. Online format combining synchronous chatting with technologically based materials. Not open for credit to students who have taken course 2, 2S, 2V, or higher. GE credit: SciEng | W—II, IV, VB, III, (III.) Blake
(change in existing course—eff. spring 13)

2VL. Elementary Spanish (5)
(cancelled course—eff. spring 13)

2Y. Elementary Spanish (5)
Lecture/discussion—3 hours; web electronic discussion—2 hours. Prerequisite: course 1 or 1S. Continuation of course 1 or 1S in the areas of grammar and basic language skills. Hybrid format combining classroom instruction with technologically based materials. Not open to students who have taken...
course 2 or 2S. GE credit: WC.—I, II, III, IV. (I, II, III, IV.) [new course—eff. spring 13]

2VL. Elementary Spanish (5) [canceled course—eff. spring 13]

3V. Elementary Spanish (5) [canceled course—eff. spring 13]

2VL. Elementary Spanish (5) [canceled course—eff. spring 13]

3V. Elementary Spanish (5) Web virtual lecture—3 hours; web electronic discussion—2 hours. Prerequisite: course 2, 2S, 2V, or 2V. Continuation of course 2, 2S, 2V, or 2V. Online format combining synchronous chatting with technologically based materials. Not open to students who have taken course 3, 3S, 3V, or higher. GE credit: WC.—I, II, III, IV. (I, II, III, IV.) [change in existing course—eff. spring 13]

3V. Elementary Spanish (5) Lecture/discussion—3 hours; web electronic discussion—2 hours. Prerequisite: course 3, 3S, or 3V. Continuation of courses 3 or 3S in the areas of grammar and basic language skills. Hybrid format combining classroom instruction with technologically based materials where learning takes place both face-to-face and online. Not open to students who have taken course 3 or 3S. GE credit: WC.—I, II, III, IV. (I, II, III, IV.) [new course—eff. spring 13]

21V. Intermediate Spanish (5) [canceled course—eff. fall 13]

21V. Intermediate Spanish (5) Lecture/discussion—3 hours; web electronic discussion—2 hours. Prerequisite: course 3, 3S, or 3V. Continuation of course 2, 2S, or 2V in the areas of grammar and basic language skills. Online format combining synchronous chatting with technologically based materials. Not open to students who have taken course 22 or 22S. Offered irregularly. GE credit: WC.—I, II, III, IV. (I, II, III, IV.) Blake, Bradley [new course—eff. fall 13]

22V. Intermediate Spanish (5) [in change existing course—eff. fall 13]

22V. Intermediate Spanish (5) Lecture/discussion—3 hours; web electronic discussion—2 hours. Prerequisite: course 21, 21S, or 21V. Continuation of course 21, 21S, or 21V in the areas of grammar and basic language skills. Online format combining synchronous chatting with technologically based materials. Not open to students who have taken course 21 or 21S. GE credit: WC.—I, II, III, IV. (I, II, III, IV.) [change in existing course—eff. fall 13]

Upper Division

100. Principles of Hispanic Literature and Criticism (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 24 or 24S or 33. Principles of literary criticism applied to the study of fiction, drama, poetry, and essay of major literary writers of the Hispanic world. Not open for credit to students who have completed course 100S. GE credit: ArtHum | AH, OL, WC, WE.—I, II, III, IV. (I, II, III, IV.) [change in existing course—eff. winter 13]

100S. Principles of Hispanic Literature and Criticism (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 24 or 24S. Principles of literary criticism applied to the study of fiction, drama, poetry, and essay of major literary writers of the Hispanic world. Offered in a Spanish speaking country under the supervision of a UC Davis faculty/lecturer. GE credit: ArtHum | AH, OL, WC, WE.—I, II, III, IV. (I, II, III, IV.) [change in existing course—eff. winter 13]

111N. The Structure of Spanish: Sounds and Words (3) Lecture—3 hours. Prerequisite: Linguistics 1 and course 24 or 24S, or consent of instructor. A linguistic description of the sound patterns of Spanish and how those sounds combine to form larger units, such as morphemes and words. Theoretical and practical comparisons with English and with other Romance languages. (Former course 132.) GE credit: SCoSci | SS.—I, II, III, IV. (I, II, III, IV.) [change in existing course—eff. winter 13]

112N. The Structure of Spanish: Words and Phrases (3) Lecture—3 hours. Prerequisite: course 111N. A study of Spanish word and phrase structure, with special emphasis on the constituent structure of noun and verb phrases. Theoretical and practical comparisons with English and with other Romance languages. (Former course 131.) GE credit: SCoSci | SS.—II, III, IV. (II, III, IV.) Blake, Colombe [change in existing course—eff. winter 13]

113. Spanish Pronunciation (4) Lecture—3 hours; term paper. Prerequisite: Linguistics 1 and course 24 or 24S. The sound structure of modern Spanish; theoretical analysis of selected problems in pronunciation. Strongly recommended for prospective teachers of Spanish. GE credit: SCoSci | SS.—II, III, IV. (II, III, IV.) Bradley [change in existing course—eff. winter 13]

114N. Contrasting Analysis of English and Spanish (4) Lecture—3 hours; extensive writing. Prerequisite: Linguistics 1 and course 24 or 24S, or consent of instructor; courses 111N and 112N recommended. Contrasting analysis of English and Spanish, error analysis, introduction to structural and transformational linguistics. Individual and group conferences. (Former course 137.) GE credit: SCoSci | SS.—II, III, IV. (III, IV.) Colombe [change in existing course—eff. winter 13]

115. History of the Spanish Language (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 24 or 24S, or consent of instructor. The Spanish language from its roots in spoken Latin to modernity. Emphasis on the close relationship between historical events and language change, and the role that literature plays in language standardization. Not open for credit to students who have completed course 115S. GE credit: ArtHum or SCoSci | AH or SS.—II, III, IV. (II, III, IV.) Blake [change in existing course—eff. winter 13]

115S. History of the Spanish Language (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 24 or 24S and Linguistics 1 or consent of instructor. The Spanish language from its roots in spoken Latin to modernity. Emphasis on the close relationship between historical events and language change, and the role that literature plays in language standardization. Offered in a Spanish speaking country under the supervision of a UC Davis faculty/lecturer. Not open for credit to students who have completed course 115S. GE credit: ArtHum or SCoSci | AH or SS.—II, III, IV. (II, III, IV.) [change in existing course—eff. winter 13]

116. Applied Spanish Linguistics (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: Linguistics 1 and course 24, 24S or 33, or consent of instructor. Exploration of the major theoretical and practical issues concerning learning Spanish as a second language. For students interested in teaching Spanish as a career. Offered in a Spanish speaking country, in Spanish, under the supervision of UC Davis faculty. Not open to students who have taken course 116S. Offered irregularly. GE credit: SCoSci | SS.—I, II, III, IV. (II, III, IV.) Blake, Colombe [change in existing course—eff. winter 13]

116S. Applied Spanish Linguistics (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: Linguistics 1 and course 24, 24S or 33, or consent of instructor. Exploration of the major theoretical and practical issues concerning learning Spanish as a second language. For students interested in teaching Spanish as a career. Offered in a Spanish speaking country, in Spanish, under the supervision of UC Davis faculty. Not open to students who have taken course 116S. Offered irregularly. GE credit: SCoSci | SS.—I, II, III, IV. (II, III, IV.) Blake, Colombe [new course—eff. fall 13]

118. Topics in Spanish Linguistics (4) Lecture—3 hours; term paper. Prerequisite: courses 111 and 112. A study of specialized topics in Spanish, for professional or personal purposes. GE credit: SCoSci | SS.—I, II, III, IV. (I, II, III, IV.) [change in existing course—eff. winter 13]

130. Survey of Spanish Literature to 1700 (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Survey of Spanish literature (narrative, poetry and drama) to 1700. Emphasis on the cultural birth of the Spanish culture, the formation and growth of the Spanish language and letters through its written records and the literature of the early period. GE credit: ArtHum | AH, WC.—I, II, III, IV. (I, II, III, IV.) Altisent [change in existing course—eff. winter 13]

131N. Survey of Spanish Literature to 1700 (4) Lecture—1.5 hours; performance instruction—1.5 hours. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Golden Age drama: text and performance. Study of Spanish Baroque drama as performance art. Close reading of plays and related aspects of seventeenth-century theater: theatrical spaces, staging, performance, actors, public, language, costumes. Final project is performance of a play. May be repeated twice for credit. Limited enrollment. Offered in alternate years. GE credit: ArtHum | AH, OL, VO, WE.—I, II, III, IV. (I, II, III, IV.) [change in existing course—eff. winter 13]

132. Golden Age Drama and Performance (4) Lecture—1.5 hours; performance instruction—1.5 hours. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Golden Age drama: text and performance. Study of Spanish Baroque drama as performance art. Close reading of plays and related aspects of seventeenth-century theater: theatrical spaces, staging, performance, actors, public, language, costumes. Final project is performance of a play. May be repeated twice for credit. Limited enrollment. Offered in alternate years. GE credit: ArtHum | AH, OL, VO, WE.—I, II, III, IV. [change in existing course—eff. winter 13]

133N. Golden Age Literature of Spain (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Introduction to the study of the principal authors and literary movements of 16th- and 17th-century Spain and Spanish American colonial literature. May be repeated three times for credit with consent of instructor. GE credit: ArtHum | AH, OL, WE.—I, II, III, IV. (I, II, III, IV.) Martin [change in existing course—eff. winter 13]
134A. Don Quijote I (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Critical interpretation of Don Quijote Part One by Cervantes. Focused study of key elements within the socio-cultural context of Golden Age Spain. Don Quijote as prototype for the modern novel. Offered in alternate years. GE credit: ArtHum | AH, WC, WE—(II, III) Altsin, Armistead, Martín-Matute, Peluffo, Zornes

{change in existing course—eff. winter 13}

134B. Don Quijote II (4) Lecture—3 hours; term paper. Prerequisite: course 134A. Critical interpretation of Don Quijote Part Two by Cervantes. Focused study of key elements within the socio-cultural context of Golden Age Spain. Don Quijote as prototype for the modern novel. Offered in alternate years. GE credit: ArtHum | AH, WC, WE—(II) Altsin

{change in existing course—eff. winter 13}

135N. Spanish Romanticism (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Spanish Romanticism as a philosophical concept, and as a literary movement in Spain, with emphasis on its distinctive, specific "romantic" qualities and its literary expression in five leading authors of the early nineteenth century. (Former course 114.) GE credit: ArtHum | AH, WC, WE—(II) Altsin

{change in existing course—eff. winter 13}

136N. The Spanish Novel of the 19th Century (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Study of the main literary trends and authors of modern and contemporary Spanish poetry. Selected works by Machado, Juan Ramón Jiménez, García Lorca, Guíllén, Aleixandre, Hernández Hierro and others. GE credit: ArtHum | AH, WC, WE—(III) Altsin

{change in existing course—eff. winter 13}

137N. Twentieth-Century Spanish Fiction (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Study of the main literary trends and authors of modern and contemporary Spanish literature. Selected works by Unamuno, Valle-Inclán, Sender, Cela, Matute, Ayala and others. GE credit: ArtHum | AH, WC, WE—(III) Altsin

{change in existing course—eff. winter 13}

138N. Modern and Contemporary Spanish Poetry (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Study of the main literary trends and authors of modern and contemporary Spanish poetry. Selected works by Machado, Juan Ramón Jiménez, García Lorca, Guíllén, Aleixandre, Hernández Hierro and others. GE credit: ArtHum | AH, WC, WE—(III) Altsin

{change in existing course—eff. winter 13}

140N. Modern Spanish Essay (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Modernism as an authentic expression of Latin American literature and its influence on 20th-century poetry and prose. In depth analysis of the works of Dario and other major writers of the era. Offered in alternate years. GE credit: ArtHum | AH, WC, WE—(II) Altsin

{change in existing course—eff. winter 13}

142. Special Topics in Spanish Cultural and Literary Studies (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Special topics in the study of Spanish literature and culture. May be repeated two times for credit. GE credit: ArtHum | AH, OL, WC

{change in existing course—eff. winter 13}

150N. Survey of Latin American Literature to 1900 (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Latin American literature from preconquest texts and the chronicles of the Conquest to romanticism and modernism. Reading selections include fiction, poetry, drama, and essays. GE credit: ArtHum | AH, WC, WE—(II) Bejel, Irwin, Lazzara, Peluffo

{change in existing course—eff. winter 13}

151. Survey of Latin American Literature 1900 to Present (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Latin American literature from 1900 to the present. Reading selections include fiction, poetry, drama, essays, testimonio, etc. GE credit: ArtHum | AH, WC, WE—(II) Bejel, Irwin, Lazzara, Peluffo

{change in existing course—eff. winter 13}

151N. Spanish-American Literature 1900 to Present (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Spanish literature from Modernism to the present. Reading selections include fiction, poetry, drama, and essays. (Former course 1058.) GE credit: ArtHum | AH, WC, WE—(II) Bejel, Irwin, Lazzara, Peluffo

{change in existing course—eff. winter 13}

153. Latin American Short Story (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Evolution of the Latin American short story from the 19th century to the present. Emphasis on the contemporary period. Offered in alternate years. GE credit: ArtHum | AH, WC, WE—(II) Bejel, Irwin, Ortiz

{change in existing course—eff. winter 13}

154. Latin American Novel (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Evolution of the Latin American novel from the 19th century to the present. Emphasis on contemporary works. Offered in alternate years. GE credit: ArtHum | AH, WC, WE—(II) Bejel, Irwin, Lazzara, Peluffo

{change in existing course—eff. winter 13}

155. Mexican Novel (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Evolution of the Mexican novel from the 19th century to the present. Emphasis on late significant contemporary works. GE credit: ArtHum | AH, WC, WE—(II) Bejel, Irwin, Lazzara, Peluffo

{change in existing course—eff. winter 13}

156. Latin American Literature of the Turn of the 20th Century (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Modernism as an authentic expression of Latin American literature and its influence on 20th-century poetry and prose. In depth analysis of the works of Dario and other major writers of the era. Offered in alternate years. GE credit: ArtHum | AH, WC, WE—(II) Bejel, Irwin, Lazzara, Peluffo

{change in existing course—eff. winter 13}

157. Great Works of Latin American Literature/Culture (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Study of major works of Latin American literature and culture. May include novels, poetry, film, etc. Works may be analyzed in terms of style, influence, cultural signifi-
credit if content differs. Limited enrollment. GE credit: ArtHum | AH, OL, WE.—II. (II.) Allsient, González, Martin, Martínez-Carazo
[change in existing course—eff. winter 13]

182. Senior Seminar in Latin American Literature/Culture (4)
Seminar—3 hours; term paper—1 hour. Prerequisite: senior standing; a major in Spanish or consent of instructor. Group study of a special topic drawn from Latin American literary and cultural studies. Independent research project. May be repeated one time for credit if content differs. Limited enrollment. GE credit: ArtHum | AH, OL, WE, —II, III (III.) Beijel, Egan, Irwin, Lazzara, Peluffo
[change in existing course—eff. winter 13]

194H. Special Study for Honors Students (1-5)
Independent Study—3–15 hours. Prerequisite: Senior standing and qualification for the Spanish honors program. Guided research, under the direction of a faculty member, leading to a senior honors thesis on a topic in Spanish literature, civilization, or language studies. May be repeated for up to 8 units of credit. (P/NP grading only.) GE credit: AH, WC, WE.
[change in existing course—eff. winter 13]

198. Directed Group Study (1-5)
Prerequisite: consent of instructor and Department Chairperson. (P/NP grading only.) GE credit: AH, WC, WE.
[change in existing course—eff. winter 13]

199. Special Study for Advanced Undergraduates (1-5)
May be repeated for up to 6 units of credit (P/NP grading only.) GE credit: AH, WC, WE.
[change in existing course—eff. winter 13]

Graduate

203. Research Methodologies (1)
Seminar—2 hour. Introduction to the range of scholarly research methodologies currently being realized in Spanish linguistics, literary and cultural studies; archival research, textual analysis, discourse analysis, statistics for linguistics, etc.; introduction to scholarly writing (MLA style) and scholarly publishing. (S/ U grading only) —II. (II) Allsient, Beijel, Bernucci, Blake, Cararo, Colombi, Egan, Irwin, Martin, Martínez-Lazzara, Newcomb, Peluffo
[change in existing course—eff. fall 13]

Statistics

New and changed courses in Statistics (STA)

Lower Division

13V. Elementary Statistics (4)
Lecture—1.5 hours; web virtual lecture—5 hours. Prerequisite: two years of high school algebra or the equivalent in college. Descriptive statistics; basic probability; binomial, normal, Student’s t, chi-square distributions. Hypothesis testing and confidence intervals for one and two means and proportions. Regression. Not open for credit for students who have completed course 103, or higher. GE credit: SciEng | QL, SE.—I, II. (II) Uts
[new course—eff. fall 13]

Upper Division

130A. Mathematical Statistics: Brief Course (4)
Lecture—2 hours; discussion—1 hour. Prerequisite: Mathematics 16B. Basic probability, densities and distributions, mean, variance, covariance, Chebyshev’s inequality, some special distributions, sampling distributions, central limit theorem and law of large numbers, point estimation, some methods of estimation, interval estimation, confidence intervals for certain quantities, computing sample sizes. Only 2 units of credit allowed to students who have taken course 131A. GE credit: SciEng | QL, SE.—II. (II) [change in existing course—eff. winter 13]

130B. Mathematical Statistics: Brief Course (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 130A. Transformed random variables, large sample properties of estimates. Basic ideas of hypothesis testing, likelihood ratio tests, goodness-of-fit tests. General linear model, least squares estimates, Gauss-Markov theorem. Analysis of variance, F-test. Regression and correlation, multiple regression. Selected topics. GE credit: SciEng | QL, SE.—II. (II) [change in existing course—eff. winter 13]

131A. Introduction to Probability Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 21A, 21B, 21C, and 22A. Fundamentnal concepts of probability theory, discrete and continuous random variables, standard distributions, moments and moment-generating functions, laws of large numbers and the central limit theorem. Not open for credit to students who have completed Mathematics 155A. GE credit: SciEng | QL, SE.—II, III, IV, (I, II, III, IV) [change in existing course—eff. winter 13]

131B. Introduction to Mathematical Statistics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 131A or consent of the instructor. Sampling, methods of estimation, sampling distributions, confidence intervals, testing hypotheses, linear regression, analysis of variance, elements of large sample theory and nonparametric inference. GE credit: SciEng | QL, SE.—II, III, IV, (I, II, III, IV) [change in existing course—eff. winter 13]

131C. Introduction to Mathematical Statistics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 131B, or consent of the instructor. Sampling, methods of estimation, sampling distributions, confidence intervals, testing hypotheses, linear regression, analysis of variance, elements of large sample theory and nonparametric inference. GE credit: SciEng | QL, SE.—II, III, IV, (I, II, III, IV) [change in existing course—eff. winter 13]

133. Mathematical Statistics for Economists (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 103 and Mathematics 16B, or the equivalent; no credit will be given to students majoring in Statistics. Probability, basic properties; discrete and continuous random variables (binomial, normal, t, chi-square); expectation, variance of a random variable; bivariate random variables (bivariate normal); sampling distributions; central limit theorem; estimation, maximum likelihood principle; basic ideas of hypothesis testing (one-sample). GE credit: SciEng | QL, SE.—I, II (I) [change in existing course—eff. winter 13]

135. Multivariate Data Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 130B, and preferably course 131B. Multivariate normal distribution; Mahalanobis distance; sampling distributions of the mean vector and covariance matrix; Hotelling’s T^2; simultaneous infer-
ence; one-way MANOVA; discriminant analysis; principal components; canonical correlation; factor analysis. Intensive use of computer analyses and real data sets. GE credit: SciEng | QL, SE.—II. (III) [change in existing course—eff. winter 13]

137. Applied Time Series Analysis (4)
Lecture—3 hours; term paper. Prerequisite: course 108 or the equivalent. Time series relationships, cyclical behavior, periodicity, spectral analysis, coherence, filtering, regression, ARIMA and state-space models; Applications to data from economics, engineering, medicine, environment using time series software. GE credit: SciEng | QL, SE.—II. (III) [change in existing course—eff. winter 13]

141. Statistical Computing (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: one introductory class in Statistics (such as 13, 32, 100, or 102), or the equivalent. Organization of computations to access, transform, explore, analyze data and produce results. Concepts and vocabulary of statistical/scientific computing. GE credit: SciEng | QL, SE. [change in existing course—eff. winter 13]

142. Reliability (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: courses 130A and 130B, or 131A and 131B, or the equivalent. Subjective probability, Bayes Theorem, conjugate priors, non-informative priors, estimation, testing, prediction, empirical Bayes methods, properties of Bayesian procedures, comparisons with classical procedures, approximation techniques, Gibbs sampling, hierarchical Bayesian analysis, applications, computer implemented data analysis. Offered in alternate years. GE credit: SciEng | QL, SE. [change in existing course—eff. winter 13]

145. Bayesian Statistical Inference (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: courses 130A and 130B, or 131A and 131B, or the equivalent. Subjective probability, Bayes Theorem, conjugate priors, non-informative priors, estimation, testing, prediction, empirical Bayes methods, properties of Bayesian procedures, comparisons with classical procedures, approximation techniques, Gibbs sampling, hierarchical Bayesian analysis, applications, computer implemented data analysis. Offered in alternate years. GE credit: SciEng | QL, SE. [change in existing course—eff. winter 13]

194HA-194HB. Special Studies for Honors Students (4-4)
Independent study—12 hours. Prerequisite: senior qualifying for honors. Directed reading, research and writing, culminating in the completion of a senior honors thesis or project under direction of a faculty adviser. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE. [change in existing course—eff. winter 13]

Study of Religion
(A Graduate Group)

New and changed courses in Study of Religion (REL)

Graduate

200A. Historical Roots of the Study of Religion (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Consideration of the historical and philosophical formation of religion as a concept. Treats the emergence of religion as a category of analysis and understanding from the Reformations through the Enlightenment.—I. (I) Chin, Coudert, Elmore, Janowitz (new course—eff. fall 13)
200B. Foundational Theories of Religion (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Survey of classical 19th and 20th century approaches to the study of religion. — II. (II.) Chin, Caudert, Elmore, Janowitz (new course—eff. fall 13)

200C. Contemporary Approaches to the Study of Religion (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Consideration of major themes, issues and methods in the contemporary study of religion. Perspectives from diverse cultural settings employed to consider modern historical, philosophical, and social contexts that inform understandings of religion. — III. (III.) Chin, Elmore, Janowitz (new course—eff. fall 13)

200D. Field Profile Seminar I and II (1-2)
Project. Prerequisite: graduate standing or consent of instructor. Individually guided research to survey the field of study, under the supervision of a faculty member. Four units total over two or more quarters are required by the end of the second year. May be repeated for credit. — I, II, III, (I, II, III.) (new course—eff. fall 13)

210A. Special Topics in American Religious Cultures (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of specific topics in American religious cultures. May be repeated for credit when topic differs. — I, II, III, (I, II, III.) (new course—eff. fall 13)

210B. Special Topics in Asian Religious Cultures (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of specific topics in Asian religious cultures. May be repeated for credit when topic differs. — I, II, III, (I, II, III.) (new course—eff. fall 13)

210C. Special Topics in Mediterranean Religious Cultures (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of specific topics in Mediterranean religious cultures. May be repeated for credit when topic differs. — I, II, III, (I, II, III.) (new course—eff. fall 13)

230A. Thematic Topics - Body and Praxis (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of religion through specific topics and themes relating to the body and praxis. May be repeated for credit when topic differs. — I, II, III, (I, II, III.) (new course—eff. fall 13)

230B. Thematic Topics - Language, Rhetoric, and Performance (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of religion through specific topics and themes relating to language, rhetoric, and performance. May be repeated for credit when topic differs. — I, II, III, (I, II, III.) (new course—eff. fall 13)

230C. Thematic Topics - Modernity, Science, and Secularism (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of religion through specific topics and themes relating to modernity, science, and secularism. May be repeated for credit when topic differs. — I, II, III, (I, II, III.) (new course—eff. fall 13)

230D. Thematic Topics - Theory and Method (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of religion through specific topics and themes relating to theory and method. May be repeated for credit when topic differs. — I, II, III, (I, II, III.) (new course—eff. fall 13)

230E. Thematic Topics - Values, Ethics, and Human Rights (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of religion through specific topics and themes relating to values, ethics, and human rights. May be repeated for credit when topic differs. — I,II, III, (I, II, III.) (new course—eff. fall 13)

231E. History, Theory and Criticism of Human Rights (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Restricted to graduate students. Introduces the advanced study of Human Rights and the theoretical and practical elaboration of the international Human Rights system. Seminar will engage with criticism of Human Rights and develop research and teaching within disciplinary and interdisciplinary frameworks. (Same course as Human Rights 200A.)— I, II. (I, II.) Watenpaugh (new course—eff. fall 13)

298. Group Study (1-5)
Prerequisite: graduate standing or consent of instructor. May be repeated for credit. (S/U grading only.)— I, II, III, (I, II, III.) (new course—eff. fall 13)

299. Research (1-12)
Prerequisite: graduate standing or consent of instructor. May be repeated for credit. (S/U grading only.)— I, II, III, (I, II, III.) (new course—eff. fall 12)

299D. Dissertation Writing (1-12)
Prerequisite: advanced to candidacy for the Ph.D. program; consent of instructor. May be repeated for credit. (S/U grading only.)— I, II, III, (I, II, III.) (new course—eff. fall 13)

Sustainable Agriculture and Food Systems

New and changed courses in Sustainable Agriculture and Food Systems (SAF)

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: consent of instructor. Restricted to Sustainable Agriculture and Food Systems majors or with consent of instructor. Lower-division internship for students enrolled in the Sustainable Agriculture and Food Systems program. Enrollment for non-majors by consent of instructor. May be repeated up to 12 units for credit with consent of instructor. (P/NP grading only.)— I, II, III, (I, II, III.) Galt, Horwath, Tomich, Van Horn (new course—eff. fall 13)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. Restricted to Sustainable Agriculture and Food Systems major or with consent of instructor. Group study on focused topics in Sustainable Agriculture and Food Systems. Varies according to instructor. Course plan is adapted to student need and interest in conjunction with the expertise of the instructor. Offered irregularly. (P/NP grading only.)— I, II, III, (I, II, III.) (new course—eff. fall 13)

99. Special Study for Undergraduates (1-5)
Independent study—3-15 hours. Prerequisite: consent of instructor. Under faculty supervision, students pursue a special or individualized course of study related to Sustainable Agriculture and Food Systems. May be repeated for credit. (P/NP grading only.)— I, II, III, (I, II, III.) (new course—eff. fall 13)

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: upper-division standing; consent of instructor. Restricted to Sustainable Agriculture and Food Systems majors or with consent of instructor. Upper-division internship for students enrolled in the Sustainable Agriculture and Food Systems program of study. Enrollment for non-majors by consent of instructor. May be repeated up to 12 units for credit. (P/NP grading only.)— I, II, III, (I, II, III.) Galt, Horwath, Tomich, Van Horn (new course—eff. fall 13)

1977. Tutoring in Sustainable Agriculture and Food Systems (1-5)
Tutorial—3-15 hours. Prerequisite: upper division standing; consent of instructor. Undergraduates assist the instructor by tutoring students in regularly scheduled courses that fulfill S&F major requirements. May be repeated for credit. Offered irregularly. (P/NP grading only.)— I, II, III, (I, II, III.) (new course—eff. fall 13)

197 TC. S&FS Tutoring in the Community (1-5)
Tutorial—3-15 hours. Prerequisite: upper division standing; consent of instructor. Undergraduates assist the instructor by tutoring in the community in settings related to Sustainable Agriculture and Food Systems. May be repeated for credit. Offered irregularly. (P/NP grading only.)— I, II, III, (I, II, III.) (new course—eff. fall 13)

198. Directed Group Study (1-5)
Prerequisite: upper division standing; consent of instructor. Restricted to Sustainable Agriculture and Food Systems major or with consent of instructor. Group study on focused topics in Sustainable Agri-
Technocultural Studies

New and changed courses in Technocultural Studies (TCS)

Lower Division

5. Media Archaeology (4)
Lecture/discussion—3 hours; term paper. Evolution of media technologies and practices beginning in the 19th Century as they relate to contemporary digital arts practices. Special focus on the reconstruction of the social and artistic possibilities of lost and obsolete media technologies. GE credit: ArtHum or SciEng | AH or SE, VL, WE.
(change in existing course—eff. winter 13)

Upper Division

155. Introduction to Documentary Studies (4)
Lecture/discussion—3 hours; term paper. Recent evolution of the documentary. The personal essay film; found-footage/appropriation work; non-linear, multi-media forms; spoken word; storytelling; oral history recordings; and other examples of documentary expression. GE credit: ArtHum | ACGH, AH, DD, VL.—I. (I) Drew
(change in existing course—eff. winter 13)

158. Technology and the Modern American Body (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 1 and either American Studies 1 or 5. The changing role of the relationships between human bodies and technologies in modern society. Dominant and eccentric examples of how human bodies and technologies influence one another and reveal underlying cultural assumptions. (Same course as American Studies 158.) GE credit: ArtHum | ACGH, AH, WE.—de la Pená
(change in existing course—eff. fall 11)

Lecture—3 hours; extensive writing or discussion—1 hour. Historical, aesthetic and critical approaches to how information technologies produced ghost effects or a sense of terror in response to new media like the photograph, gramophone, film, typewriter, computer, Turing Machine. Focus on technological media transforms sense perception. Offered in alternate years. [Same course as Science and Technol- ogy Studies 160.] GE credit: ArtHum or SocSci | ACGH, AH or SS, VL, WE.—Ravetto-Biagioli
(new course—eff. fall 13)

173. Principles of Fashion Marketing (3)
Lecture—3 hours. Prerequisite: course 8, Economics 1A, Agricultural and Resource Economics 113 or 136. Study of basic elements of fashion marketing including philosophy and objectives, organization, merchandising, pricing, promotion and personnel. Offered in alternate years. GE credit: SocSci | SS, VL.—III. Rucker
(change in existing course—eff. winter 13)

180A-180B. Introduction to Research in Textiles (2-2)
Laboratory—6 hours. Prerequisite: senior standing with textile-related major, and consent of instructor. Senior thesis on independent problems. Research begun in course 180A will be continued and completed in course 180B. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SS, WE.—II, III, III, III, III
(change in existing course—eff. winter 13)

Transportation Technology and Policy

Graduate

200. Transportation Survey Methods (4)
Lecture—4 hours. Prerequisite: Statistics 13; Civil and Environmental Engineering 251 recommended. Description of types of surveys commonly used in transportation demand modeling, including travel and activity diaries, attitudinal, panel, computer, and stated-response surveys. Discussion of sampling, experimental design, and survey design issues. Analysis methods, including factor, discriminant and cluster analysis. Not open for credit to students who have taken Civil and Environmental Engineering 255. [Same course as Geography 281.]—II. Malikhatian
(change in existing course—eff. fall 12)

220. Transportation Planning and Policy (4)
Lecture/discussion—4 hours. Limited enrollment. Transportation planning process at the regional level, including the role of federal policy in shaping regional transportation planning, tools and techni- ques used in regional transportation planning, issues facing regional transportation planning agen- cies, pros and cons of potential solutions and strate- gies. Students having taken this course previously as course 289 do not repeat it for credit; having taken other course 289 offerings does not preclude taking this course for credit. [Same course as Geography 236.] Offered in alternate years.—III. Handy
(change in existing course—eff. winter 13)

UC Davis Washington Center

New and changed courses in UC Davis Washington Center (WAS)

Upper Division

193. Washington Center Research Seminar (4)
Lecture/discussion—1 hour; independent study—3 hours; tutorial—0.5 hour. Prerequisite: course 192 concurrently. Core academic component of Wash- ington Thesis Program. Topics coordinated with internships. Research draws on resources uniquely available in
New and changed courses in University Writing Program (UWP)

Lower Division

1. Expository Writing (4)
Lecture/discussion—4 hours. Prerequisite: completion of Entry-Level Writing Requirement. Composition, the essay, paragraph structure, diction, and related topics. Frequent writing assignments. GE credit: ArtHum, Wrt | AH, WE.—I, II, III, IV, [new course—fall 13]

2. Developmental Writing in the Disciplines: Biology (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to majors in biology or to students concurrently enrolled in an upper division biology course. Advanced instruction in writing in biology. Not open for credit to students who have completed English 102B. GE credit: ArtHum, Wrt | AH, WE.—I, II, III, [new course—fall 13]

3. Expository Writing (4)
Lecture/discussion—2 hours; web electronic discussion—2 hours. Prerequisite: completion of Entry-Level Writing Requirement. Composition, the essay, paragraph structure, diction, and related topics. Frequent writing assignments. Not open to students who have taken course 1 or 1Y. GE credit: ArtHum, Wrt | AH, WE.—I, II, III, IV, [new course—fall 13]

4. Intermediate Reading and Writing for Non-Native Speakers (4)
Lecture/discussion—4 hours. Prerequisite: an individual evaluation completed in the 114 course. Provides an opportunity for the study of reading and writing. GE credit: ArtHum, Wrt | AH, WE.—II, III, IV, [new course—fall 13]

5. Writing in the Disciplines: History (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to majors in history or to students concurrently enrolled in an upper division course accepted for the history major. Advanced instruction in writing in history. GE credit: ArtHum, Wrt | AH, WE.—I, II, III, IV, [new course—fall 13]

6. Writing in the Disciplines: International Business (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to upper division students in the College of Engineering and to students enrolled in an upper division engineering or computer science course for the major. Advanced instruction in writing in engineering. GE credit: ArtHum, Wrt | AH, WE.—I, II, III, IV, [new course—fall 13]

7. Writing in the Disciplines: Environmental Writing (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to students with upper division coursework with an environmental focus. Advanced instruction in writing and practice in effective styles of communication in the fields of environmental study, policy, or advocacy. Not open for credit to students who have completed course 102A in the same academic field. GE credit: ArtHum, Wrt | AH, WE.—I, II, III, IV, [new course—fall 13]

8. Writing in the Disciplines: Human Development and Psychology (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to majors in human development and psychology or to students concurrently enrolled in an upper division course in human development or psychology. Advanced instruction in writing and practice in effective styles of communication in Human Development and Psychology. Not open for credit to students who have completed course 102A in the same academic field. GE credit: ArtHum, Wrt | AH, WE.—I, II, III, IV, [new course—fall 13]

Quarter Offered: I—Fall; II—Winter; III—Spring; IV—Summer. 2013-2014 offering in parentheses.

Fall 2011 and on General Education (GE): AEH=Arts and Humanities; SS=Science and Engineering; SS=Social Sciences; AC=American Cultures; DD=Domestic Diversity; Wrt=Writing Experience
110. Specialized Genres in Professional Writing (4)
Lecture/discussion—3 hours; extensive writing. Pre-requisite: satisfaction of the upper-division writing requirement. Restricted to upper-division students who have satisfied the upper-division writing requirement. Counts toward the writing minor. Instruction in the elements and practices of professional writing in specialized genres. Offered irregularly. GE credit: ArtHum, Wrt | AH, WE.
(change in existing course—eff. winter 13)

111. Specialized Topics in Journalism: Investigative Journalism (4)
Lecture/discussion—3 hours; extensive writing. Pre-requisite: satisfaction of the upper-division writing requirement. Restricted to upper-division students with a strong interest in journalism. Counts toward the writing minor. Instruction in the elements and practices of investigative journalism. May be repeated one time for credit if specialized journalism topic for each course differs. Offered irregularly. GE credit: ArtHum, Wrt | AH, WE.
(change in existing course—eff. winter 13)

111A. Specialized Topics in Journalism: Investigative Journalism (4)
Lecture/discussion—3 hours; extensive writing. Pre-requisite: satisfaction of the upper-division writing requirement. Restricted to upper-division students with a strong interest in journalism. Counts toward the writing minor. Instruction in the elements and practices of investigative journalism. May be repeated one time for credit if specialized journalism topic for each course differs. Offered irregularly. GE credit: ArtHum, Wrt | AH, WE.
(change in existing course—eff. winter 13)

112. History of Scientific Writing (4)
Lecture/discussion—3 hours; extensive writing. Pre-requisite: upper-division standing. History of scientific writing from the 17th century to the present; origins and evolution of scientific genres; role of scientific writing in producing scientific knowledge; discursive differences between disciplines; emergence of English as a global language of science. Offered in alternate years. GE credit: ArtHum or SciEng | AH or SE, SL, WE.—(III.) Andersen, Flynn, Haynes, Ferrault, Whithaus
(new course—eff. fall 13)

192. Internship in Writing (1-12)
Internship—3.6 hours. Prerequisite: course 1 or English 3 or the equivalent. Internships in fields where students can practice their skills. May be repeated up to 12 times for credit. (P/NP grading only.) GE credit: AH.
(change in existing course—eff. winter 13)

197. Tutoring in Writing (1-5)
Tutoring—1-5 hours. Prerequisite: upper-division standing; consent of instructor. Tutoring one-on-one or in small voluntary discussion groups affiliated with a writing course. May be repeated up to 10 times for credit. (P/NP grading only.) GE credit: AH.
Veterinary Medicine: Population Health and Reproduction

New and changed courses in Veterinary Medicine: Population Health and Reproduction (PHR)

Graduate
251. Food and Waterborne Safety (2)
Lecture/discussion—2 hours. Prerequisite: MPVM or graduate student standing. Direct experience with food and waterborne diseases. Topics will cover bacteria, parasites, and toxins from environmental and animal sources that impact food and water safety at the interface of livestock health and the food chain. —II. (II.) Weimer
(new course—fall 13)

Viticulture and Enology

New and changed courses in Viticulture and Enology (VEN)

Upper Division
101C. Viticultural Practices (3)
Lecture—1.5 hours; discussion/laboratory—3.5 hours. Prerequisite: course 2. Field oriented experience in the principles and practices of grapevine production, including vineyard establishment, vine training, trellising, canopy management practices, irrigation and water management, and methods of crop adjustment for improvement of fruit quality. One field trip required. GE credit: SciEng | SE.—II. (III.) Smart
(change in existing course—eff. winter 13)

110L. Critical Evaluation of Wines of the World (1)
Laboratory/discussion—3 hours. Prerequisite: course 111 (must be taken concurrently, course 125 with a grade of C or better). Critical analysis of wines produced in different parts of the world with emphasis on the relationship between sensory properties of the wines and factors associated with their place of origin. (P/NP grading only.) GE credit: SE. —I. (I.) Williams
(change in existing course—eff. winter 13)

115. Raisin and Table Grape Production (2)
Lecture—2 hours. Prerequisite: course 2. Overview of the raisin and table grape industries in California and other production areas of the world. Cultural practices associated with raisin and table grape production will also be discussed. GE credit: SciEng | SE.—I. (I.) Williams
(change in existing course—eff. winter 13)

123. Analysis of Musts and Wines (2)
Lecture—2 hours. Prerequisite: Chemistry 2C and 8B or equivalent; Agricultural Management and Range Land Resources 21, or equivalent. GE credit: SciEng, Wrt | QL, SE, VL, WE.—I. (I.) Ebeler
(change in existing course—eff. winter 13)

124. Wine Production (2)
Lecture—2 hours. Prerequisite: course 3, 123 (may be taken concurrently). Biological Sciences 102. Principles and practices of making standard types of wines, with special reference to grape varieties used and methods of vinification. GE credit: SciEng | SE, VL, WE.—I. (I.) Bisson
(change in existing course—eff. winter 13)

124L. Wine Production Laboratory (3)
Laboratory—3 hours; independent study—3 hours; term paper. Prerequisite: course 124 (may be taken concurrently). Restricted to undergraduate students in fermentation science, viticulture and enology, bio technology, microbiology, food science and applied plant biology or graduate students in food science, agricultural and environmental chemistry and horticulture. Current technologies used in production of current viticultural practices in different parts of the world, including California. GE credit: SciEng | OL, SE, WE.
(change in existing course—eff. winter 13)
California table wines; analysis and monitoring of impact of fermentation variables on microbial performance and quality; student-designed independent research project. GE credit: SciEng | OL, SE, WE. —I. (I.) Bisson

change in existing course—eff. winter 13

125. Wine Types and Sensory Evaluation (2)
Lecture—2 hours. Prerequisite: course 124; Plant Sciences, 120 or Statistics 106. Open to upper division and graduate students in Viticulture & Enology; others by approval of instructor. Principles of sensory evaluation and application to wines. Factors influencing wine flavor. Data from sensory analysis of model solutions. GE credit: SciEng | QL, SE. —III. (III.) Heymann

change in existing course—eff. winter 13

125L. Sensory Evaluation of Wine Laboratory (2)
Laboratory—3 hours; term paper. Prerequisite: course 125 may be taken concurrently. Restricted to upper division majors in fermentation science or viticulture and enology or graduate students in food science. Sensory evaluation of wines and model systems; data analysis, tests, ranking, descriptive analysis, and time-intensity analysis. Data analyzed by appropriate statistical tests and results interpreted in weekly lab reports. GE credit: SciEng | QL, SE, WE, VL. —III. (III.) Heymann

change in existing course—eff. winter 13

126. Wine Stability (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 124. Restricted to students in viticulture and enology, fermentation science, applied plant biology majors, or graduate students in food science, microbiology, biotechnology, and agriculture. Principles of equilibria and rates of physical and chemical reactions in wines; treatment of unstable components in wines by absorption, ion exchange, refrigeration, filtration, and membrane processes; and protein, polysaccharide, tartrate, oxidative, and color stabilities. GE credit: SciEng | SE. —II. (II.) Boulton

change in existing course—eff. winter 13

126L. Wine Stability Laboratory (2)
Laboratory—3 hours; independent study—3 hours. Prerequisite: course 126 may be taken concurrently. Restricted to upper division fermentation science, viticulture and enology majors, or graduate students in food science, agricultural and environmental chemistry, microbiology, and agronomy. GE credit: SciEng | SE. —II. (II.) Boulton

change in existing course—eff. winter 13

128. Wine Microbiology (2)
Lecture—2 hours. Prerequisite: courses 123 and 124; Microbiology 102 and 102L, or Food Science and Technology 104 and 104L. courses 125 and 126 recommended. Nature, development, physiology, biochemistry, and control of yeasts and bacteria involved in the making, aging, and spoilage of wine. GE credit: SciEng | SE, VL, WE, VL. —II. (II.) Mills

change in existing course—eff. winter 13

128L. Wine Microbiology Laboratory (2)
Laboratory—6 hours. Prerequisite: courses 123, 124, and 128 may be taken concurrently. Microbiology 102L or Food Science and Technology 104 and 104L; course 125 and 126 recommended. Restricted to upper division students in fermentation science, viticulture and enology or graduate students in food science. Nature, development, physiology, biochemistry, and control of yeasts and bacteria involved in the making, aging, and spoilage of wine. GE credit: SciEng | SE, VL, WE. —II. (II.) Mills

change in existing course—eff. winter 13

135. Wine Technology and Winery Systems (5)
Lecture—3 hours; discussion/laboratory—2 hours. Prerequisite: course 124. Process technologies and process systems that are used in commercial wineries. Lectures, demonstrations, problem solving sessions, and possible field trips. Includes grape preparation and fermentation equipment; post-fermentation processing equipment; winery utilities, cleaning systems, and waste treatment. GE credit: SciEng | SE, WE. —II. (II.) Boulton

change in existing course—eff. winter 13

140. Distilled Beverage Technology (3)
Lecture—3 hours. Prerequisite: Chemistry B6, Food Science and Technology 110A. Distillation principles and practices; production technology of brandy, whiskey, rum, vodka, gin, and other distilled beverages; characteristics of raw materials, fermentation, distillation, and aging. Offered in alternate years. GE credit: SciEng | QL, SE, WE, VL. —III. (III.) Mills

change in existing course—eff. winter 13

181. Readings in Enology (1)
Discussion—1 hour. Prerequisite: course 3. Critical evaluation of selected monographs in enology. Discussion leads to student presentations. May be repeated three times for credit. (P/NP grading only.) GE credit: SE. —II. (II.) Matthews

change in existing course—eff. winter 13

190X. Winemaking Seminar (1)
Seminar—1 hour; discussion—1 hour. Prerequisite: course 3. Open to Viticulture and Enology majors and graduate students. Outside speakers on a specific winemaking subject. GE credit: SciEng | SE. —III. (III.) Boulton

change in existing course—eff. winter 13

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: completion of 84 units. Work experience related to Fermentation Science (Enology) or Plant Science (Viticulture) majors. Internships must be approved and supervised by a member of the department or major faculty, but are arranged by the student. (P/NP grading only.) GE credit: SE. —II. (II.) Boulton

change in existing course—eff. winter 13

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.) GE credit: SE. —II. (II.) Boulton

change in existing course—eff. winter 13

Graduate
216. Sustainable Vineyard Development (5)
Lecture/discussion—3 hours; fieldwork—3 hours; term paper. Prerequisite: course 101A, 101B, 101C, and one of courses 115 and 118 or consent of instructor; course 110, Soil Science 100, Atmospheric Science 133 and Agricultural and Resource Economics 140 recommended. Application of plant, meteorological, soil, water, GIS, and economic sciences to sustainable vineyard development. Preparatory reading of a comprehensive study to determine the logistical and economic feasibility of a given site for raisin, table, or vine grape production. —I. (I.) Smart

change in existing course—eff. fall 12

Wildlife, Fish, and Conservation Biology

New and changed courses in Wildlife, Fish, and Conservation Biology (WFC)

Upper Division
100. Field Methods in Wildlife, Fish, and Conservation Biology (4)
Lecture—2 hours; laboratory—3 hours; fieldwork—3 hours. Prerequisite: Evolution and Ecology 101 or Environmental Science 101 or Policy 100. Consent of instructor. Introduction to field methods for monitoring and studying wild vertebrates and their habitats, with an emphasis on ecology and conservation. Required weekend field trips. GE credit: SciEng | Wrt | SE, VL, WE. —I. (I.) Eadie, Kett, Todd, Van Vuren

change in existing course—eff. winter 13

101. Field Research in Wildlife Ecology (2)
Lecture/discussion—2 hours. Prerequisite: Consent of instructor and one upper division course in each of ecology, statistics, and ornithology, mammalogy, or herpetology. Field research in ecology of wild vertebrates in terrestrial environments; formulation of testable hypotheses, study design, introduction to research methodology, oral and written presentation of results. Limited enrollment. Offered in alternate years. GE credit: SciEng | Wrt | SE, VL, WE. —I. (I.) Eadie, Kett, Todd, Van Vuren

change in existing course—eff. winter 13

111. Biology and Conservation of Wild Birds (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, or Biological Sciences 2A, 2B, 2C; Evolution and Ecology 101 or Environmental Science and Policy 100 or equivalent course. Phylogeny, distribution, migration, reproduction, population dynamics, behavior and physiological ecology of wild birds. Emphasis on adaptations to environments, species interactions, management, and conservation. GE credit: SciEng | SE. —I. (I.) Eadie

change in existing course—eff. winter 13

134. Herpetology (3)
Lecture—2 hours; term paper. Prerequisite: Biological Sciences 2A, 2B, 2C; Evolution and Ecology 101 or Environmental Science and Policy 100 or equivalent upper division course recommended; course 134 concurrently; consent of instructor. Diagnostic characteristics and functional attributes of amphibians and reptiles, emphasizing ecological, biogeographic and phylogenetic patterns. Field experience with common species of reptiles and amphibians in the Davis area. Offered in alternate years. —II. (II.) Todd

change in existing course—eff. fall 13

134L. Herpetology Laboratory (3)
Laboratory—6 hours. Prerequisite: Biological Sciences 2A, 2B, 2C; Evolution and Ecology 101 or Environmental Science and Policy 100 or equivalent upper division course recommended; course 134 concurrently; consent of instructor. Diagnostic characteristics and functional attributes of amphibians and reptiles, emphasizing ecological, biogeographic and phylogenetic patterns. Field experience with common species of reptiles and amphibians in the Davis area. Offered in alternate years. —II. (II.) Todd

change in existing course—eff. fall 13

141. Behavioral Ecology (4)
Lecture—3 hours; film viewing—1 hour. Prerequisite: Evolution and Ecology 101 or Environmental Science and Policy 100 or equivalent course. Basic theories underlying the functional and evolutionary significance of behavior, and the role of ecological...
constraints. Supporting empirical evidence taken mainly from studies of wild vertebrates. Offered in alternate years. GE credit: SciEng | SE, WE.—II. (I.) Cano (change in existing course—eff. winter 13)

154. Conservation Biology (4)
Lecture—3 hours; term paper [will be one or more book reviews]. Prerequisite: Evolution and Ecology 101 or Environmental Science and Policy 100 or the equivalent. An introduction to conservation biology and background to the biological issues and controversies surrounding loss of species and habitats. GE credit: SciEng | SE, WE.—I. (I.) Todd (change in existing course—eff. winter 13)

157. Coastal Ecosystems (4)
Lecture—3 hours; laboratory/fieldwork—3 hours. Prerequisite: Environmental Studies 100 and Evolution and Ecology 101; core work in organismal biology, physical geography, and geology recommended. Overview of coastal ecosystems, physical and biological elements and processes, and coastal zone dynamics, including sandy, rocky and muddy shorelines, estuaries, dunes and coastal watersheds. Discussion of the role of historical factors and conservation, restoration, and management approaches. Offered in alternate years. GE credit: SciEng | SE, VL.—(III.) Elliot/Fisk (change in existing course—eff. winter 13)

195. Field and Laboratory Research (3)
Laboratory—6 hours; discussion—1 hour. Prerequisite: course 110L, 111L, or 120L; 121 or 130; Evolution and Ecology 101 or the equivalent; and consent of instructor. Critique and practice of research methods applied to field and laboratory environments of wild vertebrates. Students work independently or in small groups to design experimental protocols, analyze data, and report their findings. May be repeated two times for credit. GE credit: SciEng | SE.—I, II, III. (I, II, III) Craig (change in existing course—eff. winter 13)

Women's Studies

New and changed courses in Women's Studies (WMS)

Lower Division

20. Cultural Representations of Gender (4)
Lecture/discussion—4 hours. Prerequisite: one course specified for the Women's Studies major. Interdisciplinary investigation of how specific cultural forms and phenomena including film, television, music, popular movements, and institutions affect the representations of women's experience. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WE.—III, IV. (II, III) Craig (change in existing course—eff. winter 13)

50. Introduction to Critical Gender Studies (4)
Lecture—3 hours; discussion—1 hour. Introduction to interdisciplinary, critical gender studies. Addresses the emergence of women's gender and feminist studies internationally, its links to women's movements, and its influence within the various arts, humanities and social science disciplines. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WE.—I, II, III, IV. (I, II, III) Craig (change in existing course—eff. winter 13)

60. Feminist Critiques of Western Thought (4)
Lecture/discussion—4 hours. Prerequisite: consent of instructor. Critical introduction to major traditions of social thinking in the West from a feminist perspective. Offered irregularly. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—Craig, Kuhn (change in existing course—eff. winter 14)

Upper Division

102. Gender and Post Colonialism (4)
Lecture/discussion—4 hours; term paper. Prerequisite: course 50, 60. Exploration of transformations of raced/gendered identities. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, DD, WC, WE.—I. (I.) Mena (change in existing course—eff. winter 14)

103. Introduction to Feminist Theory (4)
Lecture/discussion—4 hours. Prerequisite: one course specified for the Women's Studies major. Introduction to the emergence of feminist theory and to key concepts in feminist theorizing. Examination of past and current debates over sexuality, race, identity politics, and the social construction of women's experiences. GE credit: ArtHum or SocSci | ACGH, AH or SS, DD, WE.—I. (I.) Constable, Craig, Kuhn, Mena, Nettles-Barcelón (change in existing course—eff. winter 13)

104. Feminist Approaches to Inquiry (4)
Lecture/discussion—4 hours. Prerequisite: one course specified for the Women's Studies major. Feminist applications and transformations of disciplinary practices; current issues and methodologies in feminist interdisciplinary work. GE credit: ArtHum or SocSci | ACGH, AH or SS, DD, WE.—II. (II.) Constable, Craig, Mena, Nettles-Barcelón (change in existing course—eff. winter 13)

138. Critical Fashion Studies (4)
Lecture/discussion—4 hours. Prerequisite: one course in Women's Studies, or Textiles and Clothing 7. Feminist cultural studies of style-fashion-dress through transnational circuits, personal subjectivities. Fashion as means of gender oppression and liberation. Histories and discourses of masculinities and femininities. Clothing works on global assembly line. Use of dress in construction / regulation of identities. Offered irregularly. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, DD, VL, WE.—Kaiser (change in existing course—eff. winter 14)

139. Feminist Cultural Studies (4)
Lecture/discussion—4 hours. Prerequisite: one course in Women's Studies or American Studies. The histories, theories, and practices of feminist traditions within Cultural Studies. (Same as course American Studies 139) GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WE.—(II.) Kaiser (change in existing course—eff. winter 13)

145. Women's Movements in Transnational Perspective (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 50, 60, consent of instructor. Class size limited to 90 students. Transnational perspectives on twentieth and twenty-first century women's movements in Western, colonial and post-colonial contexts, examining movement's forms and political orientations and relationships between women's movements and other forces for change. Offered in alternate years. GE credit: ArtHum or SocSci, Div | AH or SS, OL, WC, WE.—III, IV. (IV, III) Craig, Mama (new course—eff. fall 13)

146. Gender, War and Peace (4)
Lecture/discussion—4 hours. Prerequisite: course 20, 50, or consent of instructor. Applies a critical gender perspective to militarism as manifest in contexts of military rule, war, conflict, peacebuilding and security policies. Changes the classing configurations of gender and sexuality in military institutions and militarized economies and cultures from an interdisciplinary perspective. Offered irregularly. GE credit: ArtHum or SocSci | ACGH, AH or SS, DD, WC, WE.—III. (III.) Mama (new course—eff. fall 13)

148. Science, Gender, and Social Justice (4)
Lecture/discussion—4 hours; term paper. Prerequisite: course 50 or consent of instructor. Class size limited to 60 students. Critical reading and reflection on the history of Western scientific institutions and the changing role of science in relation to inequalities of class, race, gender and sexuality, and global struggles for equality and justice. Offered irregularly. GE credit: ArtHum or SocSci, Div | AH or SS, DD, WC, WE.—III. (III.) Craig, Kaiser, Mama (new course—eff. fall 13)

160. Women, 'Race' and Sexuality in Postcolonial Cinema (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 20 or 50. Class size limited to 90 students. Feminist analysis of race and gender in the representation of women in commercial and/or independent films. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—(III.) Craig, Kaiser, Mama (new course—eff. winter 14)

165. Feminist Media Production (6)
Lecture/discussion—3 hours; term paper; laboratory/fieldwork—6 hours. Prerequisite: one course in Women and Gender Studies or consent of instructor. Basic media production and community service. Video, audio and photography instruction; feminist community documentary; video ethnography; video journals; alternative representations of fashion and women's bodies. Fundamentals of camera and microphone operation, interviews, and editing. May be repeated two times for credit when topic differs. Offered irregularly. GE credit: ArtHum or SocSci, Div | ACGH, AH or SS, DD, VL.—(III.) Constable (change in existing course—eff. fall 12)

175. Gender and Experience of Race (4)
Lecture/discussion—4 hours. Prerequisite: course 50, 60, or consent of instructor. Exploration of the co-construction of "race" and gender in comparative national historical contexts and contemporary lived experience. Study of intersections of race and gender in identity formation, color hierarchies, labor migration, social movements and consumption. Use of lens and body mapping. GE credit: ArtHum or SocSci, Div | ACGH, AH or SS, DD, WE.—I. (I.) Ho, Nettles (new course—eff. fall 13)

178A-G. Women Writers and the Transnational Imaginary (4)
Lecture/discussion—4 hours. Prerequisite: one course in Women's Studies, or consent of instructor. Offered irregularly. GE credit: ArtHum, Div, Wrt | ACGH, AH or SS, DD, VL, WE.—III. (III.) Ho, Joseph, Kuhn, Mena, Mama, Nettles-Barcelón (change in existing course—eff. winter 14)

182. Globalization, Gender and Culture (4)
Lecture/discussion—4 hours. Prerequisite: course 50; consent of instructor. Critical gender analysis of globalization as a process of interconnected cultural, social and economic transformations inflicted by gender, nation, class and race. The sociopolitical self reflection and social observation skills. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, OL, WC, WE.—III. Mama (change in existing course—eff. winter 14)
185. Women and Islamic Discourses (4)
Lecture/discussion—4 hours. Prerequisite: course 50 or comparable course. Introduction to the debates/discourses about women and Islam. Transformations in debates/discourses in colonial and postcolonial periods in the Middle East & South Asia. Comparative study of debates/discourses on family, work, law, sexuality, religion, comportment, human rights, feminist and religious movements. Not offered every year. (Same course as Middle East/South Asia Studies 130.) GE credit: ArtHum or SocSci | AH or SS, WC.—Joseph
(change in existing course—eff. winter 13)

189. Special Topics in Critical Gender Studies (4)
Lecture/discussion—4 hours. Prerequisite: one course specified for the Women’s Studies major. In-depth examination of a women’s studies topic related to the research interests of the instructor. May be repeated one time for credit when topic differs. Offered irregularly. GE credit: ArtHum or SocSci | AH or SS, WE.—I.
(change in existing course—eff. spring 13)

190. Senior Seminar (4)
Seminar—4 hours. Prerequisite: senior standing in Women’s Studies. Capstone course for senior Women’s Studies majors, which focuses on current issues on feminism as they impact theory, public policy, and practice. GE credit: ArtHum or SocSci | ACGH, AH or SS, DD.—III. (III.) Constable, Craig, Ho, Joseph, Kaiser, Kuhn, Mama, Mena, Nettles-Barcelón, Swain
(change in existing course—eff. winter 13)

191. Capstone Seminar (4)
Seminar—4 hours. Prerequisite: course 104 or Textiles and clothing 107, and course 194HA, course 199, or Textiles and Clothing 199, or consent of instructor. Revision, completion, and presentation of senior research or creative project. Creating a multimedia Web site for publishing research and creative projects. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, DD, WE.—III. (III.) Kaiser
(change in existing course—eff. winter 13)

193. Feminist Leadership Seminar (2)
Seminar—2 hours. Prerequisite: course 50, 192. Use feminist methods to critically reflect on the ethical, methodological and strategic aspects of an organization, project, campaign, movement or other social change initiative. May be repeated for credit. Offered irregularly. (P/NP grading only.) GE credit: ArtHum or SocSci | ACGH, AH or SS, DD, WE.—III. (III.) Kaiser
(change in existing course—eff. winter 13)

194HA-194HB. Senior Honors Project in Women’s Studies (4-6)
Independent study—12 hours. Prerequisite: senior standing, Women’s Studies major, and adviser’s approval. In consultation with an adviser, students complete a substantial research paper or significant creative project on a Women’s Studies topic. (Deferred grading only, pending completion of sequence.) GE credit: ArtHum or SocSci | AH or SS, WE.—Constable, Craig, Ho, Joseph, Kaiser, Kaplan, Kuhn, Mama, Mena, Nettles-Barcelón, Swain
(change in existing course—eff. winter 13)

195. Thematic Seminar in Critical Gender and Women’s Studies (4)
Seminar—4 hours. Prerequisite: course 50, 60. Limited enrollment. Group study of a topic, issue or area in feminist theory and research involving intensive reading and writing. May be repeated for credit. Offered irregularly. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.
(change in existing course—eff. winter 14)
Policies & Requirements Addendum

Appendix

Changes to the Appendix

**UNIVERSITY POLICY ON NONDISCRIMINATION, SEXUAL HARASSMENT/SEXUAL ASSAULT, DISABILITY ACCOMMODATIONS, STUDENT RECORDS AND PRIVACY**

**Nondiscrimination.** The University of California, in accordance with applicable Federal and State law and University policy, does not discriminate on the basis of race, color, national origin, religion, sex, gender identity, pregnancy (including pregnancy, childbirth, and medical conditions related to pregnancy or childbirth), physical or mental disability, age, medical condition (cancer-related or genetic characteristics), ancestry, marital status, citizenship, sexual orientation, or service in the uniformed services (includes membership in, application for membership, performance of service, application for service, or obligation for service in the uniformed services) status as a Vietnam-era veteran or special disabled veteran. The University also prohibits sexual harassment, including sexual assault. This nondiscrimination policy covers admission, access, and treatment in University programs and activities.

**Discrimination, Harassment, or Arbitrary Treatment.** If students have questions about student-related nondiscrimination policies or concerns about possible discrimination, harassment, or arbitrary treatment, they may contact Student Judicial Affairs for information and assistance 530-752-1128. Additional resources for students include the UC Davis Compliance Officer (ADA and Title IX Officer) 530-752-9466 or the dean’s office for their college. Graduate students may also contact the Office of Graduate Studies 530-752-0650 or the Graduate Students Association 530-752-6108. Students are encouraged to seek assistance as soon as possible, as time limits may apply to grievance processes. Campus policies provide for a prompt and effective response to student complaints. This response may include early resolution procedures or, as appropriate, an administrative review or investigation. The student will be informed of the results of the review.

**Sexual Harassment/Sexual Assault.** Sexual harassment and sexual assault are prohibited by law and by university policy and will not be condoned. Campus policy (PPM Section 380-12 at http://manuals.ucdavis.edu/ppm/380/380-12.pdf) describes campus procedures for responding to reports of sexual harassment and sexual assault. Under this policy, sexual assault is considered an extreme form of sexual harassment. UC Davis’s response to reports of sexual harassment and sexual assault may include interim actions, early resolution processes, and formal investigation procedures. If a complaint of sexual harassment or sexual assault is substantiated, the campus will take appropriate remedial action, including discipline. The Harassment and Discrimination Assistance and Prevention Program 530-752-9253 works with students to resolve complaints of sexual harassment, including sexual assault, and provides referrals to other campus resources. Students may report sexual harassment to deans, supervisors, managers, the Campus Sexual Harassment Officer and other campus officials, including Student Judicial Affairs, Student Housing, and the Chief Compliance Officer (Title IX Officer). With the exception of certain confidential resources, University officials receiving a report of sexual harassment or sexual assault must immediately consult with the Sexual Harassment Officer. Students may seek confidential advice and support from Counseling and Psychological Services 530-752-0871, the Campus Violence Prevention Program (530) 752-3299, the Lesbian, Gay, Bi-Sexual, and Transgender Resource Center 530-752-24452, and the Women’s Resources and Research Center 530-752-3372. Consultation with these resources will not lead to an official report unless additional action is taken by the individual seeking advice.

**Art Studio**

**Changes to the Art Studio Major Program Requirements**

A.B. Major Requirements: 44

**Preparatory Subject Matter...........................................24**

Four courses chosen from Art Studio 2, 5, 7, 8, 9, 11, 12.......................... 16

Any two upper division theory or history courses from Art History, Cinema and Technological Studies, Design, Music or Theatre and Dance .......................... 8

**Depth Subject Matter.................................................44**

36 upper division units in Art Studio........... 36

Any two upper division courses or history courses from Art History, Cinema and Technological Studies, Design, Music or Theatre and Dance .......................... 8

**Total Units for the Major.................................68**

Major Advisers. Information on the current Academic Advisors can be obtained by contacting the Art Department Main Office at 530-752-0103.

**Asian American Studies**

**Changes to the Asian American Studies Major Program Requirements—Humanities Emphasis**

A.B. Major Requirements: 58

**Humanities Emphasis**

**Preparatory Subject Matter.................................31**

Asian American Studies 1, 2.................. 8

One Asian language: Chinese 1, 2, 3; Japanese 1, 2, 3, or equivalent Asian language .......................... 15

Note: For courses in Asian languages, see Chinese and Japanese (under East Asian Languages and Cultures). For other Asian courses, see East Asian Languages and Culture and East Asian Studies.

At least two lower division courses from the following departments or programs: African American and African Studies, Chicano/o Studies, Native American Studies, Women and Gender Studies (all lower division courses of at least 4 units are acceptable except those numbered 92, 97T, 98, and 99).......................... 8

**Depth Subject Matter.................................44-47**

At least seven upper division Asian American Studies courses (excluding 197T, 198, 199 and not more than 6 units of internships)................. 28-30

Select four courses from one of the following tracks ................................ 16-17

**Literature/Culture Track**

Comparative Literature 153; Dramatic Art 154, 155; English 178, 179, 185A, 185B
Biological Sciences

Changes to the Biological Sciences Major Program Requirements

A.B. Major Requirements:

Preparatory Subject Matter.................................. 39-52
Biological Sciences 2A-2B-2C.......................... 14
Chemistry 2A-2B ........................................... 10
Chemistry 8A-8B or 118A-118B-119C ................. 6-12
Physics 1A-1B or 7A-7C-7E ......................... 6-12
Statistics 13, 32, 100, or 102 ...................... 3-4
Recommended: Chemistry 2C and Mathematics 17A-17B or 21A-21B.

*Mathematics 16A-16B accepted to fulfill this recommendation only for transfer students admitted prior to fall 2013.

Total units for the major .................................. 77-94

Changes to the Biological Sciences B.S. Major Requirements—Field Course Lists

Field Requirement: Breadth in biology is achieved by completing one course from each field (a) through (e) below. You must take one course in each field regardless of your area of emphasis. If you plan an area of emphasis in Evolution, Ecology and Biodiversity; Marine Biology; or Microbiology, please refer to that area of emphasis before choosing field requirement classes as specific, designated field courses are required. The required courses are listed under that area of emphasis. Although a course may be listed in more than one category (including the area of emphasis requirements), that course may be used only once and may satisfy only one requirement.

Field Course Lists

(a) Evolution: Anthropology 151, 152, 154A; Evolution and Ecology 100; Geology 107; Plant Biology 143 .............................. 3-5
(b) Ecology: Anthropology 154B; Biological Sciences 122; Entomology 104, 156; Environmental Science and Policy 100, 121; Evolution and Ecology 101; Microbiology 120; Wildlife, Fish, and Conservation Biology 151 ................................. 3-5
(c) Microbiology: Food Science and Technology 104, Microbiology 101, 104, 140, 150, 162; Pathology, Microbiology, and Immunology 127, 128; Soil Science 111 ...................................................... 3-5
(d) Neurobiology: Physiology, and Behavior: Anthropology 154A, Entomology 102, 104; Neurobiology, Physiology, and Behavior 100, 101, 102, 141......................... 3-5

Changes to the Biological Sciences B.S. Major Requirements—Field Requirement

B.S. Major Requirements: ................................. 12
Evolution, Ecology and Biodiversity emphasis—Field requirement

Students choose to complete Biological Sciences 105 or 102+103 for this emphasis.

Field requirement: Students must take Evolution and Ecology 100 to satisfy Field requirement (a), and Evolution and Ecology 101 to satisfy Field requirement (b).

(1) At least 12 units including at least one course from each of the following two groups ................. 12
(a) Biodiversity: Entomology 103; Evolution and Ecology 105, 106, 108, 112L, 114, 134, 134L, 134F, 140; Microbiology 105, 105L; Entomology 110; Plant Biology 116, 147, 148; Wildlife, Fish, and Conservation Biology 110, 110L, 111, 111L, 120, 120L.

(2) Laboratory/Fieldwork Requirement. Included in the above 12 units, complete a total of 2 units or a total of 6 hours/week of fieldwork or laboratory work. Courses that may be used to satisfy this requirement are: One course from: Evolution and Ecology 106, 108, 112L, 114, 134L, Microbiology 105L, Plant Biology 116, 148; Wildlife, Fish, and Conservation Biology 110L; 111L OR two courses from Evolution and Ecology 117, 119, 134F, 140, 180A, 180B; Plant Biology 147; Wildlife, Fish, and Conservation Biology 120L.

Changes to the Biological Sciences—Plant Biology emphasis

Plant Biology emphasis .................................... 14-17

Students choose to complete Biological Sciences 105 or 102+103 for this emphasis.

Select one course from each of the following four areas. A course may be listed in more than one area or field, but may be used to satisfy only one requirement.

(1) Anatomy and morphology: Evolution and Ecology 140; Plant Biology 105, 116 ................................. 4-5
(2) Physiology, development and molecular biology: Plant Biology 111, 112, 113; Plant Pathology 130 ................................. 3-5
(3) Evolution and ecology: Evolution and Ecology 102, 107; Entomology 117, 143 .................................................. 3-4

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2013-2014 offering in parentheses

Pre-Fall 2011 General Education (GE): Arts and Humanities; Social Science and Engineering; Social Sciences; American Cultures; Domestic Diversity; Writing Experience

Fall 2011 and on General Education (GE): Arts and Humanities; Social Science and Engineering; Social Sciences; American Cultures; Domestic Diversity; Writing Experience

Unit Credit Limitations

- Passed/Not Passed Units. All courses used to satisfy major requirements must be taken on a letter-graded basis, unless courses are only offered on a Passed/Not Passed basis.

- Physical Education. Maximum of 6 units of Physical Education 1, 6 and similar physical activity courses including transfer work.

- Transfer work. Maximum of 105 units of credit earned at two-year institutions (community college).

- Graduate Courses. Units from courses in the 200 series (with the exception of course 299) may apply toward the minimum 64-unit upper division requirement and/or as a substitution for undergraduate courses in the major under the following conditions.
- Students must obtain written permission from the course instructor and the master adviser for their major.
- The master adviser will confirm that students have a minimum 3.400 GPA in the major at the time that they register for the course.

- Professional and teaching courses. Maximum of 9 units in courses numbered 300-399 and 400-499. These units may not be applied toward the 64-unit upper division requirement.

- Upper division standing. Must complete 84 units before enrolling in 192, 194H and 199 to receive degree and upper division credit.

- Special Study. Not more than 5 units per quarter of Special Study courses (99, 194H, 199).

- Nonstandard Courses. Maximum of 20 units of nonstandard courses including transfer work.
Nonstandard courses are defined here as tutoring, internship, research, research conference, honors research and similar course activities. Some examples of these courses are, but are not limited to, courses numbered 90C, 92, 92C, 97T, 97TC, 99, 189, 190C, 191, 192, 192C, 193, 194H, 197T, 197TC, 199, etc. Courses numbered 98 or 198 are not included in this 20-unit limitation.

There are additional unit credit limitations on tutoring and internship units.

- **Tutoring.** Maximum of 3 tutoring units including but not limited to 97T, 197T, 97TC and 197TC.
- **Internship.** A maximum of 6 internship units including but not limited to 92, 92C, 92C.

Specific exceptions to these limits may be granted by the Committee on Undergraduate Petitions based on the uniqueness of the experiences and their concordance with the petitioner's educational objectives.

**Credit for Open Campus (Concurrent) Courses.** Students may apply credit for courses taken in the Open Campus (Concurrent) Program through UC Davis Extension towards the 180-unit undergraduate degree requirement. The grade points earned when enrolled in Open Campus courses will count toward the calculation of a student's UC GPA upon his/her admission or readmission to regular student status at UC Davis. However, the units earned do not satisfy the university residence requirement. Students registered at UC Davis may not enroll in Open Campus courses.

**Changes to the Biological Sciences College Requirements for the Bachelor's Degree; English Composition Requirement**

**English Composition Requirement**

The English Composition requirement may be satisfied in one of two ways:

1. Completing 8 units, to include 4 upper division units, in English composition courses with at least a C- or Passed grade from the following list: Comparative Literature 1, 2, 3, 4, English 3, Native American Studies 5, University Writing Program 1, 18, 19, 101, 102 series, or 104 series. OR

2. Passing the English Composition Examination, administered by the Entry Level Writing program, upon completion of 70 units of degree credit. This examination does not yield credit. Students interested in entering the health sciences field should check with the Health Sciences Advising Office or the Dean's Office before choosing this option.

**Changes to the Biological Sciences College Requirements for the Bachelor's Degree; Additional Bachelor of Arts Requirements**

**Additional Bachelor of Arts Requirements**

Bachelor of Arts degrees are available in Biological Sciences; Evolution, Ecology and Biodiversity; Exercise Biology; Microbiology; and Plant Biology. These degrees offer students an opportunity to broaden their education while pursuing a rigorous life science major.

Candidates for the Bachelor of Arts degrees must complete two additional requirements.

1. **Foreign Language.** The requirement can be met in one of three ways:

   - Complete with passing grades 15 quarter units of college level course work, or the equivalent thereof, in a single language.

   - Attain a minimal score prescribed by the Committee on Undergraduate Curriculum and Educational Policy, in the College Entrance Examination Board Achievement Test in Foreign Language, which may be taken at any time during the student's high school career, or any other achievement test approved by the Committee on Undergraduate Curriculum and Educational Policy.

   - Placement beyond the 15-unit level on a placement/proficiency examination offered by one of the foreign language departments of the University.

2. **Breadth Requirements.** Satisfaction of the campus General Education requirement (or IGETC for transfer students) in effect Fall 2011 will satisfy the Breadth requirement. Students that matriculated prior to Fall 2011 have the option of completing the Breadth Requirement specified in the College of Biological Sciences regulations prior to this revision. Completion of a minor in the humanities, social sciences or fine arts can offer structure and coherence to the courses selected for satisfaction of the requirement.

**Chemistry**

**Changes to the Applied Chemistry Major Program Requirements—Forensic Chemistry emphasis**

**B.S. Major Requirements:**

**Preparatory Subject Matter ..................**

<table>
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<th>UNITS</th>
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<tbody>
<tr>
<td>Chemistry 2A-2B or 2AH-2BH ............</td>
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<tr>
<td>Physics 7A-7B-7C or 9A-9B-9C ..........</td>
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<tr>
<td>Mathematics 1A-1B-1C or 17A-17B-17C or 2A-2B-2C-2D-2E ..........</td>
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<tr>
<td>Biological Sciences 2A ...............</td>
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<tr>
<td>Environmental Toxicology 20 ..........</td>
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<td>Statistics 13, 32, 100 or 102 ..........</td>
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**Depth Subject Matter .....................**

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<th>UNITS</th>
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<tbody>
<tr>
<td>Chemistry 104, 105, 112 ................</td>
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<tr>
<td>Chemistry 107A-107B or 110A-110B-110C .........</td>
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<tr>
<td>Environmental Toxicology 101, 102A, 102B .........................</td>
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<tr>
<td>At least two courses from Biological Sciences 101; Environmental Science and Policy 161; Environmental Toxicology 103A, 103B, 111, 113, 138, Statistics 108, 130A ..........</td>
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<tr>
<td>At least 3 additional upper division units in chemistry [Chemistry 199 or 194H strongly encouraged] .........................</td>
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**Total Units for the Major ..................**

**Changes to the Pharmaceutical Chemistry emphasis**

**B.S. Major Requirements:**

**Preparatory Subject Matter ..................**

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<tr>
<td>Chemistry 2A-2B or 2AH-2BH ............</td>
</tr>
<tr>
<td>Physics 7A, 7B, 7C or 9A-9B-9C ..........</td>
</tr>
<tr>
<td>Mathematics 1A-1B-1C or 17A-17B-17C or 2A-2B-2C-2D-2E ..........</td>
</tr>
<tr>
<td>Biological Sciences 2A, and 2B or 2C .......</td>
</tr>
<tr>
<td>Statistics 13, 32 or 100 ................</td>
</tr>
</tbody>
</table>

**Depth Subject Matter .....................**

<table>
<thead>
<tr>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 124A, 130A-130B-135, 150 ......</td>
</tr>
<tr>
<td>Chemistry 107A-107B or 110A-110B-110C .........</td>
</tr>
<tr>
<td>Biological Sciences 102 or Chemistry 131 .........................</td>
</tr>
<tr>
<td>At least four courses [not used to satisfy the above requirements] from Biological Sciences 102, 103, Biotechnology 171 or Veterinary Medicine 170, Chemistry 131, 199 [minimum 3 units] or 194H, Environmental Toxicology 103A, Microbiology 104, Neurobiology, Physiology, and Behavior 100, 101, Plant Biology 126 ..........</td>
</tr>
</tbody>
</table>

**Total Units for the Major ..................**

---

Quarter Offered: I-Spring, IV-Summer; 2012-2014 offering in parentheses

Pre-Fall 2011 General Education (GE): AA—American Cultures; DD—Domestic Diversity; OD—Oral Skills; VL—Visual; WE—Writing Experience

Fall 2011 and on General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
Coaching Principles and Methods

(Black of Letters and Science)
The Coaching Principles and Methods minor is an interdisciplinary minor open to undergraduates in all four colleges. Students must complete a statement of interest to assist in placing them in future internships. This form is available in the Physical Education Program Office (264 Hickey Gym) and may be turned in at any time.

Minor Program Requirements:

Coaching Principles and Methods........................................... 20

Physical Education 1 (must complete a minimum of two Physical Education 1 courses in two different activities or sports)................. 1
Physical Education 7................................................................ 1
Physical Education 100 ............................................................ 2
Physical Education 143 ............................................................ 3
Physical Education 141 ............................................................ 3

Required Minor Electives

A minimum of 8 units with courses from at least two different departments. One course must be taken from race/class/gender list. Second course can be from race/class/gender list or from sociocultural issues and settings list.

Race/Class/Gender List:


Sociocultural Issues and Settings List:

American Studies 115, 130, 152, Anthropology 141B, Education 115, 122, 153, Exercise Biology 102, 121, 122, Human Development 100B, 110, Native American Studies 156, Physical Education 120, Psychology 126, 140, 151, 157, 158, 161, 162, 168, Sociology 122, 123, 124, 131, 153, Women’s Studies 140

PHE 192 has a prerequisite of junior/senior standing. PHE 192 cannot be taken until after a student has completed more than 90 total units. PHE 192 internship must be in a coaching or teaching setting. Setting must be approved in ADVANCE by the coaching minor adviser before a CRN will be issued.

Minor Adviser: Lou Bronzan, 530-752-5541 or lbronzan@ucdavis.edu

Advising Center, 289 Hickey Gym

Earth and Planetary Sciences

Changes to the Communication Major Program Requirements

The Major Program

The major in communication focuses upon human symbolic behavior in interpersonal and mediated contexts.

The Program. The program of study in communication examines communication processes at several different levels of analysis. Courses dealing with communication at the individual, interpersonal, organizational, and social levels of analysis are offered.

The emphasis in the program reflects the changing focus in the discipline and society toward computer-mediated communication, quantitative behavioral science and cognitively science. Classes addressing such topics as communication and cognition, message systems, interpersonal communication, nonverbal communication, communication and persuasion, organizational communication, mass media effects, computer-mediated communication and public communication campaigns explore communication at these levels of analysis. Related social science courses are also part of the major.

Preparatory Requirements. Before declaring a major in communication, students must complete the following courses with a combined grade point average of at least 2.500 at the University of California (at least 3.000 GPA may be required for similar courses taken at community college). All courses must be taken for a letter grade:

Anthropology 4 or Linguistics 1.............. 4 units
Computer Science 15 or Philosophy 12.............. 4 units
Psychology 1.................................. 4 units
Sociology 1.................................. 5 units
Statistics 13.................................. 4 units

Career Alternatives. Communication graduates have found careers in such fields as broadcast and print journalism, administration, sales, management, politics and government, education, social work, and public relations. A communication degree is also excellent preparation for law school or other graduate programs.

A.B. Major Requirements:

Preparatory Subject Matter................................. 25
Anthropology 4 or Linguistics 1......................... 4
Communication 1 or 3 or 5 or Linguistics 5........... 4
Computer Science 15 or Philosophy 12.............. 4
Psychology 1.................................. 4
Sociology 1.................................. 5
Statistics 13.................................. 4

Depth Subject Matter.............................. 40
Communication 101.................................. 4
Communication 102, 105, 134, 140.................. 16
Select five of the following additional courses


Note: Many of the upper division courses offered by the other L&S departments have their own prerequisites not accounted for by lower division Communication courses. To the degree that students elect to take those courses having “hidden prerequisites,” the number of units necessary to complete the major increases above the stated minimum.

Total Units for the Major............................... 65

Earth and Planetary Sciences

Change to department name

Formerly Geology

(Black of Letters and Science)

Quarter Offered: I- Fall, II- Winter, III- Spring, IV- Summer; 2013-2014 offering in parentheses

Pre-Fall 2011 General Education (GE): Arts & Humanities; ScEng-Science and Engineering; Sci-St-Social Sciences; SCI-Scientific; VL=Visual; WC=World Cultures; WE=Writing Experience

Fall 2011 and on General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; ACH=American Cultures; D&D=Domestic Diversity; WE=Writing Experience

Changes to the East Asian Languages and Cultures Major Program Requirements

Chinese

A.B. Major Requirements:

Preparatory Subject Matter................................. 0-30
Chinese 1, 2, 3, 4, 5, 6, or 18L, 28L, 38L, or 1CN, 2CN, 3CN.

Recommended:

Chinese 10, 11, 50, Comparative Literature 14, Japanese 10, Linguistics 1, History 9A.

Depth Subject Matter.............................. 40
Chinese 106, 107, 111, 112, 113, 114, 160

Note: With prior approval of an undergraduate adviser, students already proficient in Chinese at the third-year level (courses 111-12-113) should take three other upper division Chinese courses instead. Three courses selected from Chinese 100A, 101, 102, 103, 104, 105, 108, 109A, 110, 115, 116, 120, 130, 131, 132, 140, 150; one of the three courses must be from 101, 102, 103, 104, 109G

Recommended:

Chinese 101, 102, 103, 104, 105, 106; Anthropology 148A-148B, Art History 163A-163B; East Asian Studies 113; History 191A-F; Religious Studies 172; or other advanced literature and culture courses selected in consultation with the undergraduate adviser.

Total Units for the Chinese Major............................... 52-70

Japanese

A.B. Major Requirements:

Preparatory Subject Matter................................. 0-30
Japanese 1, 2, 3, 4, 5, 6

Recommended:

Japanese 10, 15, 25, Chinese 10, 11, 50, Linguistics 1, History 9B.

Depth Subject Matter.............................. 40
Japanese 101, 102, 103, 111, 112, 113

Note: With prior approval of an undergraduate adviser, students already proficient in Japanese at the third-year level (courses 111-12) should take three other upper division Japanese courses instead. Three courses selected from Japanese 104, 105, 106, 107, 108, 109A, 115, 131, 132, 133, 134, 135, 136, 141

Recommended:

Japanese 101, 102, 103, 104, 105, 106; Anthropology 148A-148B; Art History 163A-163B; East Asian Studies 113; History 191A-F; Religious Studies 172; or other advanced literature and culture courses selected in consultation with the undergraduate adviser.

Total Units for the Japanese Major............................... 40-70

Major Advisers: C. Chang, D. Oudry, and J. Sorensen (Japanese); C. Chu, M. Halperin and M. Yeh (Chinese)
Engineering

Changes to Engineering Major Program Requirements

The Major Programs
Thirteen majors, leading to the B.S. degree, are open to students.

- Aerospace Science & Engineering
- Biochemical Engineering
- Biological Systems Engineering
- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Computer Science and Engineering
- Electrical Engineering
- Electronic Materials Engineering (not accepting new students)
- Materials Science and Engineering
- Mechanical Engineering
- Optical Science and Engineering (not accepting new students)
- Chemical Engineering/Materials Science and Engineering (not accepting new students)
- Mechanical Engineering/Materials Science and Engineering (not accepting new students)

Engineering: Applied Science

Changes to Optical Science and Engineering Major Program Requirements

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course Description</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Science Engineering 1</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A-22B</td>
<td>6</td>
</tr>
<tr>
<td>Physics 9A-9B-9C-9D</td>
<td>19</td>
</tr>
<tr>
<td>Chemistry 2A</td>
<td>5</td>
</tr>
<tr>
<td>Civil Engineering 19 or Computer Science Engineering 30</td>
<td>4</td>
</tr>
<tr>
<td>Engineering 17</td>
<td>4</td>
</tr>
<tr>
<td>Engineering 45 or 45 Y</td>
<td>4</td>
</tr>
<tr>
<td>English 3 or University Writing Program 1, 1Y, or 1V or Comparative Literature 1, 2, 3, or 4, or Native American Studies 5</td>
<td>4</td>
</tr>
<tr>
<td>Communication 1 or 3</td>
<td>4</td>
</tr>
<tr>
<td>General Education electives</td>
<td>32</td>
</tr>
<tr>
<td>Total Lower Division Units</td>
<td>102</td>
</tr>
</tbody>
</table>

Upper Division Required Courses

<table>
<thead>
<tr>
<th>Course Description</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical and Computer Engineering 100A, 100B, 101A, 101B</td>
<td>36</td>
</tr>
<tr>
<td>Physics 104A</td>
<td>11</td>
</tr>
<tr>
<td>Physics 104C</td>
<td>3</td>
</tr>
<tr>
<td>Physics 110A</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry 100A</td>
<td>4</td>
</tr>
<tr>
<td>Engineering 190</td>
<td>3</td>
</tr>
<tr>
<td>Optics electives</td>
<td>16</td>
</tr>
</tbody>
</table>

Technical electives

Upper Division Composition Requirement:

- Course one from the following (grade of C- or better required): University Writing Program UWP 101, 102A, 102B, 102G, 102E, 104A, 104B, 104E, 104F, 104T, 105G
- Cell by passing the Upper Division Composition Exam

Minimum Lower Division Units: 86

Minimum Units Required for Major: 180

Engineering: Biological and Agricultural

Changes to Biological and Agricultural Engineering Undergraduate Major Program Requirements & Minor Requirements

Biological Systems Engineering Program

The Biological Systems Engineering program is accredited by the Engineering Accreditation Commission of ABET.

Biological systems engineering majors are encouraged to carefully adhere to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course Description</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A-22B</td>
<td>6</td>
</tr>
<tr>
<td>Physics 9A-9B-9C</td>
<td>15</td>
</tr>
<tr>
<td>Chemistry 2A-2B-2C</td>
<td>15</td>
</tr>
<tr>
<td>Engineering 6, 35, 17</td>
<td>12</td>
</tr>
<tr>
<td>Biological Systems Engineering 1</td>
<td>4</td>
</tr>
<tr>
<td>Biological Systems Engineering 2</td>
<td>4</td>
</tr>
<tr>
<td>University Writing Program 1, 1Y or 1V</td>
<td>4</td>
</tr>
<tr>
<td>Communication 1 or 3</td>
<td>4</td>
</tr>
<tr>
<td>Total Lower Division Units</td>
<td>90</td>
</tr>
</tbody>
</table>

Upper Division Required Courses

<table>
<thead>
<tr>
<th>Course Description</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Systems Engineering electives</td>
<td>12</td>
</tr>
<tr>
<td>Select a minimum of 4 units from all upper-division Biological Systems Engineering courses other than required, with the exception of Biological Systems Engineering courses 199-199</td>
<td>4</td>
</tr>
<tr>
<td>Statistics 100</td>
<td>4</td>
</tr>
<tr>
<td>Engineering electives—Select a minimum of 3 units. All upper division courses offered by the College of Engineering may be taken as engineering electives with the exception of the following: Civil and Environmental Engineering 123, Computer Science Engineering 188, Environmental Engineering 103, 160, all courses numbered 190-197 and 199 (except Engineering 190, which may be taken for 2 units of engineering elective credit)</td>
<td>3</td>
</tr>
<tr>
<td>Biological science electives—All upper-division courses in the College of Biological Sciences (with the exception of Biological Sciences 132, Evolution and Ecology 175, Exercise Biology 102, 112, 115, 118 through 149L, Microbiology 100 and all courses numbered 190-199) may be used as biological science electives. The following courses may also be taken as biological science electives: Applied Biological Systems Technology 161; Animal Science 118, 143, 144, 146; Agricultural Management and Rangeland Resources 110A; Atmospheric Sciences 123; Avian Sciences 161; Biology and Human Anatomy 101, 101L; Environmental Horticulture 102; Environmental Science Policy and Management 120, 122, 125 (offered at UC Berkeley); Environmental Science and Policy 100, 110, 155; Environmental Toxicology 101, 112A, 131; Food Science and Technology 102A, 102B, 102C, 120, 121, 128, 159; Infectious Diseases 141; Soil Science 100; Wildlife, Fish, and Conservation Biology 121. Students may choose other upper division courses with substantial biological content offered by the College of Agricultural and Environmental Sciences; consultation with a faculty adviser and approval by the curriculum committee is required.</td>
<td>4</td>
</tr>
<tr>
<td>Minimum Upper Division Units</td>
<td>72</td>
</tr>
</tbody>
</table>

- The Upper-Division composition exam administered by the College of Letters and Sciences cannot be used to satisfy the upper-division composition requirement for students in the Biological Systems Engineering program.

Minimum Units Required for Major: 185

Master Undergraduate Adviser: M. Delwiche

Energy Policy Minor

All courses must be taken for a letter grade. Grade of C- or better required for all courses used to satisfy minor requirements with overall GPA in minor requirement courses of 2.000 or better.

Minor Requirements:

- Applied Science 188 and Environmental Science and Policy 167 | 8 |
- Select 10 units from: Civil Engineering 125; Environmental Science and Policy 171, 163, 168A, 169B; Political Science 102, 109, 122, 164, 143, 162, 164 | 10 |

Total Units for the Minor: 18

Minor Advisors: Deb Niemeyer (Department of Civil and Environmental Engineering), Joan Ogden (Environmental Science and Policy)

Energy Efficiency Minor

All courses must be taken for a letter grade. Grade of C- or better required for all courses used to satisfy minor requirements with overall GPA in minor requirement courses of 2.000 or better.

Minor Requirements:

- Engineering 188 and Civil Engineering 125 | 8 |
- Select 12 units from: Civil Engineering 126, 127, 128, 143; Environmental Science and Policy 167; Design 136A, 136B, 137A | 12 |

Total Units for the Minor: 18

Minor Advisors: Frank Loge (Civil and Environmental Engineering), Dan Sperling (Western Cooling Efficiency Center)
Engineering: Biomedical

Changes to the Biomedical Engineering Major Program Requirements & Minor Program Requirements

Lower Division Required Courses

Students are encouraged to carefully adhere to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A</td>
<td>Calculus and Analytical Geometry 1</td>
<td>5</td>
</tr>
<tr>
<td>Mathematics 22A</td>
<td>Calculus and Analytical Geometry 2</td>
<td>5</td>
</tr>
<tr>
<td>Physics 9A-9B-9C</td>
<td>Mechanics and Heat I, II, III</td>
<td>15</td>
</tr>
<tr>
<td>Chemistry 2A-2B-2C, 8A-8B</td>
<td>General Chemistry 1, 2</td>
<td>11</td>
</tr>
<tr>
<td>Engineering 6, 17</td>
<td>Engineering Mathematics 1, 2</td>
<td>8</td>
</tr>
<tr>
<td>University Writing Program</td>
<td>1Y, 1V, or IV</td>
<td>1</td>
</tr>
<tr>
<td>or English 3, or Comparative Literature 1, 2, 3, 4, or 5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or Native American Studies 5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Biological Sciences 2A</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Biomedical Electrical Engineering 1, 2, 20</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Minimum Lower Division Units ..... 81

Upper Division Required Courses

Engineering 100 or Electrical and Computer Engineering 100 | 3       |
| Engineering 105 | Biomedical Engineering 116 or Neurobiology Physiology Behavior | 5       |
| Biomedical Engineering 105, 106, 107, 108, 109, 110A-110B | 34      |
| Science electives | 7       |
| Engineering electives | 20      |


Upper Division Composition Requirement, one course from the following: University Writing Program 101; 102 B, E, 104 A, E, F, I, T, or by passing the Upper Division Composition Exam administered by the College of Letters and Science. 

Minimum Upper Division Units ..... 92

Minimum Units Required for Major ..... 157

General Education electives | 24-29 |

Total required units depends on general education requirements in effect at time of matriculation at UC Davis.

Minimum Total Units for B.S. in Biomedical Engineering | 181-186 |

Additional upper division elective policies:

- 2 units from Chemistry 11BAB may be applied towards Science electives if 11BAB are also used to satisfy upper division subject credit.
- 2 units from Electrical and Computer Engineering 100 may be applied towards Engineering electives if Electrical and Computer Engineering 100 is taken to satisfy upper division subject credit.
- 4 units of Biomedical Engineering 199 may be counted towards Engineering or Science electives with approval of Biomedical Engineering Undergraduate Committee.

Science electives and Engineering Electives are to be selected in consultation with a staff or faculty advisor.

Minor Program Requirements:

All courses must be taken for a letter grade. No grade lower than a C- for coursework completed in the minor.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomedical Engineering 117</td>
<td>11, 126, 140, 141, 142, 143, 151, 152, 156A, 161L, 162, 163, 173, 189A, 189C</td>
<td>12</td>
</tr>
</tbody>
</table>

*Electives to be chosen in consultation with the Biomedical Engineering Departmental Adviser.

Engineering: Chemical Engineering and Materials Science

Ahmet Palazoglu, Ph.D., Chairperson of the Department 530-752-6496; Fax 530-752-1031 Department Office, 3001 Ghausi Hall 530-752-0400; Fax 530-752-1031; http://chems.engineering.ucdavis.edu

Changes to the Chemical Engineering and Materials Science Chairperson Contact Information & Major Program Requirements

Chemical Engineering Undergraduate Program

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Mathematics 22A-22B</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Physics 9A-9B-9C</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Chemistry 2A-2B-2C, 8A-8B</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Engineering 6, 17</td>
<td>Engineering Mathematics 1, 2</td>
<td>8</td>
</tr>
<tr>
<td>University Writing Program</td>
<td>1Y, 1V, or IV</td>
<td>1</td>
</tr>
<tr>
<td>English 3, or Comparative Literature 1, 2, 3, 4, or 5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or Native American Studies 5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Biological Sciences 2A</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Biomedical Electrical Engineering 1, 2, 20</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Minimum Lower Division Units ..... 81

Upper Division Required Courses

Chemical Engineering 117, 126, 140, 141, 142, 143, 151, 152, 156A, 161L, 162, 163, 173, 189A, 189C | 12 |

*Electives to be chosen in consultation with the Biomedical Engineering Departmental Adviser.

Chemical Engineering and Materials Science Electives | 12 |

Minimum Total Units for B.S. in Biomedical Engineering | 181-186 |

Chemical Engineering and Materials Science Electives | 21 |

Minimum Upper Division Units ..... 92 |

Minimum Units Required for Major ..... 157 |

Chemical Engineering/Materials Science and Engineering Undergraduate Program

The Chemical Engineering/Materials Science and Engineering program is not accepting new students.

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Mathematics 22A-22B</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Physics 9A-9B-9C</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Chemistry 2A, 2B, 2C or Chemistry 2AH, 28H, 2CH</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Chemical Engineering and Materials Science 5, 6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Engineering 45 or 45Y</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Chemical Engineering 51</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Chemical Engineering 80</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>English 3 or University Writing Program 1, 1V, 1Y Comparative Literature 1, 2, 3, 4</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4 or Native American Studies 5</td>
<td>4</td>
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</tr>
<tr>
<td>Minimum Lower Division Units</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

Upper Division Required Courses

| Materials Science and Engineering 160, 162, 162L, 164, and 172 or 174 | 18 |
| Choose from Materials Science and Engineering 147, 172, 172L, 174, 174L, 180, 181, 182, 188A, or Native American Studies 5 | 4 |
| Upper Division Composition Requirement | 4 |
| Minimum Lower Division Units | 80 |

Honors Program. An Honors Program is available to qualified students in the Chemical Engineering, Biochemical Engineering, and Materials Science and Engineering majors. The Honors Program is also available to the dual majors: Chemical Engineering/Materials Science and Electrical Engineering/Materials Science and Engineering, and Mechanical Engineering/Materials Science and Engineering. The Chemical Engineering and Materials Science Honors Program is a four-year program designed to challenge talented students in these majors. Students invited to participate will take a one-unit honors seminar in their Freshman year and will enroll in various one-unit honors courses. In the upper division, students complete either an honors thesis or a project that might involve local industry (Chemical Engineering 194 HA, HB, HC). Students must maintain a grade point average of 3.50 to continue in the program. Successful com...
### Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course Details</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A-22B</td>
<td>6</td>
</tr>
<tr>
<td>Physics 9A-9B-9C</td>
<td>19</td>
</tr>
<tr>
<td>Chemistry 2A, 2B, 2C, or Chemistry 2AH, 2BH, 2CH</td>
<td>15</td>
</tr>
<tr>
<td>Biological Sciences 2A</td>
<td>5</td>
</tr>
<tr>
<td>Chemical Engineering and Materials Science 3</td>
<td>6</td>
</tr>
<tr>
<td>Chemical Engineering 80</td>
<td>1</td>
</tr>
<tr>
<td>English 3 or University Writing Program 1, 1V, or 1Y, or Comparative Literature 1, 2, 3, 4, or Native American Studies 5</td>
<td>4</td>
</tr>
</tbody>
</table>

### Materials Science and Engineering Undergraduate Program

#### Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course Details</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A-22B</td>
<td>6</td>
</tr>
<tr>
<td>Physics 9A-9B-9C</td>
<td>19</td>
</tr>
<tr>
<td>Chemistry 2A, 2B, 2C or Chemistry 2AH, 2BH, 2CH</td>
<td>15</td>
</tr>
<tr>
<td>Engineering 17, 35, and 45 or 45Y</td>
<td>12</td>
</tr>
<tr>
<td>Chemical Engineering and Materials Science 6</td>
<td>4</td>
</tr>
<tr>
<td>English 3 or University Writing Program 1, 1V or 1Y, or Comparative Literature 1, 2, 3, 4, or Native American Studies 5</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Minimum Lower Division Units | 72 |

### Upper Division Required Courses

<table>
<thead>
<tr>
<th>Course Details</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences 102</td>
<td>3</td>
</tr>
<tr>
<td>Microbiology 101</td>
<td>5</td>
</tr>
<tr>
<td>Chemistry 10A, 128A, 128B, 129A</td>
<td>12</td>
</tr>
<tr>
<td>Biochemical Engineering electives</td>
<td>9</td>
</tr>
</tbody>
</table>

Choose at least one laboratory course from the Laboratory Elective list; additional courses may be chosen from either list. You may receive biochemical engineering elective credit up to a maximum of two units of an internship (192) or independent study (199), or Biotechnology 181 with the approval of a petition, provided that the course is a laboratory-based experimental project, related to the biological and/or biochemical engineering sciences, and the student submits a written report that demonstrates proficiency in laboratory skills, techniques, or methods. Research does not replace the required lab elective.

**Laboratory elective lists:**
- Biomedical Engineering 1611
- Biotechnology 161A, 161B; Food Science and Technology 102B, 104L, 123L; Molecular and Cellular Biology 120L, 160L; Neurobiology, Physiology, and Behavior 101L, 104L; Viticulture and Enology 123L, 124L
- Lecture elective list: Biological Sciences 2B, 2C, 101, 103, 104; Biological Systems Engineering 165; Biomedical Engineering 102, 107, 109, 140, 161A, 162; Biotechnology 160, 188; Chemical Engineering 144, 166, 170; Chemistry 130A, 130B; Food Science and Technology 102A, 104, 123, Microbiology 140, 150; Molecular and Cellular Biology, 123; Neurobiology, Physiology, and Behavior 101, 103; Plant Biology 112; Plant Sciences 100A, 152; Statistics 120, 130A, 131A; Viticulture and Enology 123, 124

#### Upper Division Composition Requirement:
One course from the following (grade of C- or better is required):
- University Writing Program UWP 102E, 102F, 104A, 104T or by passing the Upper-Division Composition Exam

#### Minimum Upper Division Units | 87 |

### Total Units Required for Minor | 159 |

### Engineering: Civil and Environmental

#### Changes to the Civil and Environmental Engineering Major Program Requirements

### Civil Engineering Undergraduate Program

#### Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course Details</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A-22B</td>
<td>6</td>
</tr>
<tr>
<td>Physics 9A-9B-9C</td>
<td>19</td>
</tr>
<tr>
<td>Chemistry 2A, 2B, 2C, or Chemistry 2AH, 2BH, 2CH</td>
<td>15</td>
</tr>
<tr>
<td>Engineering 17, 35, and 45 or 45Y</td>
<td>12</td>
</tr>
<tr>
<td>Chemical Engineering and Materials Science 6</td>
<td>4</td>
</tr>
<tr>
<td>English 3 or University Writing Program 1, 1V or 1Y, or Comparative Literature 1, 2, 3, 4, or Native American Studies 5</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Minimum Upper Division Units | 78 |

### Engineering: Civil and Environmental

#### Upper Division Required Courses

<table>
<thead>
<tr>
<th>Course Details</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering 102, 103, 104, 190</td>
<td>15</td>
</tr>
<tr>
<td>Electrical Engineering 140A</td>
<td>4</td>
</tr>
<tr>
<td>Select one course from Aerospace Science and Engineering 137, 138, Biomedical Engineering 109, Civil and Environmental Engineering 132, 135, 143, or Mechanical Engineering 150A</td>
<td>4</td>
</tr>
<tr>
<td>Select one course from Engineering 180, Mathematics 135A, Statistics 120, 131A, Civil and Environmental Engineering 114, Chemical Engineering 140, Applied Science Engineering 115 OR Physics 104A</td>
<td>4</td>
</tr>
<tr>
<td>Select one course from Chemistry 110A, 124A, 128A, or Physics 108, 108L, 122A, 151, 151A</td>
<td>4</td>
</tr>
<tr>
<td>Civil and Environmental Engineering 132, 135, 143, or Mechanical Engineering 150A</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Upper Division Composition Requirement:
One course from the following (grade of C- or better is required):
- University Writing Program UWP 102E, 102F, 104A, 104T or by passing the Upper-Division Composition Exam

#### Minimum Upper Division Units | 79 |

### Minor Requirements

<table>
<thead>
<tr>
<th>Course Details</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Science and Engineering 160, 162, 164</td>
<td>12</td>
</tr>
<tr>
<td>Select one course from Materials Science 172 or 174</td>
<td>4</td>
</tr>
<tr>
<td>Additional 4 units from the following, if not used above, Materials Science 147, 162L, 172, 172L, 174, 174L, 180, 181, 182 or 18B</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Total Units Required for Minor | 20 |

### Civil Engineering

#### Upper Division Required Courses

<table>
<thead>
<tr>
<th>Course Details</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering 102, 103, 104, 104L, 105, 106</td>
<td>20</td>
</tr>
<tr>
<td>Civil and Environmental Engineering 114, 190</td>
<td>6</td>
</tr>
<tr>
<td>One course from Civil and Environmental Engineering, 153, Mathematics 118A, or Statistics 108</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Minimum Upper Division Units | 83 |

### Water Resources: Civil and Environmental Engineering 141 and 141L and at least
one from courses 142, 144, 145, 146, 152

Senior Design Requirement: Must complete at least two of the following courses as part of the Group Option or Civil & Environmental Engineering elective requirement: Civil & Environmental Engineering 127, 136, 145, 148B, 150, 162, or 173

Civil & Environmental Engineering electives

16

Civil & Environmental Engineering electives may include: Any upper division, letter-graded Civil & Environmental Engineering course not already used towards another degree requirement, and may include, but not exceed, a combination of 6 units from Civil & Environmental Engineering 198 & 199.

Upper Division Composition Requirement: One course from the following: University Writing Program 101, 102E, 102G, 104A, 104E, 104F or by passing the Upper Division Composition Exam offered by the College of Letters & Science. 0.4

*Units in excess of the 30 unit requirement may count toward the Civil & Environmental Engineering elective requirement. Please consult with the undergraduate staff adviser.

**A maximum of 6 units of upper-division courses outside of Civil & Environmental Engineering may be considered on a petition basis. Please consult with the undergraduate staff adviser.

Engineering: Computer Science

Changes to the Computer Science Engineering Major Program Requirements & Minor Program Requirements

Computer Science and Engineering Undergraduate Program

Lower Division Required Courses

Mathematics 21A-21B, 21C, 21D ........ 16
Mathematics 22A or MAT 67-67B ........ 6
Physics 9A-9B, 9C-9D ...................... 9
Chemistry 2A ................................ 5
Engineering 20, 30, 40, 60 ................ 16
Computer Science Engineering 50 or Electrical and Computer Engineering 70 .... 4

Engineering 17 ......................... 4
English 3 or University Writing Program 1, 1Y or Comparative Literature 1, 2, 3, or 4, or Native American Studies 5, 6, 7, 8

Communication 1 or 3 .................... 4

General Education electives ........... 32

Upper Division Requirements:

Upper Division Required Courses

Computer Science Engineering 188 ..... 4
Electrical and Computer Engineering 100, 172, and 180A ....................... 4
Computer Science Engineering 120 or 122A ........................................ 4

Computer Science electives- a minimum of 3 courses and a minimum of 11 units chosen from Computer Science Engineering 120, 122A, 122A†, 129, 130, 140B, 142, 145, 152B, 152C, 153, 158, 163, 165A, 165B, 170, 171, 175, 177, 178, 189 A-M; one course from approved 192 or 199 or Electrical and Computer Engineering

194ABC; Electrical and Computer Engineering 180B ....................... 11

Upper Division Composition Requirement: University Writing Program UWIP 101 or by passing the Upper-Division Composition Exam administered by the College of Letters & Science. 0.4

† Completion of both Computer Science Engineering 120 and 122A will satisfy the computer science major requirement and a computer elective requirement.

The Minor in Computational Biology

The minor in Computational Biology will provide students with engineering, physical or biological majors the foundations necessary to build efficient computational models and algorithms, use state-of-the-art techniques for scientific analysis and create scalable infrastructure environments for biological and biotechnological applications.

Students must take a total of 20 upper-division units, with two required courses and 12 units of upper-division electives, as specified below: A minimum GPA of 2.000 is required for coursework in the minor. Students should note that most of the courses listed below have lower division prerequisites. In particular, required course Engineering: Computer Science 122A has a prerequisite chain of Engineering: Computer Science 20, 30, 40, and 60.

Computational Biology ............... 20

Required courses ........................................ 8

Engineering: Computer Science 122A; 124

Electives ........................................ 12

At least one biology course from the following: Molecular & Cellular Biology 121 124, 161, 182, Evolution and Ecology 100, 102, 104, 131; Biological Sciences 101, 104, 122

At least one computational or statistical course from the following: Engineering: Computer Science 130, 132, 140, 145, 156, 158, 160, 165A, 165B, 170, Evolution and Ecology 175, Statistics 141, 130A; Biotechnology 130; Biological Sciences 132

At least one computational biology and bioinformatics course from the following: Computer Science 129, Biological Sciences 132; Biomedical Engineering 117; Evolution and Ecology 175, Biotechnology 150

Minor Advisors: Lori Avellar, Vladimir Filkov, Dan Gusfield, Patrice Koehl, Bertram Ludaescher, Ilia Tagkopoulos

Engineering: Electrical and Computer Engineering

Changes to the Electrical and Computer Engineering Major Program Requirements

Electrical Engineering Undergraduate Program

Lower Division Required Courses

Mathematics 21A-21B, 21C, 21D .................. 16
Mathematics 22A, 22AL, 22B ................. 7
Physics 9A-9B, 9C-9D ......................... 9
Chemistry 2A .......................... 5
Computer Science Engineering 20, 30, 40, 60 ................ 16

Electrical and Computer Engineering 117, 118, 119, 120, 121, 122, 124, 125, 126, 127, 136, 150, 152B, 163, 171, 175, 176, 178, 188

Technical electives* ........................................ 9

Upper Division Composition Requirement: One course from the following (grade of C or better is required): University Writing Program 101, 102A-L, 104-F or by passing the Upper Division Composition Exam. 0 or 4

Minimum Upper Division Units ..... 74

Computer Engineering Undergraduate Program

Lower Division Required Courses

Mathematics 21A-21B, 21C, 21D .................. 16
Mathematics 22A, 22AL, 22B ................. 7
Physics 9A-9B, 9C-9D ......................... 9
Chemistry 2A .......................... 5

Computer Science Engineering 20, 30, 40, 60 ................ 16

Electrical and Computer Engineering 117, 118, 119, 120, 121, 122, 124, 125, 126, 127, 136, 150, 152B, 163, 171, 175, 176, 178, 188

Technical electives** ........................................ 9

Upper Division Composition Requirement: One course from the following (grade of C or better is required): University Writing Program 101, 102A-L, 104-F or by passing the Upper Division Composition Exam. 0 or 4

Minimum Upper Division Units ..... 74

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer, 2013-2014 offering in parentheses

Pre-Fall 2011 General Education (GE): AHArts & Humanities, SE-Science and Engineering, SS-Social Sciences, DV-Diversity, WR-Writing Experience

Fall 2011 and on General Education (GE): AHArts & Humanities, SE-Science and Engineering, SS-Social Sciences, DV-Diversity, WR-Writing Experience
Engineering: Mechanical and Aerospace Engineering

Changes to the Mechanical and Aerospace Engineering Mission Statement & Major Program Requirements

The Mechanical Engineering/Materials Science program is not accepting new students.

Mission. The Department of Mechanical and Aerospace Engineering is committed to educating future engineers so that they may contribute to the economic growth and well-being of the state, the nation, and the world, and to the advancement of knowledge in the mechanical and aerospace sciences.

Objectives. The objectives of the programs offered in Mechanical and Aerospace Engineering include the following: to prepare its graduates to practice mechanical engineering or aerospace engineering in a broad range of industries, to enable interested graduates to pursue graduate education, to prepare its graduates to participate in research and development, and to offer creative and innovative efforts in science, engineering, and technology to allow interested graduates to pursue entrepreneurial endeavors.

Preparatory Requirements. In order to change to any major offered by the Department of Mechanical and Aerospace Engineering, students must:

- Be a registered student and have completed at least one quarter (minimum of 12 units) at UC Davis;
- Have completed not more than 135 cumulative units (excluding AP units);
- Be in good academic standing and meet minimum progress requirements;
- Have received a letter grade for all courses that satisfy Engineering degree requirements;
- Have: a) completed at least the following five courses: Mathematics 21A, B, C; Physics 9A and Chemistry 2A and b) have a GPA of 2,800 or better in all completed Mathematics, Physics, Biology and Chemistry courses required for your intended major, and have received a C- or better in all of these courses;
- Have no grade lower than a C- in any completed engineering course required for your intended major(s) taken at UC Davis;
- Have a 2,800 UC GPA in completed engineering courses.

Mechanical Engineering Undergraduate Program


Transportation System Suggested Advisers. P.A. Erickson, J.W. Park, S. Velinsky

Mechanical Engineering Program Requirements

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A, B, C</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A, 22B</td>
<td>6</td>
</tr>
<tr>
<td>Physics 9A-9B, 9C-9D</td>
<td>19</td>
</tr>
<tr>
<td>Chemistry 2A-2B</td>
<td>10</td>
</tr>
<tr>
<td>Engineering 4</td>
<td>3</td>
</tr>
<tr>
<td>Engineering 6 or Mechanical Engineering 5</td>
<td>4</td>
</tr>
<tr>
<td>Engineering 17, 35, 45 (or 45Y)</td>
<td>12</td>
</tr>
<tr>
<td>Mechanical Engineering 30</td>
<td>3</td>
</tr>
<tr>
<td>English 3 or University Writing Program 1, 1Y or 1V, or Comparative Literature 1, 2, 3, or 4, or Native American Studies 5</td>
<td>4</td>
</tr>
</tbody>
</table>

Upper Division Required Courses

- Engineering 100, 102, 103, 104, 105, 109
- Mechanical Engineering 134, 135, 151, 152, 162, 163, 154 or 171
- Select one course from Engineering 180, 182, Mechanical Engineering 115, Statistics 131A
- Select one course from System Dynamics/Mechanical Design electives: Engineering 122, Mechanical Engineering 121, 120B, 154 or 171
- Select two courses from these Restricted Electives: Aerospace Science 129, 138, 139, 140, 141, 142; Materials Science and Engineering 130A; 130B; Engineering 190, 191, 197
- Technical Elective Requirement: Four units must be taken from any Upper Division Engineering course, which may include courses from the above System Dynamics/Mechanical Design or Restricted Elective lists if these courses are not used in satisfaction of other degree requirements.
- Geared up for Graduate School/undergraduate research: Computer Science Engineering 188 or any 197 course. Up to 3 units may be used from the following technical electives:
- Agronomic and Resources Economics (ARE) 100A, 100B, 112
- Applied Biological Systems Technology (ABT) 101, 142, 165
- Atmospheric Science (ATM) 149, 160
- Biological Engineering (BID) 2A, 2B, 2C
- Chemistry (CHE) 2C, 2CH, 8A, 8B and any upper division course except CHE 195 and 197
- Economics (ECN) 100, 101, 102, 103, 122
- Engineering (EME, EAE, ENG, BIM, EAD, EBS, ECH, EMS, ECI, ECS, EEC) any upper division course except IEM 110L, ENG 160, 191, 199 (gearing up for grad school/undergraduate research), ECS 188 or any 197 course
- Environmental and Resource Sciences (ERS) 100, 100L, 121, 131, 136, 185, 186, 186L
- Exercise Biology (EB) 102
- Fiber and Polymer Science (FPS) 100 (same as EMS 147)
- Food Science and Technology (FST) 159, 160
- Geology (GEL) 17, 32, 35, 36, 50, 50L, 60, 100, 100L, 101, 101L, 130, 131, 160, 162, 163
- Hydrologic Science (HVD) 110, 124, 134, 141, 142, 143, 144, 146, 151, 182
- Management (MGT) 11A, 11B, 100, 120, 140, 150, 160, 170, 180
- Mathematics (MAT): any upper division course except MAT 197C
- Physics (PHY) 9HE and any upper division course except PHY 160 (restricted to one unit of technical elective for 1977)
- Statistics (STA) any upper division course except 100, 102, 103, 104, 106, 108
- Upper Division Composition Requirement: One course from the following grade of C- or better is required: University Writing Program 101, 102E, 104A, 104E, 104T or by passing the Upper-Division Composition Exam.
- Minimum Units Required for Major: 157
Entomology and Nematology

Change to department name
Formerly Entomology
(Office of Agricultural and Environmental Sciences)

Environmental Policy Analysis and Planning

Change to Environmental Policy Analysis and Planning Major Program Requirements

The Major Program
The major in environmental policy analysis and planning develops an understanding of governmental policy-making and skills for designing and assessing policy in fields related to environmental quality and natural resource management.

Any student in good standing is eligible to transfer to the major; to do so, please see the staff adviser, Melissa Whaley, in 2134 Wickson Hall, or the master adviser, Jim Sanchirico, in 2102 Wickson Hall.

The Program.
This major provides students with a strong background in policy analysis, including the evaluation of policy alternatives and the study of factors affecting policy formulation and implementation.

Key components of this interdisciplinary training include a general background in the natural sciences relevant to environmental policy, mathematics, statistics, and research methodology to quantitatively analyze environmental problems and policy options.

In addition, students are encouraged to develop substantive knowledge in a specific field of environmental policy, such as urban and regional planning, water policy, renewable energy, climate policy, or conservation management.

Career Alternatives.
Environmental policy analysts and planning graduates are prepared for employment in environmental, natural resource, energy, and transportation focused public agencies, consulting firms, and organizations concerned with environmental affairs, or as legislative aides for elected representatives. The major is also excellent preparation for students who wish to go on to graduate work in law, planning, public policy, political science, economics, or business.

B.S. Major Requirements:

English Composition and Public Speaking Requirement

7-8
University Writing Program 101, 102A, 102B, 102G, 104A, 104B, 104C, 104D, 104E, 104F or 104T or by passing the Upper-Division Composition Exam

Preparatory Subject Matter

46-52
Biological Sciences 2A, 10, or 10V ....... 4-5
Chemistry 2A, 3A, 3B, or 3C ......... 5
Plant Sciences 21, or Science & Society 18 ....... 3
Economics 1A, 1B, or 3A ............ 8
Animal Sciences 1, Atmospheric Science 60, Biological Sciences 2B, Environmental Science & Management 100, Geology 1 or 134, Plant Sciences 12, or Wildlife, Fish & Conservation Biology 154 or 155 ....... 3-5
Conservation Biology 131, Energy & Environmental Science & Policy 1 ........... 3-5
Mathematics 16A-16B or 21A-21B ....... 6-8
Physics 1A, 1B or 1C, or 2A ......... 6
Political Science 1, 2, 6, or 10 ....... 4
Statistics 13 or 32 ............... 3-4

Minimum Units Required for Major

170

Division of Aerospace Science and Engineering

Aerospace Science & Engineering Undergraduate Program

Lower Division Required Courses

<table>
<thead>
<tr>
<th>UNITS</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mathematics 21A-21B, 21C-21D ............. 16</td>
</tr>
<tr>
<td></td>
<td>Mathematics 22A-22B ..................... 6</td>
</tr>
<tr>
<td></td>
<td>Physics 9A-9B-PC-9D ..................... 19</td>
</tr>
<tr>
<td></td>
<td>Chemistry 2A-2B or 2A-2B-2BH ......... 10</td>
</tr>
<tr>
<td></td>
<td>Engineering 4 ................................ 3</td>
</tr>
<tr>
<td></td>
<td>Mechanical Engineering 2 ................ 4</td>
</tr>
<tr>
<td></td>
<td>Engineering 5 ................................ 4</td>
</tr>
<tr>
<td></td>
<td>Engineering 27, 31, 43 (or 45Y) ........ 12</td>
</tr>
<tr>
<td></td>
<td>English 3 or University Writing Program 1, 1Y or Y, or Comparative Literature 1, 2, 3, or 4, or Native American Studies 5 ........ 5</td>
</tr>
<tr>
<td></td>
<td>Communication 1 or 3 ..................... 4</td>
</tr>
</tbody>
</table>

Upper Division Required Courses

Engineering 100, 102, 103, 104, 105, 19, Mechanical Engineering 106, 107A & B, 165, 172 ................. 22
Select one course from Engineering 180, Mechanical Engineering 115 or Mathematics 128C ............ 4
Engineering 190 ......................... 3
Technical electives .................... 7

One course must be chosen from the following astronautics electives: Aerospace Science and Engineering 140, 141 or 142

The remaining units must be taken from any Upper Division Engineering course except Bioengineering 110L, Engineering 160, 191, 198 (gearing up for Grad School/undergraduate research), Computer Science Engineering 188 or any 197T course.

Upper Division Composition Requirement:
One course from the following (grade of C- or better is required): University Writing Program 101, 102A, 102B, 102G, 104A, 104B, 104C, 104D, 104E, 104F, 104T or by passing the Upper-Division Composition Exam

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2013-2014 offering in parentheses

Pre-Fall 2011 General Catalog Course Supplement and Policies and Requirements Addendum

Fall 2011 and on General Education (GE): AGH=American Culture; DD=Domestic Diversity; DL=Global Literacy; NS=Science and Engineering; SL=Social Sciences; A=Arts and Humanities; S=Science and Engineering; W=Writing Experience; AQ=Art; D=Domestic Diversity; O=Oral Skills; Q=Quantitative; V=Visual; WC=World Cultures; WE=Writing Experience

Satisfaction of General Education requirement.

Depth Subject Matter

47-51
[Students must take these units on a letter grade basis, and must attain an overall grade point average of 2.000 or higher in the Depth Subject Matter courses.]

Environmental Science & Policy 110, 116, 168A ........... 13
Environmental Science & Policy 168B ........... 4
Environmental Science & Policy 161 ........... 4
Environmental Science & Policy 179 ........... 4
Environmental Science & Policy 175 ........... 4
Select one course from Agriculture & Natural Resources 106, Sociology 106, Statistics 100, 103, or 108 ........... 4-5
Agricultural & Resource Economics 100 or Economics 100 ........... 4
Agricultural & Resource Economics 176 or Environmental Science & Policy 175 ........... 4
Applied Biological Systems Technology 150 or Environmental Science & Policy 179 ........... 4
Select one course from Applied Biological Systems Technology 181N, 182, or Environmental Science & Management 185 or 186 and 186L ........... 4-5

Areas of Specialization

[choose one] ............... 12-17

Students must select courses in the Areas of Specialization that have not been taken in the Depth Subject Matter.

City and Regional Planning

Environmental Science & Policy 171 and 172 .................... 8
Select one course from Civil & Environmental Engineering 162, 165, Environmental Science & Policy 163 ........... 3-4
Select one course from Art History 168, Community & Regional Development 149, 152, 156, or 171, Environmental Science & Policy 110, Environmental Science & Policy 173 or Political Science 100 ........... 2-5

Climate Change Policy

Environmental Science & Policy 165N ........... 3
Select one course from Agriculture & Resource Economics 176, Economics 125, Environmental Science & Policy 163, 167, or 171 ........... 4
Select two courses from Atmospheric Science 116, 133, or 160, Environmental Science & Management 131, Environmental Science & Policy 116N, or Science & Society 25 or 25V ........... 6-8

Conservation Management

Select two courses from ESP 166N, 169, 170, or 172 ........... 8
Select one course from Environmental Horticulture 160, Environmental Science & Management 141, Environmental Science & Policy 100, 121, or 127, Evolution & Ecology 115, 138, or Wildlife, Fish & Conservation Biology 154 or 155 ........... 3-5

Energy and Transportation Planning

Economics 125 or Environmental Science & Policy 175 ........... 4
Select two courses from Civil & Environmental Engineering 162, 165, Environmental Science & Policy 163, 167, or 171, Environmental Science & Policy 175 or 177, Energy and Transportation Planning 128 or 129 ........... 4
Environmental Policy & Politics

Select one course from Political Science 100, 104, 105, 107, or 109 ..................4
Select one course from Political Science 162, 164, 165, or 170 .........................4
Select one course from Civil & Environmental Engineering 165, Environmental Science & Policy 165N, 166N, 167, 169, 170, 171, 172 .................................................. 3-4
Select one course from Agricultural & Resource Economics 106, 176, Civil & Environmental Engineering 153, Economics 130, or Environmental Science & Policy 175 ................................................. 4

Environmental Science

Students choosing the Environmental Science area of specialization should consult with a faculty adviser to identify an emphasis within this specialization and to select four upper division courses with a common theme. Possible areas of emphasis are biological conservation, pollutants in the environment, ecology, planning in the presence of environmental hazards, sustainable development, or environmental economics. If you are considering this area of specialization, please contact the major adviser as soon as possible.

Water Management

Select two courses from Environmental Science & Policy 166N, 169, or Hydrologic Science 150 .................................................. 6
Select one or two courses from section (A) and one or two courses from section (B) for a total of two courses: (A) Environmental Science & Management 100, 121, Environmental Science & Policy 151, 155, Geology 134, Hydrologic Science 141, 143, Soil Science 118, or Wildlife, Fish, & Conservation Biology 120 (B) Biological Sciences 124, Environmental Science & Policy 116N, 124, 150C, or 152 ........................................ 6-8

Total Units for the Degree .......... 112-128

Major Adviser. J. Sanchirico (Environmental Science and Policy)

Minor Program Requirements:

The faculty for environmental policy analysis and planning offers the following minor. The Environmental Policy Analysis minor is for natural and social science students desiring basic training in policy analysis theory and methods.

Environmental Policy Analysis ............ 23-25
Preparation: Economics 1A; basic course in political science.
Environmental Science & Policy 1 ............. 4
Environmental Science & Policy 160, 161, 168A ........................................... 13
Select two courses from Environmental Science & Policy 163, 163N, 166N, 167, 169, 171, 172, or 179 ........................................... 6-8

Minor Adviser. J. Sanchirico (Environmental Science and Policy)

Exercise Biology

Changes to the Major Program Admissions Criteria

Admissions suspended for 2013-2014.

Human Ecology

Change to department name

Formerly Human and Community Development

(College of Agricultural and Environmental Sciences)

Human Development

Changes to the Human Development Major Program Requirements

B.S. Major Requirements:

Preparatory Subject Matter ............... 38-46
Two courses from: Anthropology 1, 2, or 15 ............................................ 8-9
One course from: Biological Sciences 2A, 10, Microbiology 10, or Neurobiology, Physiology, and Behavior 12 .................................... 3-4
One course from: Molecular and Cellular Biology 10 or Biological Sciences 101T ........ 4
One course from: History 17A, 17B, 72A, 728, or Political Science 1 ................. 4
Two courses from Philosophy 5, 30, 31, 32, or 38 ....................................... 8
One course from: Neurobiology, Physiology, and Behavior 10, 101, or Psychology 101 ................................................................. 3-5
Psychology 1 ................................................................. 3
One course from: Psychology 41 or Sociology 46A and 46B, or Statistics 10 or 13 ................................................................. 4-8

Letters and Science, College of

Changes to the Letters and Science College Requirements for the Bachelor's Degree; Other Unit Credit Limitations; Area (Breadth) Requirement; Foreign Language Requirement-A.B. and B.A.S. Degrees

Other Unit Credit Limitations. The following are additional courses that have limits on the number of units that can be counted toward your degree.

- Internship courses (numbers 92, 192): 12 units maximum including internship units taken at other institutions; see Nonstandard courses
- Music 130, 131, 140-150 (combined): 19 units maximum
- Nonstandard courses (92, 97T, 97TC, 99, 192, 194H, 197T, 197TC, 199 and similar courses): 30 units maximum or one-sixth of the units taken at UC Davis, whichever is the smaller; note the separate unit limits on internship, special study and tutoring courses; and major limitations
- Physical Education 1 and 6 (combined): 6 units maximum
- Special Study courses (99, 194H, 199): 5 units maximum in any one quarter; see Nonstandard courses
- Tutoring courses (97T, 97TC, 197T, 197TC): 10 units maximum; see Nonstandard courses, above

Area (Breadth) Requirement

The College Breadth Requirement promotes the intellectual growth of students by asking them to acquire a broader background of knowledge than is provided by the usual major. The Breadth requirement also guides students in exploring the interdependence of knowledge.

A.B. Degree. Satisfaction of the campus General Education requirement.

B.S. Degree. A total of 90 units in natural sciences/mathematics; units used in satisfaction of the campus General Education requirement in Science and Engineering topical breadth may also be used to satisfy this requirement.

Courses numbered 92, 97T, 97TC, 99, 192, 197T, 197TC, 199 and from 200 through 499 cannot be counted toward satisfaction of the natural sciences/mathematics Area requirement. A maximum of 10 units in special study courses (99, 194H, 199) may be counted toward that portion of the Area requirement. Subject to the restrictions just listed, courses acceptable for fulfilling the 90-unit natural sciences/mathematics Area requirement are:

Natural Sciences and Mathematics

- Anatomy, Physiology and Cell Biology
- Anthropology 1, 5, 15, 151, 152, 153, 154A, 154BN, 156A, 156B, 157, 158
- Astronomy
- Avian Sciences 13
- Biological Sciences
- Cell Biology and Human Anatomy 101, 101L
- Chemistry
- Engineering 6, 10, 35, 102
- Engineering: Biomedical 126
- Engineering: Electrical and Computer 70, 170, 173A
- Entomology 10, 100, 153
• Environmental and Resource Sciences 30, 131
• Environmental Science and Policy 30, 100, 121
• Environmental Toxicology 101
• Evolution and Ecology
• Exercise Biology 101, 103, 106, 106L,
  110, 111, 112, 113, 115, 116, 117, 126
• Fiber and Polymer Science 110
• Food Science and Technology 100A, 100B, 101A, 101B
• Geology
• Integrated Studies 8A
• Mathematics
• Microbiology
• Molecular and Cellular Biology
• Neurobiology, Physiology, and Behavior
• Nutrition 10, 111AV, 111B
• Pathology, Microbiology, and Immunology 126
• Physical Education 133, 135
• Physics
• Plant Biology
• Psychology 41, 100, 101, 103A, 103B,
  104, 113, 121, 122, 123, 124, 126, 127,
  129, 130, 131, 135, 146, 180B
• Statistics
• Wildlife, Fish, and Conservation Biology 10

**Foreign Language Requirement; A.B. and B.A.S. Degrees**

A key component of liberal education, the study of another language exposes students to a ubiquitous and highly diverse component of human behavior and interaction. Language learning enables students to communicate effectively in an increasingly internationalized world, enhances their ability to understand ways of thinking different from their own, gives them direct access to cultural production from another time and place, awakens in them awareness of the conditioned nature of their assumptions about the world, and trains them to cope more effectively with intellectual and practical problems they may face in their future careers.

The College of Letters and Science encourages its students to acquire functional proficiency in at least one language other than English before graduating. At a minimum, the College requires A.B. candidates to complete three sequenced quarters (15 units) of courses, or its equivalent, in one foreign language. B.S. candidate requirements are determined by their respective major program.

The Foreign Language Requirement may be satisfied in any language offered at UC Davis, including ancient languages, or which is normally taught at - and for which transfer credit is allowed - from another institution, including American Sign Language. Students may also satisfy this requirement by examination in a language not offered on the UC Davis campus (see below).

**Satisfaction of the Requirement**

At UC Davis or Another Accredited Institution. You may satisfy the requirement by taking 15 quarter units of one foreign or classical language offered at UC Davis. You may also fulfill this requirement by taking the equivalent number of transferable quarter units in one foreign language at an accredited institution.

Transfer students should consult the Transfer Credit Evaluation, which is issued by the Deans’ Office within a quarter after their first enrollment at UC Davis. Students planning to continue to study the same language at UC Davis must consult the relevant language coordinator.

If you have successfully completed the second or third year of a language in the tenth or higher grade in high school, you may receive unit credit for course 1 of that language when taken at UC Davis, but the grading mode will be P/NP only. Although a Passed or Not Passed grade will be charged to your P/NP option, no petition is required; see Pass/Not Passed (P/NP) Grading in the Academic Information chapter.

Through Study Abroad. Certain study abroad programs offered by UC Davis through the Education Abroad Center, UC Education Abroad Program and other accredited institutions may be used to satisfy the requirement. Some of these programs do not have a language prerequisite, but others do. If you intend to apply for a study abroad program with a language prerequisite, you should plan on completing the relevant foreign language requirement by the end of your second or third year, depending on the program.

With the Intersegmental General Education Transfer Curriculum (IGETC). IGETC is a series of courses which prospective transfer students attending California community colleges may complete to satisfy the lower division breadth/general education requirements at the University of California. Students may satisfy the Foreign Language requirement by attaining certification of IGETC completion.

By Examination: Proficiency Exam. The Language Learning Center (LLC) offers proficiency tests in numerous languages. A proficiency test does not yield unit credit - it only determines whether the Foreign Language requirement has been met or at which point in the language sequence you should enroll. Students must follow the language program’s placement policy if they decide to study the language at UC Davis.

By Examination: Standardized Tests. College Board Subject Test: Earning a qualifying score of at least 550 on a College Board Foreign Language Subject Test satisfies the requirement. This test may be taken at any time during your high school career. Once your score is on file at Undergraduate Admissions, notify the Letters and Science Deans’ Office so that satisfaction of the College requirement can be noted on your record.

College Board Advanced Placement Examination. A score of 5, 4 or 3 on any foreign language College Board Advanced Placement Examination, with the exception of Latin, taken in high school will satisfy the Foreign Language requirement.

International Baccalaureate Higher Level Examination. A score of 7, 6, or 5 on the French A1, A2, or B Examination, the German A1, A2 or B Examination, the Italian A1 Examination, the Latin Examination, the Portuguese A1, A2 or B Examination, or the Spanish A1 Examination taken in high school will satisfy the Foreign Language requirement.

By Examination: Other means. If you have not completed the required level language course, but assume you have attained equivalent language fluency and cultural knowledge, you may satisfy the language requirement by passing a proficiency examination. For more information, consult the appropriate foreign language department.

You may validate your knowledge of a language acquired by any means before matriculating at UC Davis by taking a proficiency test or another form of evaluation (if available in the relevant language department). A test may not be taken, however, in a language for which you have already received degree credit.
Managerial Economics

Changes to the Managerial Economics Major Program Requirements

(As of 2012-2013; see Department of Agricultural and Resource Economics for current requirements)

Faculty. See Agricultural and Resource Economics, on page 141.

The Major Program

The Managerial Economics major at UC Davis is a disciplinary program combining strong preparation in microeconomic theory and quantitative methods. It prepares students for the analysis of management and policy issues in business, finance, marketing, production, agriculture, food distribution, natural resources, the environment, resource allocation, and international development. Students specialize in one of three options: (1) Managerial Economics focuses on the economic aspects of managerial decision-making. (2) Environmental and Resource Economics concentrates on issues related to the use of resources and environmental quality. (3) Agricultural Economics focuses on the economic and policy aspects of production and marketing of foods and fibers. Students in the Managerial Economics program develop valuable skills and strengths that lead to careers in business and government.

Internships and Career Alternatives. Students in managerial economics have opportunities to gain additional career information and preparation through internships in a variety of private business and governmental agencies. Graduates qualify for supervisory and management training positions in banking, finance, commodity and stock brokerages in the private sector, farm and ranch production, food and agricultural processing, agricultural sales and service, and a variety of agency career positions in local, state, and federal government. Graduates are well qualified to seek advanced degrees in agricultural and resource economics, economics, business administration, or law. For more information, see http://ccwweb.ucdavis.edu.

B.S. Major Requirements: UNITS

English Composition Requirement ................. 4

In addition to the College English Composition requirement, choose one course from English 3, 10, by Writing Program 1, 18, 19, 101, 102A-G, 104A-F

Preparatory Subject Matter ............... 35-37

Plant Sciences 21, Engineering Computer Science 10, 15, or 30 ......... 3-4
Economics 1A-1B ......................... 8
Economics courses must be taken for a letter grade
Management 11A-11B ..................... 3-4
Mathematics 16A-16B or 16A-16B-16C or 21A-21B ...................... 8-9
Mathematics courses must be taken for a letter grade
Statistics 103 ............................. 8
Statistics must be taken for a letter grade

Major Breadth .................................. 37
Social Science, Natural Science, and Agricultural Science
* See course requirements for the major at http://manecon.ucdavis.edu

Total Depth Subject Matter ................. 52

Core ........................................ 20
Agricultural and Resource Economics 100A, 100B, 106, 155 ................. 16
Economics 101 ................................ 4

Restricted Electives ............................ 32
Choose at least one of the options below:

Managerial Economics option
Agricultural and Resource Economics 18

Environmental and Resource Economics option
Agricultural and Resource Economics 175, 176 .............................. 8
Choose at least 18 units from Agricultural and Resource Economics 15, 120, 138, 145, 146, 150, 156, Economics 123, 125, 130, Environmental Science and Policy 168A, 168B, 178. Select the remaining 6 units from the aforementioned courses or upper division courses in Agricultural and Resource Economics and/or Economics, Environmental Science and Policy 160, 161, 163, 165, 166, 167, 171, 172, 173, Environmental Toxicology 138

Managerial Economics option
Choose at least 15 units from Agricultural and Resource Economics 120, 130, 132, 138, 139, 140, 145, 150. Select the remaining 17 units from the aforementioned courses, Agricultural and Resource Economics 18, or upper division courses in Agricultural and Resource Economics and/or Economics

* Students graduating with this major are required to attain at least a C average (2.00) in all upper division courses taken at the University in the depth subject matter. All core and restricted electives must be taken for a letter grade.

Total Units for the Major.................................................. 128-130

Student Advising for the major is in 1176-A Social Sciences and Humanities Building (530) 754-9356.

Major Advisers. Contact Department Office

Minor Program Requirements:
The Department of Agricultural and Resource Economics offers four minor options for students majoring in other disciplines who wish to complement their study programs with a minor in Managerial Economics. Each option requires Agricultural and Resource Economics 100A, which has prerequisites of Economics 1A-1B and Mathematics 16A-16B. For some courses, Statistics 13 and 103 may also be required. Variable-unit courses and lower division courses are not accepted in any option.

To qualify for a minor in Managerial Economics, a student must complete the following courses for a letter grade:
Economics 1A and 1B ........................................ 8 units
Mathematics 16A-16B or 21A-21B ............... 6-8 units
Statistics 13 ........................................ 4 units

Managerial Economics ........................... 18

General emphasis
Agricultural and Resource Economics 100A or the equivalent .................. 4
Additional upper division courses in Agricultural and Resource Economics ......... 14

Managerial Economics emphasis
Agricultural and Resource Economics 100A or the equivalent .................. 4
Additional upper division courses in Agricultural and Resource Economics ......... 14

Environmental and Natural Resource Economics emphasis
Agricultural and Resource Economics 100A or the equivalent .................. 4
Additional upper division courses in Agricultural and Resource Economics ......... 14

Agricultural Economics emphasis
Agricultural and Resource Economics 100A or the equivalent .................. 4
Additional upper division courses in Agricultural and Resource Economics ......... 14

Agricultural Economics emphasis
Agricultural and Resource Economics 100A or the equivalent .................. 4
Additional upper division courses in Agricultural and Resource Economics ......... 14

Graduate Study. See Graduate Studies, on page 111.

Mathematics

Changes to Mathematics Major Program Requirements

A.B. Major Requirements: UNITS

Preparatory Subject Matter .......... 43-50
Mathematics 12 (or high school equivalent) ........................................ 0-3
Mathematics 67, or 22A and 108 ............. 4-7
Computer Science Engineering 30 and Mathematics 22AL, or equivalent basic knowledge of MATLAB or Engineering 6 or 5 Additional non-Mathematics courses chosen from natural sciences .................. 12
NOTE: Basic knowledge of MATLAB is required in both MAT67 and 22A. Students can learn it on their own, enroll in ENG6 or in the one unit course MAT22AL (can take concurrently).

Depth Subject Matter ................. 34-38
A. Entry Level (Optional) ................. 0-4
(Suggested choices: one course from Mathematics 108, 114, 115A, 141, 145)
B. Core .................................... 16
Mathematics 125A .......................... 4
Mathematics 125B .......................... 4
Mathematics 135A .......................... 4
Mathematics 150A .......................... 4
C. Choose one Plan from the following two: (up to 4 of these 18 units may be approved upper division courses outside of the Department of Mathematics with extensive use of mathematics) ............. 18

Plan 1: General Mathematics
Additional upper division mathematics units selected in consultation with and subject to approval of an adviser .................. 18

Plan 2: Secondary Teaching
Mathematics 111 ................................ 4
Mathematics 115A .......................... 4
Mathematics 141 ................................... 4

Additional upper division mathematics units selected in consultation with and subject to approval of an adviser. ....... 6

NOTE: Students who wish to satisfy the single subject matter waiver for the teaching credential should see an adviser as early as possible.

Total Units for the Major .................. 77-84

Applied Mathematics

B.S. Major Requirements:

Preparatory Subject Matter .................. 42-52

Mathematics 12 (or high school equivalent) ........................................ 0-3

Mathematics 21A, 21B, 21C, 21D, 22B, 25, 29, 1923 ....... 8

Mathematics 25, 67, 68 ........................................ 8

Mathematics 67, or 22A and 108 ............. 4-7

Mathematics 22AL or equivalent basic knowledge of MATLAB.......................... 0-1

Computer Science Engineering 30, 40 ....... 8

One two-semester sequence from Physics 9A-9B; Biological Sciences 2A-2B; Chemistry 2A-2B; Economics A.1.B, Statistics 32, 102, or other applied preparatory courses approved by your adviser. .......... 7-10

NOTE: Basic knowledge of MATLAB is required in both MAT 67 and 22A. Students can learn it on their own, enroll in ENG 6 or in the one unit course MAT 22AL (can be taken concurrently).

Depth Subject Matter .................. 48-52

A. Entry Level (Optional) .................. 0-4

(Suggested choices: one course from Mathematics 108, 114, 115A, 141, 145)

B. Core ....................................... 32

Mathematics 150A ........................................ 4

Mathematics 135A ........................................ 4

Mathematics 125A ........................................ 4

Mathematics 125B ........................................ 4

Mathematics 135B ........................................ 4

Mathematics 128A ........................................ 4

Mathematics 128B ........................................ 4

Mathematics 185A ........................................ 4

C. Enrichment Courses .................. 16


2. Choice of one course from Mathematics 119A, 124, 128A, 128B, 129, 133, 167, 168 or one approved upper division course outside the Department of Mathematics with extensive use of mathematics ........... 4

Plan 2: Mathematics for Secondary Teaching

A. Entry Level (Optional) .................. 0-4

(Suggested choices: one course from Mathematics 108, 114, 145)

B. Core ....................................... 28

Mathematics 150A ........................................ 4

Mathematics 135A ........................................ 4

Mathematics 125A ........................................ 4

Mathematics 125B ........................................ 4

Mathematics 135B ........................................ 4

Mathematics 111 ........................................ 4

Mathematics 114 ........................................ 4

Mathematics 141 ........................................ 4

C. Enrichment .................. 16


2. Choice of one course from Mathematics 115B, 141, 150A, 150B, 150C, 150D, 150E ........................................ 4

Total Units for the Major .................. 85-94

Mathematical and Scientific Computation

B.S. Major Requirements:

Preparatory Subject Matter .................. 35-42

Mathematics 12 (or high school equivalent) ........................................ 0-3


Mathematics 67, or 22A and 108 ............. 4-7

Computer Science Engineering 30 and

Mathematics 22AL (or equivalent basic knowledge of MATLAB) or Engineering 6 or

2. Physics 9A, 9B, 11A, 11B and 1 or 2 or one course from Physics 7A, Statistics 32, 100 or 102 (Plan 2) .......................... 3-4

NOTE: Basic knowledge of MATLAB is required in both MAT 67 and 22A. Students can learn it on their own, enroll in ENG 6 or in the one unit course MAT 22AL (can be taken concurrently).

Depth Subject Matter .................. 48-52

A. Entry Level (Optional) .................. 0-4

(Suggested choices: one course from Mathematics 108, 114, 115A, 141, 145)

B. Core ....................................... 28

Mathematics 150A ........................................ 4

Mathematics 135A ........................................ 4

Mathematics 125A ........................................ 4

Mathematics 125B ........................................ 4

Mathematics 135B ........................................ 4

Mathematics 128B ........................................ 4

Mathematics 128C ........................................ 4

C. Enrichment .................. 12


D. Choose one Emphasis from the following two courses ........................................ 8

Computational and Mathematical Biology Emphasis

Mathematics 124 ........................................ 4

One approved upper division course in Biology ........................................ 4

Computational and Mathematics

Emphasis

Mathematics 168 ........................................ 4

One approved upper division course involving extensive computational theory of computation ........................................ 4

Total Units for the Major .................. 83-94

Medicine, School of

PREPARING FOR THE STUDY OF MEDICINE

When you apply to the School of Medicine, you must submit the results from the Medical College Admission Test (MCAT), so it is recommended that you take the MCAT by the spring before application. Information can be obtained at your undergraduate institution or directly from MCAT Program, Box 4056, Iowa City, IA 52243 (319) 337-1357. To be acceptable for the fall entering class, the MCAT must be taken no later than the previous fall. No scores older than three years from June of the year you apply will be accepted. Applicants must also meet the following academic requirements.

A. Completed at least three years of study in an accredited college or university in the United States. A minimum of 90 semester hours or 135 quarter units of college-level work is required. Courses in highly specialized fields are acceptable only at the discretion of the medical school.

B. Physicians should have a broad college level education in the natural, social, and behavioral sciences and the humanities. We require the MCAT and three years (90 semester hours or 135 quarter hours) in an accredited college or university that include the specific requirements listed below.

C. Required college-level courses (verified by AMCAS):

- Biological Sciences: 1 year
- Chemistry, general and organic

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2013-2014 offering in parentheses

Pre-Fall 2011 General Education (GE): AJH—Arts and Humanities; S—Science and Engineering; SS—Social Sciences; ACH—American Cultures; DD—Domestic Diversity; WE—Writing Experience

Fall 2011 and on General Education (GE): A—Arts and Humanities; S—Science and Engineering; SS—Social Sciences; ACH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; DL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

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sequence: 2 years

- Physics: 1 year

Technical, Non-Academic Standards are also required. Please click here for more information.

Also see Premedical Requirements.

D. Demonstrate the potential to perform academically at least as well as the average of the current first year class. This reflects the School of Medicine’s generally higher standards and our emphasis on potential as judged from the application as a whole, including but not limited to MCAT and GPA scores.

For additional information, contact the School of Medicine Admissions Office at (916) 734-4800.

APPLYING FOR ADMISSION

Applicant Selection. The class entering in the fall will be limited to 105 students selected on the basis of academic achievement, academic promise and personal characteristics. The Admissions Committee uses these criteria to determine if a candidate will be able to complete satisfactorily the requirements of the medical curriculum and become excellent medical practitioners. Factors taken into consideration include scholastic records, Medical College Admission Test performance and reports of teachers, advisers and interviewers with regard to intellectual capacity, motivation, emotional stability and personal dedication.

The majority of openings in the entering class will be awarded to students who are California residents. However, the School of Medicine participates in the program of the Western Interstate.

Also see Admissions Criteria.

PROGRAM OF STUDY

Combined Degree Program. In addition to the Doctor of Medicine degree, the School of Medicine at UC Davis offers a variety of dual-degree programs through coordination with other graduate groups and divisions. These advanced degrees can couple the M.D. degree with the M.P.H., Ph.D. and M.B.A. that train physicians to meet, respond to and solve the broad diversity of problems and dilemmas facing current and future health care. A new five-year program for students interested in telecommunications-enhanced rural medicine is available.

We also have three Underserved Communities Leadership Tracks in rural, valley, and urban. For more information, see http://www.ucdmc.ucdavis.edu/mdprogram/rural_prime/ & http://www.ucdmc.ucdavis.edu/mdprogram/svprime/index.html.

Medieval and Early Modern Studies

Changes to Medieval and Early Modern Studies Major Program Requirements

A.B. Major Requirements:

Preparatory Subject Matter .......................... 22

Preparatory Subject Matter .......................... 22

Medieval Studies 20A, 20B .......................... 10

Three additional courses chosen from: Art History 18, 1C, 1E; Comparative Literature 2, 10A, 10B, 10C, 10D, 10E; English 10A, 46A; German 48; History 4A, 4B; Humanities 1*, 9; Philosophy 21, 22 .... 12

Language proficiency is a desideratum. Courses in Latin and other European languages are strongly recommended, particularly for students planning to pursue graduate studies in the medieval or early modern field.

Microbiology and Molecular Genetics

Change to department name & Related Courses.

Formerly Microbiology

Related Courses. The offerings of the Department of Microbiology and Molecular Genetics are augmented by courses in Food Science and Technology; Medical Microbiology; Molecular and Cellular Biology; Pathology, Microbiology, and Immunology; Plant Pathology; and Soil Science.

Faculty of the Department of Microbiology and Molecular Genetics also teach or participate in the following courses: Biological Sciences 2A, 101 104 and 181.

Music

Changes to the Music

Undergraduate Major, Honors & Minor Program Requirements

A.B. Major Requirements:

Preparatory Subject Matter .......................... 27-45

Music 6A, 6B, 6C .......................... 9

plus Music 2A, 2B, 2C .......................... (0-6)*

and Music 16A, 16B, 16C .......................... (0-6)*

Music 7A, 7B, 7C .......................... 9

plus Music 17A, 17B, 17C .......................... (0-6)*

Music 24A, 24B, 24C .......................... 9

May be excused by diagnostic examination at the beginning of each quarter.

Depth Subject Matter .......................... 36-40

Choose upper division courses from one of the following tracks:

Track 1: Music Composition

Music 124A, 124B .......................... 6

Music 121 or 122 .......................... 4

Music 131 [one year] .......................... 3

Music 195 .......................... 2

At least 6 units selected from Music

140-150 .......................... 6

Music 101A, 101B .......................... 3

Music 103 .......................... 3

At least 4 further units selected from Music


Track 2: Music History, Theory, and Ethnomusicology .......................... 40

Music 124A, 124B .......................... 6

Music 121 and/or 122 .......................... 8

(Need 8 units of seminar courses chosen from above in any combination. Note: Music 121 and 122 may be repeated for credit.)

Music 131 [one year] .......................... 6

Music 195 .......................... 2

At least 6 units selected from Music

140-150 .......................... 6

At least 12 further units selected from Music


Track 3: Music Performance .......................... 37

Music 124A, 124B .......................... 6

Music 121 or 122 .......................... 4

Music 131 [one year] .......................... 6

Music 195 .......................... 2

At least 13 units selected from Music

131, 140-150 .......................... 13

At least 6 further units selected from Music


Total Units for the Major .......................... 64-85

Note: A maximum of 19 units in performance courses (Music 131, 140-150) apply toward the degree, see Unit Credit Guidelines, College of Letters and Science degree requirements section. Academic Senate By-Law 51c makes it possible for students to take more than 19 units of performance classes without those additional units counting toward the 225-unit cap on units.

Composition Honors .......................... 43-47

Music 101A, 101B .......................... 6

Music 124A, 124B .......................... 8

Music 103 .......................... 3

Music 121 or 122 .......................... 6

Music 131 [one year] .......................... 6

At least 6 units selected from Music

140-150 .......................... 6

Two quarters of Music 194H for a total of at least 6 units resulting in a Senior thesis .......................... 6

At least 4 further units from Music


Music History, Theory and Ethnomusicology

Honors .......................... 44

Music 124A, 124B .......................... 6

Music 121 or 122 (twice) .......................... 8

Music 131 [one year] .......................... 6

At least 6 units selected from Music

140-150 .......................... 6

Two quarters of Music 194H for a total of at least 6 units resulting in a Senior thesis .......................... 6

At least 12 further units selected from Music


A student becomes eligible for graduation with honors by meeting the minimum GPA and course requirements established by the College of Letters and Science. To qualify for high or highest honors, students must also complete the Music Department honors program with a GPA of 3.500 or above and
write a thesis or submit a portfolio that meets the criteria for high honors or highest honors. Students apply to participate in the department honors program during the latter part of their junior year. Admission to the program is based on GPA, a thesis proposal, examples of previous writing, and the recommendation of a faculty member who is willing to sponsor the student’s project. Students who anticipate seeking admission to the honors program are urged to complete at least one offering of Music 121 or 122 before the end of their junior year. Interested students are urged to consult with faculty in their field early in their junior year.

Major Advisers. J. Thomas (A-F), A. Triest (G-M), M. Felo (N-Z)

Minor Program Requirements:

Music ................................................... 22

A minimum of 16 units of upper division music courses ................. 16
A minimum of 6 units in upper division music performance courses .......... 6
Courses chosen from: Music 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150

Neurobiology, Physiology, and Behavior

Changes to Neurobiology, Physiology, and Behavior B.S. Major Requirements:

B.S. Major Requirements: UNITS

Preparatory Subject Matter.............55-65

Preparatory Subject Matter

Biological Sciences 2A-2B-2C .......... 14
Chemistry 2A-2B-2C ................. 15
Chemistry 8A-8B or 118A-118B-118C .................................... 6-12
Mathematics* 17A-17B-17C or 21 A-21B [21C recommended] .............. 8-12
Physics 7A-7B-7C ..................... 12
*Mathematics 16A-16B-16C accepted to fulfill this requirement only for transfer students admitted prior to fall 2013.

Depth Subject Matter.................44-49

Biological Sciences 101, 105 [or 102 + 103], 104 .................................... 10-13
Neurobiology, Physiology, and Behavior 100, 101, 102 .................................. 12
Select three or more units of laboratory course work from the following list: 3-5 Neurobiology, Physiology, and Behavior 100, 101, 104, 106, 111L, 124, 141P, 150, 1941; other courses with the approval of the master adviser.
Statistics 100 .................................. 4
Additional Neurobiology, Physiology, and Behavior depth unit requirement ........ 12
All other Neurobiology, Physiology, and Behavior courses not used in satisfaction of any other requirement; or Anthropology 154A, 154BN, or Entomology 104; or Exercise Biology 101, 102, 111. Courses 192, 197L, 199 may not be used to satisfy the depth unit requirement.
One course from Anthropology 151, Evolution and Ecology 100, Geology 107 .......... 3-4

Total Units for Major ......................99-115

Changes to Neuroscience Minor Program Requirements

Minor Program Requirements: Neuroscience ............................................. 18

Neurobiology, Physiology, & Behavior 100 .......................................... 4
Five courses from:
Choose at least four from the following: Neurobiology, Physiology, & Behavior 107, 112, 124, 126, 160, 161, 162, 164, 165, 166, 167, 168, 169
One of the following may be completed to fulfill the course requirement:
Psychology 113, 121, 129, 135
Linguistics 175, Philosophy 103, Human Development 183
The following courses are cross-listed and either offering can be used to fulfill the course requirement: Neurobiology, Physiology, & Behavior 124/Neuroscience 124, Neurobiology, Physiology, & Behavior 160/Neuroscience 160

Physics

Changes to Applied Physics Major Program Requirements

B.S. Major Requirements: UNITS

Preparatory Subject Matter.............49-56

Physics 9A, 9B, 9C, 9D or 9HA, 9HB, 9HC, 9HD, 9HE ........................................ 19-25
Mathematics 21A, 21B, 21C, 21D, 22A, 22B ............................................... 22
Computer Science Engineering 30 [or equivalent programming course] .......... 4
Depending on area of concentration:
Chemistry 22A or 21B, 22C [21C recommended] ........................................... 8-12
or Computer Science Engineering 40 or Mathematics 22AL ............................... 4-5

Psychology

Changes to Psychology Major Program Requirements

Preparatory Requirements. Before declaring a major in psychology, students must complete the following courses with a combined grade point average of at least 2.50. All courses must be taken for a letter grade. (Students in the Bachelor of Science, Biology program must complete Biological Sciences 2A-):

Preparatory Requirements

Psychology 1, 41 .................................. 8
Statistics 13 or 102 .................................. 4
Biological Sciences 2A
or Biological Sciences 10 and one course from Anthropology 1, Molecular and Cellular Biology 10, Neurobiology, Physiology, and Behavior 10, .......................... 4 or 8

Repeating Courses

Changes to the Repeating Courses

Undergraduate students may only repeat courses in which they received a D, F or NP. Courses in which students received a grade of D or F may not be repeated on a P/NP grading basis. (Courses in which a grade of NP was received may be repeated on a P/NP grading basis.)

Degree credit for a repeated course will be given only once, but the grades assigned for both the first and second time a course is taken will appear on the student's transcript. In computing the GPA of undergraduates who have received a grade of D or F, only the grade and corresponding grade points earned the second time a course is taken will be used, up to a maximum of 16 units for all repeated courses. After the 16-unit maximum is reached, the GPA shall be based on all grades assigned and total units attempted.

Repeating a course more than once requires approval by the appropriate college dean. Departments may restrict the repetition of a course if it is a prerequisite to a course the student has already completed with a grade of C– or better.

Graduate students, with the consent of the appropriate graduate adviser and the dean of Graduate Studies, may repeat any course in which they received a C, D, F or U, up to a maximum of 9 units for all courses repeated. Courses in which a grade of C, D or F has been earned may not be repeated on an S/U basis. Courses in which a grade of U as received may be repeated on an S/U basis.

Degree credit for a repeated course will be given only once, but the grades assigned for both the first and second time a course is taken will appear on the student's transcript. In computing the GPA of graduate students who have received a grade of C, D or F only the most recently earned grade for each course and corresponding grade points will be used, up to a maximum of 9 units for all courses repeated. After the 9-unit maximum is reached, the GPA shall be based on all grades assigned and total units attempted.
Sociology

Changes to the Sociology Major Program Requirements

Sociology

A.B. Degree Requirements:

General emphasis:

Preparatory Subject Matter ....................... 28-29

Sociology 1, 46A, and 468 ................. 13

Sociology 2, 3, 4, 5, 11, 25, 30A, or 30B ....... 3-4

Anthropology 2 or 20 .......... 4

Select from History 4A, 4B, 4C, 6, 7A, 7B, 7C, 8, 9A, 9B, 10A, 15, 17A, 17B ........ 4

Select from Philosophy 5, 14, 24 ........ 4

Depth Subject Matter ............................. 44

(A) Sociology 100 ....................... 4

(B) Select one course from each of the following four categories:

1. Individual, Culture and Society: Sociology 125, 126, 135 ......... 4

2. Stratification and Social Differentiation: Sociology 130, 132, 140 .... 4

3. Organizations and Institutions: Sociology 118, 131, 146, 180A .... 4

4. Social Dynamics: Sociology 104, 141, 143A, 170 ......... 4

(C) Select three upper division courses from one of the following clusters, not counting courses taken to fulfill requirement B ...... 12

1. Individual, Culture and Society: Sociology 102, 120, 122, 125, 126, 127, 128, 129, 131, 132, 134, 135, 137, 138, 140, 142, 152, 153, 172, 173, 174, 175, 176

2. Stratification and Social Differentiation: Sociology 117, 128, 133, 135, 140, 145A, 145B, 171, 172, 185, 188, and not more than one of the following courses: African American and Native American Studies 123; Asian American Studies 100; Chicana/o Studies 110; or Native American Studies 115

3. Organizations and Institutions: Sociology 118, 123, 133, 139, 144, 146, 149, 150, 151, 154, 155, 159, 160, 180A, 180B, 181, 182, 183, 185


5. Student-Initiated Thematic Cluster: developed with a faculty adviser and approved by the Sociology Undergraduate Curriculum Committee

(D) Eight units of Sociology beyond courses taken to fulfill above requirements, and outside of the course cluster used to fulfill requirement C ........ 8

(E) One additional elective upper division Sociology course not already used to fulfill other major requirements. May use Sociology 190X, 191, 192/193, 194HA-194HB, 195 ........ 4

Total Units for the Major ...................... 72-73

Social Services emphasis:

Preparatory Subject Matter ..................... 26-28

Sociology 2, 3; 46A and 468 .......... 16

Psychology 1 ......................... 4

Select from American African and Chicana/o Studies 10, 15; Asian American Studies 1, 2; Chicana/o Studies 10, 50; Native American Studies 1, 10, 30A, or 30B .......... 4

Depth Subject Matter ......................... 44

Sociology 131, 140, 185 .............. 12

Psychology 140, 142, 151, or 168 ......... 4

Select courses from the following categories:


3. Race and Ethnicity: African American and African Studies 100; Asian American Studies 110, 111, 150; Chicana/o Studies 110; Community and Regional Development 176; Native American Studies 115; Sociology 129, 130, 134, 137, 172, 174, 175, 176


5. Gender: Sociology 132, 133, 145B, 172

6. One additional elective Sociology course not already used to fulfill other major requirements. May use Sociology 190X, 191, 192/193, 194HA-194HB, 195 ........ 4

Total Units for the Major ...................... 70-72

Comparative Studies and World Development emphasis:

Preparatory Subject Matter .................... 29-59

Sociology 1, 5, 46A and 468 ........ 17

Economics 1 ......................... 4

Anthropology 2 or 20 ............ 4

History 10C or Political Science 2 .......... 4

Course work in one modern foreign language at the two-year level or provide proof of proficiency ........ 27-30

Depth Subject Matter ......................... 48

Sociology 100, 104, 141, 145A, 170, 20

Anthropology 126A, 126B, or Economics 115A ........ 4

Anthropology 127; Sociology 118, 130, 131, 142A, 144, 145B, 156, 158 ......... 12

Regional focus, three courses from one of the following groups ............... 12

1. Africa: African American and African Studies 110, 111, 162; Anthropology 140A, 140B; History 115A, 115B, 115C, 116; Political Science 134, 149

2. Latin America: African American and African Studies 107A, 180; Anthropology 144, 146; History 159, 161A, 161B, 162, 163A, 163B, 164, 165, 166A, 166B, 167, 168; Native American Studies 120, 130; Political Science 143; Sociology 158; Spanish 170, 172, 173

3. Middle East: Anthropology 142; History 112A, 112B, 113, 190A, 190B, 190C, 192A, 193A, 193B; Jewish Studies (see an advisor); Middle Eastern Studies [see an advisor]; Religious Studies 162; Women's Studies 184


5. Southeast Asia/Pacific: Anthropology 143A, 143B, 147; Economics 171; History 191 (series), 195B, 196A, 196B; Political Science 148B, 148C; Religious Studies 165, 170, 172

Total Units for the Major ...................... 77-107

Sociology—Organizational Studies

A.B. Degree Requirements:

Preparatory Subject Matter ..................... 29

Sociology 1, 5; or 11; 46A and 468 ........ 21

Depth Subject Matter ......................... 44

Sociology 100 ......................... 4

Sociology 180A ....................... 4

Sociology 106 (or its equivalent) ........ 4

Select from Communication 134, 136, 137, 172; Sociology 126 .......... 8

Select five courses from below, at least three courses from Sociology .............................. 20

Agricultural and Resource Economics 112, 130; American Studies 125; Community and Regional Development 151, 152, 154, 156, 158, 162, 164, 168; Economics 116, 121A, 121B, 151A, 151B, 158, 185B, 194D; Political Science 107, 180, 187; Sociology 103, 124, 138, 139, 141, 154, 159, 160, 180B, 181, 183, 185

Select from Sociology 128, 130, 132, 134, 140, 145A, 145B, 172, 174, 176

One additional elective upper division Sociology course not already used to fulfill other major requirements. May use Sociology 190X, 191, 192/193, 194HA-194HB, 195 ........ 4

Total Units for the Major ...................... 73

Major Advisers. Consult the Departmental Advising office in 1282 Social Sciences and Humanities Building.
**Statistics**

Changes to the Statistics Major Program Requirements; Computational Statistics option

**B.S. Major Requirements:**

Computational Statistics option

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A, 21B, 21C</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics 22A</td>
<td>3</td>
</tr>
<tr>
<td>Computing 30</td>
<td>4</td>
</tr>
<tr>
<td>Any introductory statistics course</td>
<td>3-4</td>
</tr>
</tbody>
</table>

**Depth Subject Matter**

| Statistics 106, 108, 114 | 12   |
| Statistics 131A, 131B     | 8    |
| Two courses from Statistics 104, 135, 137, 138, 142, 144, 145 | 8 |
| Two courses on Scientific Computation | 8 |
| Programming: DB, Management & Data Technologies | 8 |
| Computer Science Engineering 122A, 129, 140A, 158, 163 | 8 |

**Total Units for the Major**

| 82-83 |

Major Adviser. A. Aue

Students are encouraged to meet with an advisor to plan a program as early as possible. At some time before or during the first quarter of the junior year, students planning to major in Statistics should consult with a faculty advisor to plan the remainder of their undergraduate programs.

**Sustainable Agriculture and Food Systems**

Changes to the Sustainable Agriculture and Food Systems Major Program Requirements

**B.S. Major Requirements:**

<table>
<thead>
<tr>
<th>English Composition Requirement</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Courses</td>
<td>24-26</td>
</tr>
<tr>
<td>Plant Sciences 13</td>
<td>4</td>
</tr>
<tr>
<td>Community and Regional Development</td>
<td>4</td>
</tr>
<tr>
<td>Plant Sciences 150</td>
<td>4</td>
</tr>
<tr>
<td>Agricultural and Resource Economics</td>
<td>4</td>
</tr>
<tr>
<td>Plant Sciences 190</td>
<td>2.4</td>
</tr>
<tr>
<td>Environmental Science and Policy 191A, 191B</td>
<td>6</td>
</tr>
</tbody>
</table>

**Internship Requirement**

| 12 |

Students must complete at least 12 units of internship, 8 of which must be completed off campus.

**Applied Production**

| Select 1 course from Plant Sciences 49, Plant Pathology 40, Viticulture and Enology 101A, 101B, 101C, Environmental Horticulture 120, Plant Science 131 | 2.3 |

Select 1 course from Animal Science 49A, Animal Science 49B | 2.3 |

Select 1 course from Applied Biological Systems Technology 49, 52, 101, 142 | 2.3 |

**Track I: Agriculture and Ecology**

Focuses on crop and animal production systems, ecology, and practices that mitigate negative impacts while producing environmental and social benefits.

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 16A, 16B</td>
<td>6</td>
</tr>
<tr>
<td>Plant Sciences 120 or 120</td>
<td>4</td>
</tr>
<tr>
<td>Physics 2A, 28</td>
<td>10</td>
</tr>
<tr>
<td>Biological Sciences 2A, 2B</td>
<td>9</td>
</tr>
<tr>
<td>Plant Sciences 2</td>
<td>4</td>
</tr>
<tr>
<td>Animal Sciences 1 or 2</td>
<td>4</td>
</tr>
<tr>
<td>Food Science 1</td>
<td>3</td>
</tr>
<tr>
<td>Economics 1A</td>
<td>4</td>
</tr>
<tr>
<td>Community and Regional Development</td>
<td>4</td>
</tr>
<tr>
<td>Select 1 course from Philosophy 14, 15, 24</td>
<td>8</td>
</tr>
</tbody>
</table>

Select 1 course from Anthropology 2, Political Science 4, Sociology 1, Sociology 3 | 4.5 |

**Depth Subject Matter**

| Agricultural and Resource Economics 120 or 147 | 4 |
| Environmental Science and Policy 161 | 4.5 |
| Soil Science 100 or Soil Science 109 | 3.4 |
| Select 1 course from Anthropology 2 | 4.5 |
| Environmental Horticulture 160 | 4.5 |
| Evolution and Ecology 101, Plant Sciences 105, 142, Wildlife, Fish, and Conservation Biology 154 | 4.5 |

Additional restricted electives chosen in consultation with an advisor | 20 |

**Track II: Food and Society**

Focuses on issues related to the social, cultural, political and community development aspects of agricultural and food systems.

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philosophy 5 or 31</td>
<td>4</td>
</tr>
<tr>
<td>Select 1 course from Philosophy 14, 15, 24</td>
<td>8</td>
</tr>
<tr>
<td>Sociology 468 or Statistics 13</td>
<td>4</td>
</tr>
<tr>
<td>Select at least 1 course from Community and Regional Development 151, Applied Biological Science and Technology 150, Landscape Architecture 150, Sociology 106, Sociology 107, Sociology 108</td>
<td>3.6</td>
</tr>
<tr>
<td>Chemistry 2A</td>
<td>3</td>
</tr>
<tr>
<td>Biological Sciences 2A or 10</td>
<td>5</td>
</tr>
<tr>
<td>Plant Sciences 20</td>
<td>4</td>
</tr>
<tr>
<td>Select 1 course from Evolution and Ecology 2</td>
<td>4.5</td>
</tr>
<tr>
<td>Biological Sciences 28 or Environmental Science and Policy 1 or 2</td>
<td>3.5</td>
</tr>
<tr>
<td>Food Science 1</td>
<td>3</td>
</tr>
<tr>
<td>Soil Science 10</td>
<td>3</td>
</tr>
<tr>
<td>Economics 1A</td>
<td>4</td>
</tr>
<tr>
<td>Political Science 4</td>
<td>4</td>
</tr>
<tr>
<td>Select 1 course from Anthropology 2</td>
<td>4.5</td>
</tr>
<tr>
<td>Sociology 1, Sociology 3</td>
<td>4.5</td>
</tr>
<tr>
<td>Community and Regional Development</td>
<td>2.2</td>
</tr>
</tbody>
</table>

**Depth Subject Matter**

| Agricultural and Resource Economics 112 or 150 | 4 |
| Select 1 course from Agricultural and Resource Economics 147, 176, Environmental Science and Policy 160, 161, 169, 172, 179 | 3.4 |
| Choose 12 units from Anthropology 101, 102, Community and Regional Development 142, Sociology 139, 144, 145A, 145B | 12 |

**Wildlife, Fish, and Conservation Biology**

Changes to the Wildlife, Fish, and Conservation Biology Major Program Requirements

**B.S. Major Requirements:**

<table>
<thead>
<tr>
<th>Written/Oral Expression</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Writing Program</td>
<td>4</td>
</tr>
<tr>
<td>Communication I</td>
<td>4</td>
</tr>
<tr>
<td>Above requirements simultaneously satisfy the College requirements.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences 1A, 2A, 2B, 2C</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry 1A, 1B, 2A, 2B, 2C</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics 16A, 16B</td>
<td>6</td>
</tr>
<tr>
<td>Physics 1A, 1B</td>
<td>6</td>
</tr>
<tr>
<td>Statistics 100, 102, or Plant Sciences 120</td>
<td>4</td>
</tr>
<tr>
<td>Wildlife, Fish, and Conservation Biology</td>
<td>3.4</td>
</tr>
</tbody>
</table>

**Depth Subject Matter**

| Wildlife, Fish, and Conservation Biology | 47-54 |
| Wildlife, Fish, and Conservation Biology | 11, 50 |
Wildlife, Fish, and Conservation Biology 121 or 130 ..........................4
Neurobiology, Physiology, and Behavior 102 or Wildlife, Fish, and Conservation Biology 141 ..........................4
Wildlife, Fish, and Conservation Biology 122 ..........................4
Wildlife, Fish, and Conservation Biology 154 ..........................4
Choose three lecture courses and two [laboratory] courses from Wildlife, Fish, and Conservation Biology 110, 110L, 111, 111L, 120, 120L, or Evolution and Ecology 134, 134L. 12-15
Choose one course (two recommended) from Statistics 104, 106, or 108 ..........................4
Wildlife, Fish, and Conservation Biology 100, or 101 & 101L, or 102 & 102L ..........................4-7
Strongly recommended, but not required
Landscape Architecture 150 ..........................3
Strongly recommended, but not required
Anatomy, Physiology, and Cell Biology 100 ..........................4

Restricted Electives .......................... 15-24

Choose one from the five Areas of Specialization shown below. Students must maintain a C average (2.000 GPA) and pass all course work in their chosen specialization.

Areas of Specialization

(1) Conservation Biology: Complete Wildlife, Fish, and Conservation Biology 155 & 155L.
Choose one course from Environmental Science and Policy 161, 170, or 171.
Choose one course from Animal Science 103, Nature and Culture 120, 140, or Veterinary Medicine 170.
(2) Fish Biology: Complete Wildlife, Fish, and Conservation Biology 120 & 120L.
Choose one course from Entomology 116 or Evolution and Ecology 112 & 112L.
Choose one course from Hydrology 150, Environmental Science and Policy 161, 169, or Landscape Architecture 150.
(3) Wildlife Biology: Complete Wildlife, Fish, and Conservation Biology 151.
Choose one course from Plant Biology 102, Plant Sciences 144, 147 & 147L or 178.
Choose one course from Environmental Horticulture 160, Environmental Science and Policy 155, Plant Sciences 130, Wildlife, Fish, and Conservation Biology 155 & 155L, 156, or 157.
Choose two courses from Animal Science 104, Environmental Science and Policy 121, Environmental Toxicology 101, Evolution and Ecology 107, Landscape Architecture 150, Medical Microbiology 116, Wildlife, Fish, and Conservation Biology 136, 141 [cannot be used to simultaneously satisfy the Depth Subject Matter requirement], or 152.
Note: Students interested in certification as a Wildlife Biologist from The Wildlife Society should consider additional courses in plant sciences. Recommended courses include Plant Biology 108, 117, 118, 119, 148, Plant Sciences 131, 144, 145, or 178.
(4) Wildlife Health: Complete either Biological Sciences 102 and 103 or Animal Biology 102 and 103.
Choose one course from Wildlife, Fish, and Conservation Biology 136, 151, 152, or 155 & 155L.
Choose one course from Animal Science 103 or 170.
Choose one course from Anatomy, Physiology, and Cell Biology 100, Animal Science 104, Medical Microbiology 115, 116, Microbiology 102, Molecular and Cell Biology 150, Neurobiology, Physiology, and Behavior 101, 126, 127, 128, 140, or Veterinary Medicine and Epidemiology 158. Note that this AOS recommends additional preparatory courses; prerequisites for admission to Veterinary Medicine vary among schools and students should confirm the specific requirements of the school(s) to which they wish to apply. Additional Preparatory courses, recommended, not required: Chemistry 2C, 118A, 118B, 118C, Physics 7A, 7B, 7C.
(5) Individualized: Students may, with prior approval of their adviser and the curriculum committee, design their own individualized specialization within the major. The specialization will consist of five upper division courses with a common theme.

Total Units for the Degree .......................... 119-136

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2013-2014 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Domestic Diversity; Wrt=Writing Experience
Fall 2011 and on General Education (GE): Art=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; ACGH=American Cultures; DD=Domestic Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; VL=Visual; WC=World Cultures; WE=Writing Experience