



CALIFORNIA STATE UNIVERSITY
FULLERTON[™]

Sustainability Course List
(2016-2018)

This course list is produced by the
Sustainability Tracking & Assessment Rating System (STARS) Committee
comprised of university students, faculty, staff.

Executive Summary

California State University, Fullerton is a signatory of the Talloires Declaration and the American Colleges and Universities Presidents' Climate Commitment as of spring 2011. The university completed the first campus-wide sustainability assessment achieving a STARS silver rating. It has been the commitment of this university to be sustainable in practice and educate sustainable behaviors and concepts to its students. As a regional leader in sustainability and in education, this collection of sustainability courses and courses that include sustainability components demonstrates and supports those set commitments for the institution and to its students.

As stated in the Talloires Declaration:

-) **Increase Awareness of Environmentally Sustainable Development:** Use every opportunity to raise public, government, industry, foundation, and university awareness by openly addressing the urgent need to move toward an environmentally sustainable future.
-) **Create an Institutional Culture of Sustainability:** Encourage all universities to engage in education, research, policy formation, and information exchange on population, environment, and development to move toward global sustainability.
-) **Educate for Environmentally Responsible Citizenship:** Establish programs to produce expertise in environmental management, sustainable economic development, population, and related fields to ensure that all university graduates are environmentally literate and have the awareness and understanding to be ecologically responsible citizens.
-) **Foster Environmental Literacy for All:** Create programs to develop the capability of university faculty to teach environmental literacy to all undergraduate, graduate, and professional students.

- i) **Practice Institutional Ecology:** Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.
- ii) **Involve All Stakeholders:** Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development. Expand work with community and nongovernmental organizations to assist in finding solutions to environmental problems.
- iii) **Collaborate for Interdisciplinary Approaches:** Convene university faculty and administrators with environmental practitioners to develop interdisciplinary approaches to curricula, research initiatives, operations, and outreach activities that support an environmentally sustainable future.
- iv) **Enhance Capacity of Primary and Secondary Schools:** Establish partnerships with primary and secondary schools to help develop the capacity for interdisciplinary teaching about population, environment, and sustainable development.
- v) **Broaden Service and Outreach Nationally and Internationally:** Work with national and international organizations to promote a worldwide university effort toward a sustainable future.
- vi) **Maintain the Movement:** Establish a Secretariat and a steering committee to continue this momentum, and to inform and support each other's efforts in carrying out this declaration.

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Sustainability Courses

Sustainability courses: Undergraduate			
Dept	Course ID	Course Title	Course Description
ANTH	458	Sustainable Urban Food Systems	Develops students' skills and knowledge in the natural, social, and economic environment. Students will learn an integrated approach to understanding urban ecosystems and food security through sustainable urban agriculture.
BIOL	330	Sustainability Ecology: American Indian Models	Interrelationships of Native peoples of the Americas with the local flora and fauna and the natural environment. Roles of American Indians in predator-prey interactions, ecological hierarchy, nutrient cycling, successional change and resource management. No credit toward biological science major.
CHEM	492	Sustainability Projects	Interdisciplinary teams work on real world problems related to sustainability on campus or in the community.

ENST	492	Sustainability Projects	Interdisciplinary teams work on real world problems related to sustainability on campus or in the community.
PHYS	301	Energy & Sustainability	Basic physical principles applied to the generation and use of energy. Conventional and alternative energy sources. Environmental consequences of energy use, greenhouse effect, global warming. Energy conservation principles. One or more sections offered online.

Total: 5

Sustainability courses: Graduate

Dept	Course ID	Course Title	Course Description
EGCE	575	Data Mining in Sustainability	Expert systems and artificial intelligence techniques in construction engineering; expert systems for: safety evaluation of structures during construction, site selection, construction decision making, and construction schedule analysis; project monitoring; claims and disputes.
EGCE	515	Solid Waste Management, System Design and Sustainability	Industrial waste treatment and disposal, waste minimization, process selection, control, green technologies and resource recovery. Design of liners, gas and leachate collection and removal systems in landfills.

Total: 2

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Sustainability-Included Courses

Courses that include Sustainability: Undergraduate			
Dept	Course ID	Course Title	Course Description
AMST	449	American West	Meaning of the West to American culture through analysis of cultural documents, such as explorer and captivity narratives, fiction, art and film. Perception of wilderness, Indians, frontiersmen and role of the West in creating a sexist national mythology.
AMST	444	The Built Environment	How Americans have shaped and structured space from the 17th century to the present. Relationship between space, place, architecture and material culture; the interpretation of cultural landscapes and architectural styles; the changing meanings of the American home.
AMST	423	Search for Community	Historical transformation and modern reformulation of community in America. Relationship of the individual to the larger social group. Freedom, need to belong, alienation and search for identity.

AMST	416	Southern California Culture	Regionalism as a concept and as a fact of American life. Theories of regionalism measured against a study of Southern California and one other distinct American region.
AMST	404	Americans and Nature	Examines shifting attitudes toward the natural environment among a range of Americans over time, from native inhabitants and early colonists to rural and urban dwellers today. Topics include agrarian expansion, industrialization, transcendentalism, tourism, humans' roles in "natural" disasters and the history of environmental activism.
AMST	395	California Cultures	How various cultures - Native American, European, Latino, Asian, African- American - have interacted in California's past and present. Cultural diversity in frontiers and borderlands; shifting meanings of gender; function of regional and racial myths.
AMST	401T	American Culture & Nature	Relationship between theory and application. Analytic readings and research. Check the class schedule for topics being considered. May be repeated for credit.

ANTH	454	Primate Conservation	Uses behavioral ecology and life history theory to understand issues surrounding conservation of non-human primates. Develop theoretical background crucial to understanding the population dynamics and ecological principles driving primate conservation strategies.
ANTH	442	Medical Anthropology	Human health and disease and their relationship to cultural practices, beliefs and environmental factors; histories of various diseases as factors of cultural change; health care delivery systems. One or more sections offered online.
ANTH	315	Culture and Nutrition	Interrelationships among human nutrition, basic food resources, individual development and socio-cultural organization; assessment of student's nutritional status, beliefs and practices relative to other cultures.
ANTH	310	Urban Anthropology	Cross-cultural investigation of similarities and differences in urbanism with an emphasis on current theoretical and methodological perspectives in the study of urban social and cultural forms and processes.

ANTH	301	Primate Behavior	Anthropological study of the behavior of primates, including monkeys and apes with data collection in the wild and the laboratory; review and discussion of behavioral characteristics that are part of the primate heritage of humankind.
ANTH/BIOL	322	Human Behavioral Ecology	Using modern evolutionary theory, students will examine human biological and cultural diversity through an analysis of comparative socioecology. Topics covered include reproduction and marriage, the family, childhood, population growth, and conservation. Computer labs utilizing eHRAF.
ART	337	Animal and Wildlife Drawing	Principles and practices of drawing animals, including construction, anatomy, texture, movement and expression. Fundamentals, historical information and critiques are covered in the classroom; field studies are conducted at various zoos and wildlife habitats.
ART	483E	Computer Assisted Graphics	Theory and practice of design using the computer. Numerous applications of the computer through lecture demonstration, studio/laboratory experience, guest speakers and field trips. Maximum of 12 units for credit (repeatable as upper-division electives), but no more than 3 units in a single semester without permission of instructors.

ART	323B	Graphic Design	Development and projection of ideas in relation to the technical, aesthetic and psychological aspects of advertising art. Intermediate use of computer graphics.
ASAM	342	Asian Pacific American Families	Asian Pacific American families have ranged from the seemingly solitary “bachelor” to the extended “clan.” Explores these, and many other ways of being a “family,” as it has been a basic part of Asian Pacific American history and culture.
ASAM	300	Introduction to Asian Pacific American Studies	Interdisciplinary exploration of the experiences of several Asian American groups. Addresses questions of cultural assimilation and cultural persistence, family and gender roles, and literary and popular culture representations.
ASAM	362A	Filipina/o American Experience	Introduction to Filipina/o American Studies, covering point of origin, immigration, legal barriers, economic struggles, civil rights and other current issues up to 1965.

BIOL	481	Advances in Evolution & Ecology	Current topics in evolutionary biology and ecology. Examination and analysis of current literature relating to evolutionary biology, population, community, and ecosystem ecology, behavioral ecology and evolutionary ecology.
BIOL	478	Mammology	Systematics, evolution, morphology, physiology, ecology and behavior of mammals.
BIOL	474	Natural History of Vertebrates	Natural history of the vertebrates. Observation, identification, behavior, ecology and distribution of the vertebrates.
BIOL	466	Behavioral Ecology	Current problems in the evolution of animal behavior; the origin and maintenance of social systems and behavioral interactions of animals.

BIOL	450	Conservation Biology	Current topics involving theory, concepts and techniques in the conservation of biological diversity.
BIOL	449	Desert Ecology	Adaptations, distributions and interactions of desert plants, animals and microbes, including the influences of environmental factors
BIOL	448	Plant Molecular Biology	Genetic mechanisms in vascular plants controlling metabolism, growth, development, and responses to biotic/abiotic environmental stresses. Molecular regulation of gene expression and transduction of internal and external signals.
BIOL	447	Ethnobotany	How people interact with plants and the environment, including such things as western medicinal plant use, traditional medicine and dentistry, exotic foods and conservation.

BIOL	444	Plant Physiology	Fundamental mechanisms of plant physiological responses to the environment with primary emphasis on whole plants and ecosystems.
BIOL	443	Plant Ecology	Community and population ecology of terrestrial plants. Environmental factors and plant distribution with emphasis on California vegetation.
BIOL	442	Pollination Biology	Pollination in the plant kingdom. Floral cues, pollination syndromes, pollinator behavior, chemical and physical characteristics of pollination, energetics, gene flow, phenology, and ecological aspects of pollination.
BIOL	441	Plant Taxonomy	Classification and evolution of vascular plants; emphasis on the flowering plants.

BIOL	438	Public Health Microbiology	Control and epidemiology of infectious diseases of public health importance, water and sewage microbiology. Control of current problems.
BIOL	419	Marine Ecology	Ecology of planktonic, nektonic and benthic organisms; their communities and environments.
BIOL	412	Principles of Gene Manipulation	Current approaches to and applications of recombinant DNA technology. Principles behind construction of recombinant molecules including vectors and enzymes, introduction into organisms, selection, expression of cloned genes, and impact of research on society.
BIOL	401	Biogeography	Evolutionary patterns and mechanisms of the distribution of plants and animals in the major habitats of the world. Current concepts and theories.

BIOL	352	Plants and Life	Importance of plants in our lives, including such things as plant domestication and the origin of agriculture. Why plants are fascinating organisms. No credit toward biological science major.
BIOL	344	Survey of the Land Plants	Anatomical and morphological characteristics of the land plants as they relate to the evolutionary development and ecological strategies of these plants.
BIOL	319	Marine Biology	Survey of marine plants and animals in their habitats. No credit toward biological science major.
BIOL	318	Wildlife Conservation	Causes and consequences of loss of biological diversity, with an emphasis on wildlife populations and science-based conservation. Threatened and endangered species/ecosystems, ecosystem management, habitat restoration, captive species reintroductions and conservation legislation. No credit toward biological science major.

BIOL	317	Field Marine Biology	Field biology and natural history of local marine plants and animals. Identification of common species and factors determining their distributions and abundance in marine habitats. Effects of human activities on marine organisms.
BIOL	314	Population and Community Ecology	Introduction to the quantitative description of populations and communities, as well as the use of mathematical models to understand the dynamics of populations and communities. Links comparative, experimental and theoretical approaches to understanding the abundance and distribution of organisms and their interactions.
BIOL	301	Problems in Environmental Biology	Environmental problems in Southern California ecosystems. Effects of human activities on desert, foothill, and wetland ecosystems. Offered as an intensive four-week summer field experience.
BIOL	300	Environmental Biology	Biological consequences of human intervention in ecosystems: Endangered and threatened species, pollution impact on organisms, pest control, population dynamics, genetic engineering of agricultural species, management of natural areas and urban ecosystem dynamics. No credit toward biological science major.

BIOL	274	Principles of Physiology and Ecology	Principles of organisms' interactions with their environments; physiological and evolutionary mechanisms of change in response to environmental factors; population and community ecology; energy and material flow through ecosystems.
BIOL	171	Evolution & Biodiversity	Introduction to scientific processes and methods of biology. Unifying principles of evolution processes leading to biodiversity, and principles of conservation biology
BIOL	102	Biology for Future teachers	Designed especially for the prospective teacher, this activity-based course examines biological concepts in real-world contexts, such as the medical examination, genes and evolution, and the environment. Lecture and laboratory form a single unified learning experience
BIOL	101	Elements of Biology	Underlying principles governing life forms, processes and interactions. Elements of biology and reasoning skills for understanding scientific issues on personal, societal and global levels. For the non-science major.

BIOL	101L	Elements of Biology Laboratory	Laboratory experiments demonstrating the principles presented in the lecture course. Scientific inquiry, cell structure and function, physiology, genetics, biodiversity, evolution and ecology. For the non-science major.
BIOL	446	Marine Phycology	Biological aspects of marine algae; comparative development, morphology, taxonomy, physiology, and ecology.
CHEM	438	Environmental Biochemistry	Effects of current agricultural, industrial and mechanical practices on the composition, metabolism and health of soil, plants, animals and man, from a biochemical perspective; mechanism of action and degradation of common agricultural chemicals and industrial pollutants.
CHEM	437	Environmental Water Chemistry	Chemical characteristics of fresh and oceanic water; major water pollutant classes, origins, environmental chemical transformations, effects, abatement, and fates; chemical methods for determining water quality, large scale processes for water treatment.

CHEM	436	Atmospheric Chemistry	Chemistry and photochemistry of the troposphere and stratosphere, both natural and polluted. Fundamental reaction kinetics and mechanisms, monitoring techniques, smog chamber, field and modeling studies
CHEM	435	Chemistry of Hazardous Materials	Hazardous chemicals; organic and inorganic air- and moisture-sensitive compounds, reactive metals; chemical reactivity patterns; chemical compatibilities; storage and handling; methods of disposal and waste containment; Federal and local regulations; case histories.
CHEM	102	Physical Science for Future Elementary Teachers	Designed especially for the prospective elementary teacher, this activity-based course examines physical science concepts in real-world contexts such as global warming, kitchen science and the automobile. Lecture and laboratory is combined into a single unified learning experience.
CHEM	100	Survey of Chemistry	Fundamental principles of chemistry; atomic and molecular structure and the application of these principles to contemporary problems. For non-science majors.

CHEM	411G	Mass Spectrometry	Conventional magnetic sector, quadruple, Fourier transform, tandem, and time-of-flight; hyphenated techniques including gas chromatography (GC-MS), liquid chromatography (LC-MS). Students wishing an ACS certified degree must take three units of CHEM 411 courses.
CHEM	411C	Separations	High performance liquid chromatography, gas chromatography. Students wishing an ACS certified degree must take three units of CHEM 411 courses.
CHEM	411A	Optical Spectroscopy	UV/visible, infrared, atomic absorption, flame emission. Students wishing an ACS certified degree must take three units of CHEM 411 courses.
CHEM	313 A/B/C	Environmental Pollution and Its Solutions: Air/Water/Land	Human pollution of the Earth's atmosphere and means to ameliorate this pollution. Historical examples, current cases and future prospects.

CHEM	303C	Biotechnology: Agricultural & Environmental Biotechnology	Major applications of modern biotechnology will be explored in a lecture/discussion/presentation format that includes guest speakers from industry.
CHEM	301B	Organic Chemistry	Properties and reactions of aliphatic and aromatic compounds, theories of structure, and reaction mechanisms. For non-chemistry majors, or B.A. in Chemistry, B.S. in Chemistry or B.S. in Biochemistry majors.
CHEM	301A	Organic Chemistry	Properties and reactions of aliphatic and aromatic compounds, theories of structure, and reaction mechanisms. For non-chemistry majors, or B.A. in Chemistry, B.S. in Chemistry or B.S. in Biochemistry majors.
CHIC	303	Chicano/ Mexican Cultures	Methodology for studying and analyzing the cultural background of Mexican and Chicana/o populations in order to understand current traditions, practices, beliefs and ideologies. Issues, such as syncretism, colonialism, modernization, urbanization, migration and resistance.

COMM	464	Public Relations Management	Analyze systems and strategies for planning public relations campaigns and solving/preventing problems. Individual, team case studies, in corporate development of proposals; actual use of tools in addition to role playing presentations to management.
COMM	447	Tourism and Travel	Concepts, tools and techniques necessary for understanding the tourism and travel industry and its promotional communications. Trends and issues of tourism and travel and the unique problems and opportunities of this field.
ECON	462	Natural Resources Economics	Concepts and principles in the application of economics to issues in natural resource economics. Issues include uncertainty and risk in investment, depletion over time, cartelization, the role of technological innovation and government intervention related to fuels, water, land, etc.
ECON	461	Benefit Cost and Microeconomic Policy Analysis	Application of economic concepts and methods to understanding the ways in which human economic behavior contributes to environmental and ecosystem degradation; the use of economic approaches to evaluate and manage these impacts; the design of sustainable economic policies.

ECON	415	Economics of Health	Application of economic reasoning to the analyses of health-related issues, markets, practice, education, research, and policy within social and political contexts.
ECON	411	International Trade	Theories of international trade. Gains from trade, effects of tariff and non-tariff barriers, and conduct of commercial policy. Balance of payments, theories of exchange rate determination and other international economic issues.
ECON	362	Environmental Economics	Economic analysis of environmental problems and related issues: externalities, property rights, social costs and benefits, user cost, rent and decision making under uncertainty.
ECON	336	Economies of the Middle East	Economic circumstances and challenges in the Middle East. Topics include population and education, dependence on oil exports, state control of the economy, and the potential for economic growth and stability in the region.

ECON	335	The International Economy	Theory, practice and institutions of the international economy. International trade and investment, balance of payments, foreign exchange rates, multinational enterprise, international economic policy. Current trade issues: European Community, trade with developing countries, Eastern Europe, and the states of the former Soviet Union; General Agreement on Tariffs and Trade (GATT) and other major trade agreements.
ECON	333	Economic Development: Analysis and Case Studies	Processes of economic growth with references to developing areas. Capital formation, resource allocation, relation to the world economy, economic planning and institutional factors, with case studies.
EGCE	482	Wastewater Treatment and Water Reclamation	Principles of anoxic, aerobic and anaerobic biological processes and treatment. Stepwise development and process design equipment selection, economic evaluation, green technologies and operating guidelines for wastewater treatment.
EGCE	481	Remediation of Contaminated Soil and Groundwater	Site assessment, green technologies, design for soil remediation systems and design for groundwater remediation systems.

EGCE	466	Public Transit System & Planning	Urban passenger transportation modes, paratransit, special modes, vehicles characteristics and motion, highway transit mode, rail transit mode, new concepts, transit system performance (capacity, productivity, efficiency and utilization, organization and financing).
EGCE	441	Environmental Engineering	Planning and controlling the environment; wastewater treatment and disposal; solid waste management; air pollution; radiation protection; housing and residential environment.
EGCE	436	Engineering Hydrology	Hydrologic cycle with applications to hydrologic design of engineering structures. Rainfall, stream flow, ground water, surface runoff, hydrographs, flood routing, frequency distributions and design hydrographs.
EGME	480	Human Factors in Engineering	Principles of design for making products and systems faster, easier and more effective to use. Design project using these principles that consider human capabilities and limitation of senses and responses to sensory stimuli. Physiological, psychological and work factors are evaluated for design of equipment, work methods, environments and standards.

EGME	475	Acoustics and Noise Control	Basic phenomena on the propagation, absorption and generation of acoustic waves, specification and measurement of noise, effects of noise on speech and behavior, legal aspects of industrial and building noise, principles and application of noise control.
EGME	461	Fabrication Methods	Manufacturing processes. Metal joining processes. Casting, forging, powder metallurgy, machining and machining tools, finishing, coating, plating, non-metallic materials inspection and gauging and tolerances.
EGME	460	Failure of Engineering Materials	Imperfections in solids; fracture initiation and crack propagation; dislocations; yield point phenomenon; fatigue; creep; ultrasonic effects; radiation damage; stress corrosion; hydrogen embrittlement; failure of composite materials.
EGME	459	Plastics and other Non-Metallics	Simplified chemistry of plastics. Applications. Manufacturing processes. Methods for preventing deterioration of nonmetallic materials. Composites. Ceramics. Refractories. Wood. Destructive and nondestructive testing of nonmetallic materials.

EGME	421	Mechanical Design	Design and application of machine components such as brakes, clutches, gears, springs, fasteners, pulleys and belting lubrication of machine elements, bearings, gaskets, seals, "O" rings, methods for study of impact, dynamic loading and fatigue; comprehensive treatment of failure, safety and reliability.
EGME	419	Design Project II	Construction of prototype, model or components. Test proposed design, and prepare a written final design report. Teamwork and communications skills are emphasized. Interim and final oral presentations are required.
EGME	414	Design Project I	Design methodology, CAD/CAE philosophy, optimization, product liability, probability/statistical principles, ASME codes, safety, human factors, material selection, legal aspects of design, professional ethics. Design project to be constructed in EGME 419, but feasibility study, preliminary design, assembly drawings, interim and final written project reports, interim and final oral presentations are required for EGME 414.
EGME	331	Mechanical Behavior of Materials	Engineering properties of materials. Toughness and fatigue. Creep phenomena. Corrosion. Energy concepts. Beams and columns. Torsion. Combined stresses. Pressure vessels. Failure theories. Design of machine elements.

ENGL	429	American Landscape in Literature	Literary perception of our environment, with special attention to what perceptions of the landscape reveal about human nature.
ENGL	360	Scientific and Technical Writing	Open to science and non-science students. Advanced composition stressing professional rhetorical situations, genres and styles. Professional writing, designing and editing, with attention to outlines and abstracts, description, process explanation, instructions and fundamentals of reports, feasibility studies, proposals, internal memos and letters.
ENGL	326	The American Frontier in Literature	Thematic study of American literature as it reflects the changing frontier experience and establishes national myths and symbols.
FIN	454	Real Estate/Market Analysis	Factors and influences of urban growth and development. Economic factors and real estate supply and demand. Location theory and urban growth patterns. Public policy as a factor in real estate development. Analysis of real estate markets.

GEOG	488	Land Use Analysis	Urban and rural land use and settlement; geographic field problems. Application of geographic techniques and tools to local field studies.
GEOG	486	Environmental Remote Sensing	Fundamentals of remote sensing science and digital image processing. Remote sensing principles and the processing and interpretation of remotely sensed data using image processing techniques and software.
GEOG	485	GIS Applications	Integrated computer-assisted methods for handling spatial data, including database design, data conversion and updating, information retrieval, analysis, modeling and mapping.
GEOG	484	Urban Planning Methods	Seminar and Practicum on methods in urban planning. Analytical techniques and basic data sources. Population forecasting, housing surveys, economic development, fiscal impacts and area revitalization. Individual and team projects.

GEOG	483	Mountain Field Geography	Summer field study of the physical and environmental geography of mountain systems in the West. Alpine/subalpine glacial action, weather and climate, biogeography, soils, human impacts and sustainability.
GEOG	482	Environmental Impact Assessment	Techniques relevant to environmental impact assessment in accord with CEQA (state) and NEPA (federal) regulations. Systematic evaluation of major environmental impact topics. Individual and small team activities.
GEOG	481	Geographic Information Systems: Introduction	Methods and applications of computer-assisted mapping and geographic information systems
GEOG	478	Urban Planning Principles	Seminar/discussion on conceptual themes and legal foundations of American urban planning. Policy areas associated with urbanization and suburbanization processes: land use, economic development, redevelopment, housing systems, neighborhood dynamics and growth management.

GEOG	475	Interpretation of Urban Landscape	Geographic view of the city as a landscape composite of structure, space, place and experience. Emphasizes the European and North American city
GEOG	452	Ecotourism	Evolution and distribution of nature-based tourism. Role of ecotourism in regional development and environmental conservation. Sociocultural impacts in less developed countries.
GEOG	450	Human Response to Environmental Hazards	Issues involved as humans endeavor to minimize the impacts of hazards in the environment. Importance of cognition, perception, communication, mitigation and preparedness as societies cope with hazards posed by the natural world and human action.
GEOG	426	The Coastal Environment	An overview of coastal geomorphology, climatology, and plant geography with an emphasis on Southern California. Human interaction, modification, and management of those systems.

GEOG	425	Tropical Rainforests	Discussion/ seminar examining the geography, ecology and human use of tropical rainforests. Causes and consequences of deforestation, sustainable development and preservation.
GEOG	424	Desert Landscapes	Desert landscapes, including climate, geomorphology, vegetation, natural history, settlement and unique urban planning challenges. The desert as “place” in geographic literature. Focuses on North American deserts. A field trip is required.
GEOG	422	Global Climate Change	Physical factors that produce climatic patterns and regional impacts of climate change.
GEOG	370	Cities and Suburbs	American metropolitan systems and city-region linkages. Theories and spatial models of social and economic patterns within cities and suburbs; planning implications of these locational patterns.

GEOG	352	The National Parks	The park system and its evolution as related to conservation, preservation and recreational land use. Cultural heritage and physical environment.
GEOG	350	Nature and Society	Interface between human systems and natural systems. Factors affecting human interaction with the earth, including environmental ethics, public policy and technology.
GEOG	330	California	Landscapes of California, their environmental characteristics, development patterns and current problems.
GEOG	329	Cities and Nature	Overview of the impact of urbanization on landforms, climate, vegetation, and animals. Planning implications and case studies.

GEOG	328	Global Change and Environmental Systems	Introduction to the Earth's environment in the context of global change. Interdisciplinary discussion of the nature, causes and consequences of the natural and human aspects of global environmental change.
GEOG	325	Natural Vegetation	Geography of the globe's natural vegetation associations. Role of plate tectonics, climate, soils, fire and humans as agents of landscape-level vegetation change.
GEOG	323	Weather & Climate	Atmospheric elements and controls, fronts, severe weather and climatic classification systems.
GEOG	120	Global Environmental Problems	Geographical analysis of the Earth's principal environmental problems. Subjects include population growth, agriculture and pesticides, climate change, forestry and fishing, energy, endangered species and appropriate development.

GEOG	110	Intro to Natural Environment	Introduction to the major components of the physical environment, including landforms, climate, natural vegetation and soils.
GEOL	470	Environmental Geology & Planning	Geologic processes, hazards, mineral and energy resources and their interaction with planning and environmental regulations.
GEOL	436	Hydrogeology	Occurrence, movement and utilization of groundwater resources; geological, geophysical and hydrological methods for groundwater exploration and development. Well hydraulics and ground-water contamination.
GEOL	420	Earth Science for Science Teachers	Major concepts of the earth sciences with primary emphasis on physical and planetary geology and secondary emphasis on meteorology and oceanography.

GEOL	406	Geochemistry	Basic chemical and thermodynamic principles applied to the origin and alteration of igneous, metamorphic and sedimentary rocks
GEOL	140	Earth's Atmosphere & Oceans	Composition, structure and circulation of the Earth's atmosphere and oceans with a general focus on their interactions. Interdisciplinary topics that highlight atmosphere-ocean interactions will include global warming, ice ages, El Niño, Southern California storm activity and Santa Ana winds.
GEOL	101	Physical Geology	Physical nature of the planet Earth, genesis of rocks and minerals, erosion processes and their effects.
GEOL	310T	Topics in California-Related Geology	Directed investigations of one aspect of Earth science. Alternating topics are California geology, earthquakes, California geologic hazards, national parks geology, Earth's environmental crisis and California's water crisis.

GEOL	481C	Watershed Hydrology Field Camp	Geologic mapping and hydrologic mapping and techniques applied to integrated hydrogeologic model for selected areas. Field report(s), map(s), cross-sections required.
HESC	481	Globalization & Health	Health effects of globalization. Health concerns arising from political, economic and social interconnectedness and the need to find common solutions to ensure human health worldwide.
HESC	475	Health Science Planning, Research	Identification and application of concepts related to Health Science planning, research and evaluation. Analysis of planning and research designs applicable to health professionals, as well as tools for measurement of health status at individual, community, national level
HESC	465	Intro to International Health	Issues in international health, emphasizing core disease conditions. Leading causes of death and disability within an international context, as well as programmatic and policy responses to improve international health.

HESC	463	Air Pollution & Health	Health effects of air pollutants on local, regional and global scales. Health effects of urban smog, particulate matter, indoor, outdoor and occupational exposures. Health implications from global warming, ozone-depletion and acid rain.
HESC	462	Environmental Toxicology & Health	Fundamental toxicological concepts, including absorption, distribution, storage, biotransformation and elimination of toxicants, target organ toxicity and risk assessment. Toxicological effects of environmental agents such as pesticides, industrial chemicals, household chemicals and food contaminants.
HESC	461	Occupational Health & Safety	Occupational health principles, including anticipation, recognition, evaluation and control of occupational hazards are presented to heighten awareness of workplace hazards on human health. Occupational health laws, regulations and methods of compliance.
HESC	460	Worksite Health Promotion	Philosophy, rationale and guidelines for developing health promotion programs in the corporate setting. Unique considerations in assessing needs, planning and implementing programs, evaluating effectiveness and coordinating activities in the workplace are discussed.

HESC	440	Determinants of Health Behavior	Contemporary research on the health effect of human behavior. Introduction to theoretical foundations and practical applications of behavior in the context of health: physical, psychological, cultural and social health. Current issues and theories of health behavior.
HESC	416	Global Issues in Environmental Health	Environmental factors such as air pollution, population dynamics, urbanization and energy production that influence human and ecological health on the global scale. Methods of control to prevent diseases from environmental agents.
HESC	415	Environmental Health	Overview of environmental concerns as they relate to human health. How environmental factors are involved in the transmission and prevention of diseases and health hazards resulting from exposures.
HESC	401	Epidemiology	Application of epidemiologic procedures to the understanding of the occurrence and control of infectious and chronic diseases, mental illness, environmental health hazards, accidents and geriatric problems.

HESC	400	Program Design	Provides skills necessary for developing, implementing and evaluating human movement and/or health promotion programs for specific target populations.
HESC	301	Promotion of Optimal Health	Advanced health concepts and practices. Common health problems, causative factors and methods for prevention. Preventive and promotive health concepts and practices; integrating physiological, psychosocial, spiritual, cultural and environmental factors that inhibit or facilitate optimal health. Elective for nursing majors.
HESC	115	Introduction to Environmental Health and Safety	How environmental and safety hazards influence public health and sustainability. Multiple perspectives on water, air, and solid waste pollutions, sustainability and public safety issues.
HESC	101	Personal Health	Basic concepts relating to health and well-being from a holistic perspective. Mental, emotional, physical and socio-environmental dimensions of health, sexuality and relationships; nutrition and physical fitness; use and abuse of drugs; health care services and current health problems.

HIST	494	Oral History Edit/Indexing	Techniques of editing, book and photo layout and indexing. Focuses on oral history documents, but includes other historical and technical editing.
HIST	493	Oral History	Utilization of tape recorded interviews to document significant events in 20th-century history. Training in interviewing techniques, specific background research and equipment use, after which students conduct a number of tape-recorded interviews.
HIST	492	Community History	Historical development of communities in general, including the Orange County area. Techniques of gathering and processing local historical data, including oral interviews and other archival materials.
HIST	479	Urbanization of American Life	Urban life in America; the colonial town, the western town and the industrial city.

LBST	488	Senior Seminar in Environmental Studies	Interdisciplinary seminar involving the examination and analysis of environmental problems from the perspectives of the natural sciences and the social sciences. Students participate in class discussions and write papers on environmental topics.
LBST	310	The California Experience	Seven themes in California studies. Explores the California experience through readings, films and music, and three writing assignments that research one topic each in the arts/humanities, social sciences and natural sciences in California.
MATH	470	Advanced Mathematical Model Building	A capstone course for students with strong mathematical preparation. Topics may include stochastic models, Monte Carlo integration, simulation of discrete event systems, simulation software and further studies in dynamic systems and flow and diffusion models.
MATH	440	Advanced Numerical Analysis	Advanced topics in numerical analysis selected from iterative methods for linear systems, approximation of eigenvalues and eigenvectors, numerical methods for ordinary and partial differential equations, optimization methods and approximation theory. Error and convergence analysis and computer coding.

MATH	438	Introduction to Stochastic Processes	Stochastic processes, including Markov chains, Poisson Process, Wiener Process. Applications to birth and death processes and queuing theory.
MATH	435	Mathematical Statistics	Statistical theory and its applications, based on the use of calculus.
MATH	414	Topology	Topological spaces and continuous functions, connectedness and compactness, metric spaces and function spaces.
MGMT	440	Emerging Issues in Management	Business and management in America. Interrelationships of technological, economic, political and social forces with the business enterprises and their ethical obligations to owners, employees, consumers and society at large. For junior, senior and graduate students. Open to nonbusiness majors.

PHIL	313	Environmental Ethics	Conceptual and moral foundations of environmental ethics, focusing on ecosystem and wildlife conservation policies, animal rights, a land ethic, competing policy analyses and obligations to future generations.
PHYS	481	Experimental Physics	Techniques and methods of experimental physics including: use of sensors, transducers, time series, power spectra, phase sensitive detection, computer interfacing and signal conditioning. Experiments cover several areas of physics.
POSC	485	Women in Politics	Changing political environment and women's role in elected, appointed and other public agencies; issues of particular concern to women, including family issues, comparable worth and other economic issues and political participation.
POSC	484	Urban Planning Methods	Seminar and Practicum on methods in urban planning. Analytical techniques and basic data sources. Population forecasting, housing surveys, economic development, fiscal impacts and area revitalization. Individual and team projects.

POSC	478	Urban Planning Principles	Seminar/discussion on conceptual themes and legal foundations of American urban planning. Policy areas associated with urbanization and suburbanization processes: land use, economic development, redevelopment, housing systems, neighborhood dynamics and growth management.
POSC	475	Administrative Law	Law as it affects public officials and agencies in their relations with private citizens and the business community. Case materials and regulatory practices.
POSC	461	UN/Public International Organizations	Structure, functions and political processes of the United Nations, various specialized organizations such as the World Bank and regional organizations such as the European Community.
POSC	457	Politics of International Economics	Link between economics and international politics. Political economy of free trade and imperialism, of neo-colonialism and foreign aid.

POSC	446	Corruption, Ethnic and Public Policy	Ethical problems that face persons in the public service. Focuses on practical decision-making.
POSC	427	Policy Making: Urban Metro Issues	Policy issues and alternatives in urban and metropolitan problem areas, such as law enforcement, transportation, housing or poverty.
POSC	421	Government and the Economy	Regulation and deregulation of business. Industrial policy. Government taxes and expenditures. Emphasizes national government.
POSC	403	Politics & Policy in Sacramento	Nature of policy making in California's state capital. Persistent policy themes and constraints; current issues in education policy. Required three-day trip to Sacramento for seminars and policy briefings.

POSC	322	Leadership for Public Service	Conceptions of leadership as applied in governmental and nonprofit sectors. Types of leader; tools for leaders; leadership in public policy-making settings. Includes student project and extend leadership concepts; participation in CSUF Student Leadership Institute or similar activity.
RTVF	375	Documentary Film and TV	Documentary form in film and television. History, theory, development, purpose and current trends in the documentary genre.
SCED	495	Naturalist Internship	Supervised field experience permitting application of science education in research, industry and educational settings. For current and prospective science teachers. Periodic class meetings and field experience log and summary are required.
SCED	412	Processes of Science	Methodologies (action research), logical procedures and explanatory systems that characterize the various natural sciences. Role of science and technology in society.

SOCI	371	Sociology of City Life	Ecology, patterns of growth, institutional inequalities, social problems, cultures and organized resistances of urban communities in global contexts. One or more sections offered online
SOCI	361	Population and the Environment	Population composition, growth and movement. Social factors affecting birth rates, death rates and migration. Environmental and resource base implications of population growth, urbanization and migration. Role of the economy, poverty, gender and development on population dynamics.
SOCI	356	Social Inequality	Development, patterns, structures and consequences of social inequality, with emphasis on social class, race, ethnicity, gender and sexuality in the U.S. Dynamics of resistance and social change. One or more sections offered online.
SOCI	355	Women in Contemporary Societies	Micro and macro analyses of women's roles and experiences in contemporary societies. Topics may include gender socialization, institutional inequalities, women's work, violence against women, resistance to inequality, women's health and sexuality

SOCI	352	The Sociology of Education	Education as a social institution and agent of socialization. Dynamic interplay with economic, political, religious, family institutions and community. Gender, race and class inequality in education. Cross-national perspectives on education and related social problems and social policy.
WMST	205	Gender and Globalization	How globalization affects women's lives through the distribution of wealth, knowledge and opportunity. Focuses on local and transnational responses to global processes and how activists can work within and between these movements. International in focus.

Total: 171

Courses that include Sustainability: Graduate

Dept	Course ID	Course Title	Course Description
ANTH	504T.29	Human Impacts on the Environment	Examines theoretical perspectives and methodological issues regarding human impacts on ancient environments based on evidence from archaeological, biological, and environmental data.
COMM	515T	Professional Problems in Specialized Fields	Selected topics and issues in the field of mass communications. Subjects vary each semester
ECON	516	Economics and Benefit-Cost Analysis	Economics and benefit-cost analysis of public projects. Consumer demand and the estimation of benefits; the nature of cost in a market economy; price controls, unemployment and inflation; and criteria for choice, for multi-year projects. For elective credit in the M.S. Environmental Studies or Master of Public Administration.

ECON	534	Seminar in Environmental and Natural Resource Economics	Environmental economics and natural resource economics topics, which may include market failures, public goods, environmental goods, policies for pollution, renewable and non-renewable resources, land and sustainability.
EDAD	503	Organizational Leadership	Using organizational theory and leadership studies to understand schools and how to bring about change in schools. Organization, structure and cultural context of schools and the study of techniques used to guide, motivate, delegate, build consensus and lead others in the achievement of goals.
EDEL	536	Curriculum Theory & Development	School curriculum, including the forces operating on the curriculum and the participants involved in curriculum building. Process of curriculum building.
EDEL	533	Graduate Studies in Elementary Education: Science	Research and materials in science education and criteria for planning and improving science programs and instruction.

EDEL	521	The Study of Teaching	The teaching process. Research methodology used to analyze teaching, the current knowledge of the association between teaching processes and student learning, and the implications of the research for the classroom.
EDEL	511	Survey of Education Research	Descriptive statistics and statistical inferences in educational research. Representative research papers. Principles of research design. Prepare papers using research findings.
EGCE	597	Graduate Project	Prerequisites: Classified graduate status and formal approval of Civil Engineering Graduate Committee, graduate adviser and department head.
EGCE	583	Pollution Control Engineering	Sources and impacts of air pollutants, methods of sampling and analysis, air dispersion modeling, control techniques and system design for common air pollutants, climate changes, green technologies and greenhouse emission control.

EGCE	546	Surface Water Pollution & Control	Sources, quality and quantity of storm water runoff, best management practices (BMPs), system design of structural BMPs, green technologies, design for wastewater discharge into rivers, lakes and oceans.
EGCE	537	Groundwater & Seepage	Equations governing flow of liquid in porous media. Seepage through dams and under structures, flow in confined and unconfined aquifers, steady and unsteady flow, well fields, flow nets, computer solutions, sea water intrusion, recharge, groundwater pollution.
EGCE	532	Earthquake Engineering	Earthquake motions; response spectra; computational methods and computer applications for response of structural systems. Energy absorption capacity of materials and structural components. Soil structure interaction. Seismic design and evaluation of current building codes
EGCE	515	Solid Waste Management, System Design and Sustainability	Industrial waste treatment and disposal, waste minimization, process selection, control, green technologies and resource recovery. Design of liners, gas and leachate collection and removal systems in landfills.

EGCE	581	Remediation of Contaminated Soil and Groundwater	Site assessment, green technologies, design for soil remediation systems and design for groundwater remediation systems.
EGCE	582	Wastewater Treatment and Water Reclamation	Principles of anoxic, aerobic and anaerobic biological processes and treatment. Stepwise development and process design equipment selection, economic evaluation, green technologies and operating guidelines for wastewater treatment.
EGME	530	Advanced Strength of Materials	Energy methods. Castilian's theorem. Curved beams, beams on elastic supports, thick wall cylinders, shrink fits, localized stress, column instability, failure theories, bearings.
EGME	512	Advanced Mechanical Design and Management	Advanced modern mechanisms. Analysis and synthesis of mechanisms. Advanced topics in computer-aided design of mechanical, thermal and fluid systems. Methodology of modern design. Optimization in design.

ENST	599	Independent Graduate Research	Prerequisites: graduate standing in Environmental Studies and consent of instructor and program coordinator.
ENST	598	Thesis	Prerequisites: classified status in Environmental Studies program and consent of instructor and program coordinator. Planning, preparing and completing an acceptable, interdisciplinary thesis. Credit on submission of thesis.
ENST	597	Project	Prerequisites: classified status in Environmental Studies program and consent of project adviser and program coordinator. Planning, preparing and completing an acceptable, interdisciplinary project. Credit on submission of project and presentation of research findings in a poster session organized by the Environmental Studies Program.
ENST	596	Internship in Environmental Studies	Prerequisite: graduate standing in Environmental Studies. Field experience with a governmental or private agency.

ENST	520	Environmental Research and Analysis	Research methods used in environmental studies. Research tools used in such areas as environmental field studies, environmental experiments, social environmental impacts, environmental attitudes and behavior, and environmental trend analysis.
ENST	510	Environmental Evaluation and Protection	Environmental parameters (water, air, solid wastes, noise, radiation, etc.). Techniques in monitoring and measurement; effect on human health; environmental quality standards and controls. Demonstrations and field trips
ENST	500	Environmental Issues and Approaches	Interdisciplinary approaches to environmental problems and research methods. Students prepare seminars and papers on research design for potential thesis topics. Meets graduate writing requirement.
ENST	595T	Selected Topics in Environmental Problems	Various environmental topics, contemporary or historic, that focus on problems (e.g., law, endangered habitats, planning, global environmental issues, etc.)

GEOG	550	Seminar: Human Geography	Survey of methodology and case studies, including: experiential environments; rural landscapes; urban, social and economic structure; geography and public policy; and Third World development. Meets the graduate level writing requirement.
GEOG	530	Seminar: Political Ecology	Various topics selected from any of the subfields of geography. The topic chosen and a general outline of the seminar are circulated prior to registration.
GEOG	520	Seminar: Physical Geography	Research in physical geography: methods and contemporary themes. Case studies in climatology, geomorphology and plant geography.
GEOG	533	Environmental Change	Examination of broad processes of human-induced environmental change, both global and regional. Focus on literature on the nature of large-scale changes in the earth's environmental systems that have accompanied historical changes in cultures, society, economics, politics, and technologies.

GEOL	575	Advanced topics in Engineering Geology	Modern techniques and recent advances in engineering geology, such as Quaternary geology, landslide analysis and paleoseismology.
GEOL	535T	Advanced topics in Hydrogeology	Modern techniques and recent advances in hydrogeology, such as groundwater modeling, well hydraulics and aquifer analysis, contaminant hydrogeology, hydrogeochemistry and environmental sampling and protocols.
GEOL	510T	Advanced topics in Geology	Modern techniques and recent advances in geology, such as basin analysis, carbonate sedimentology, paleontology, paleolimnology, igneous petrology, tectonics and studies of the Mesozoic Era.
GEOL	506T	Topics in Geochemistry	Special topics on modern techniques and recent advances in geochemistry, such as geochronology and environmental isotope geochemistry.

HESC	540	Advanced Study in Health Promotion and Disease Prevention	Psychological, social, ecological, economic and political theories relevant to the mission and process of health promotion. Application of behavioral change techniques and health education methodology to health promotion targeting individuals and whole communities.
HESC	524	Public Health Administration	Principles, practices and skills essential to successful public health administration. U.S. health care system and factors that shape it. Public health services and administration, patterns of diseases, managed care, ethics and quality of care.
HESC	515	Advanced Environmental Health	Ecological impacts of human activities and the need to control factors that are harmful to human health. A framework is provided for investigation/ management of health hazards. Principles of environmental health emphasizes the relationships between population, natural resources, disease, toxicology and pollution.
MATH	504B	Applications of Simulation Modeling Techniques	Introduction to a modern simulation language and its application to simulation modeling. Topics will include development of computer models to demonstrate the techniques of simulation modeling, model verification, model validation and methods of error analysis.

MATH	504A	Simulation Modeling & Analysis	Advanced techniques of simulation modeling, including the design of Monte Carlo, discrete event and continuous simulations. Topics may include output data analysis, comparing alternative system configurations, variance-reduction techniques and experimental design and optimization.
MATH	503B	Mathematical Modeling II	Development and analysis of mathematical models in such areas as mechanics, economic planning, operations management, environmental and ecological sciences, biology and medicine.
MATH	503A	Mathematical Modeling I	Mathematical modeling concepts. Topics may include: dimensional analysis, scaling and sensitivity; system concepts, state space, observability, controllability and feedback; dynamical systems, models and stability analysis; optimization models.
MATH	501B	Numerical Analysis and Comp. II	Numerical methods for initial and boundary-value problems for ordinary and partial differential equations. The finite element method. Error analysis, comparison, limitations of algorithms.

MATH	501A	Numerical Analysis and Comp. I	Numerical methods for linear and nonlinear systems of equations, eigenvalue problems. Interpolation and approximation, spline functions, numerical differentiation, integration and function evaluation. Error analysis, comparison, limitations of algorithms.
POSC	580	Emergency Management in P.A.	Comprehensive review of the state-of-the-art in prevention, warning, evacuation, rescue and recovery systems. Development of public policy relating to land use planning, recovery and issues of liability; intergovernmental relations and effective planning.
POSC	540	Seminar: Readings in Political Philosophy	Foundations of contemporary political science through readings in the classics of political philosophy.
POSC	528	Administration & Policy	Interplay between public policy and program administration in federal government. Discussion of administrators' role in policy development, administrative discretion in implementing policy, use of political resources by administrators.

POSC	525	Seminar: Metro Area Government	Political and policy issues facing metropolitan America, and the capacity of governmental institutions to handle urban problems.
POSC	523	Administrative Research & Ana...	Conceptual methods employed in administrative research and analysis: Organization and procedure of surveys, performance evaluation, social impact assessment, computer data analysis and report writing.
POSC	519	State & Local Government	Structure, processes, functions and interrelationships of state and local governments in American society. State, county, municipal and special district government in California as compared with other states.
POSC	509	Administrative Organization & Process	For graduate students in public administration who have not had an introductory course in public administration. Organizational theory and practice, decision-making, systems analysis, performance evaluation and administrative improvement.

SCED	554	Issues in Science Education	Major contemporary issues in science education.
SCED	550	Theoretical Designs in Science Ed.	Review of major directions, designs and assumptions of science education reform such as the nature of science and scientific inquiry, scientific literacy, the National Science Education Standards, state curricular frameworks, standards and international and national science assessment. How reform affects curriculum, major curricular projects and curricular evaluation.
SOCI	501T	Topics in Societal Structure and Process	Analysis of a specialization within the study of society such as: socialization and personality; deviance; social change; institutional structure and process.

Total: 53