

## SUSTAINABILITY-FOCUSED COURSES

	DEPARTMENT	COURSE NO.	COURSE NAME	COURSE DESCRIPTION
<b>UNDERGRADUATE COURSES</b>				
1	Anthropology	ANTHRO 20A	People, Culture and Environmental Sustainability	Anthropological consideration of global environmental sustainability from the perspective of human cultures and communities. Causes and consequences of population growth, natural resource management, environmental law, environmental ethics. Case studies emphasize tropical rain forests, arid lands of Africa and North America.
2	Anthropology	ANTHRO 30A	Global Issues in Anthropological Perspective	Explores anthropological perspectives on issues of importance in an increasingly global society. Topics include emphases on ethnic conflict; identity; immigration and citizenship; religion and religious diversity; medical anthropology; legal anthropology; development and economic change; gender.
3	Anthropology	ANTHRO 41A	Origins of Global Interdependence	Offers a general overview of the rise of global interdependence in political, economic, demographic, and cultural terms. Considers what drove people from relative isolation into intensified intercourse with one another, and investigates the consequences of this shift.
4	Biological Sciences	BIO SCI 23	Sustainable Landscaping	Sustainability-focused description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
5	Biological Sciences	BIO SCI 55	Introduction to Ecology	Principles of ecology; application to populations, communities, ecosystems, and humans.

6	Biological Sciences	BIO SCI 191A	Senior Seminar on Global Sustainability	Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations. Prepare bibliography.
7	Biological Sciences	BIO SCI 191B	Senior Seminar on Global Sustainability II	Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations. Prepare research proposal.
8	Biological Sciences	BIO SCI 191CW	Writing/Senior Seminar on Global Sustainability III	Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze Forum presentations and to prepare senior research paper. Prepare/write research paper under direction of faculty member.
9	Biological Sciences	BIO SCI E150	Conservation Biology	Genetic and ecological issues in conservation biology, including effects of human population growth, the value of biodiversity, conservation genetics, demography, metapopulation dynamics, community and ecosystem processes, species invasions, global climate change, and reserve design and management.
10	Chemical Engineering and Materials Science	CBEMS 158	Ceramic Materials for Sustainable Energy	A technical elective for students interested in the materials area. Topics covered include structure and properties of ceramics, and design with ceramics for sustainable energy applications.
11	Civil and Environmental Engineering	ENGR CEE 60	Contemporary and Emerging Environmental Challenges	Introduces contemporary and emerging environmental challenges, illustrates links between human behavior, environmental policy and engineering practices, examines policy options in the context of current institutions, and introduces tools and frameworks to reach sound economic, social, and environmental solutions.

12	Civil and Environmental Engineering	ENGR CEE 125	Transportation and the Environment	Analysis of the impacts of motor vehicle transportation on the environment. Introduction to life cycle analysis applied to transportation. Basic economic tools for transportation externalities. Transportation planning, urban form, health, and the environment. Transportation sustainability.
13	Civil and Environmental Engineering	ENGR CEE 160	Environmental Processes	Introduction to environmental processes in air and water, mass balances, and transport phenomena. Fundamentals of water-quality engineering including water and wastewater treatment.
14	Civil and Environmental Engineering	ENGR CEE 162	Introduction to Environmental Chemistry	Basic concepts from general, physical, and analytical chemistry as they relate to environmental engineering. Particular emphasis on the fundamentals of equilibrium and kinetics.
15	Civil and Environmental Engineering	ENGR CEE 167	Ecology of Coastal Waters	Examines the ecological processes of the coastal environment. Investigates the causes of coastal ecosystem degradation and strategies to restore the ecosystem balance or prevent further coastal ecosystem health degradation.
16	Civil and Environmental Engineering	ENGR CEE 171	Water Resources Engineering	Principles governing the analysis and design of water resource systems including pressurized pipelines, pipe networks, channels and ground water. Coverage of fluid mass, momentum and energy conservation, flow resistance and related laboratory measurements in different systems.
17	Civil and Environmental Engineering	ENGR CEE 172	Groundwater Hydrology	Topics include conservation of fluid mass, storage properties of porous media, matrix compressibility, boundary conditions, flow nets, well hydraulics, groundwater chemistry, and solute transport. Design projects and computer applications included.

18	Civil and Environmental Engineering	ENGR CEE 173	Computer Tools for Watershed Model	Basic principles of hydrologic modeling are practiced. Concepts of watershed delineation, land use change impact, design studies, and GIS tools are discussed. Focus on the USACE (HEC) software tools (HEC-HMS, and HEC-RAS) along with their associated GIS interfaces.
19	Civil and Environmental Engineering	ENGR CEE 176	Hydrology	Elements of the hydrologic cycle including precipitation, infiltration, evapotranspiration, ground water, and runoff. Unit Hydrograph theory and routing methods. Introduction to precipitation/runoff relationship and watershed modeling. Statistical methods and flood frequency analysis.
20	Civil and Environmental Engineering	ENGR CEE 181 A	Senior Design Practicum	Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.
21	Civil and Environmental Engineering	ENGR CEE 181 B	Senior Design Practicum	Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.

22	Civil and Environmental Engineering	ENGR CEE 181 C	Senior Design Practicum	Team designs land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of roads, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/Written interim and final design reports. Laboratory sessions.
23	Earth System Science	EARTHSS 15	Introduction to Global Climate Change	Introduction of scientific, technological, environmental, economic, and social aspects underlying the threat and understanding of global climate change. Human and natural drivers of climate. Impacts of climate on natural, managed, and human systems, including their vulnerability and ability to adapt.
24	Earth System Science	EARTHSS 23	Air Pollution and Global Environment	Air pollution occurs on regional to global scales. A wide range of air pollution sources and physical, chemical, and meteorological sciences behind air pollution are introduced. The consequences of air pollution to our society are also discussed.
25	Earth System Science	EARTHSS 60A	Earth and Environmental Science	An introduction to the physical environment, biological systems, and human-environment interactions. Explores physical principles such as fluid transport and reaction rates using environmental examples as well as principles of populations, ecosystems, carrying capacity, and sustainable use of resources.
26	Earth System Science	EARTHSS 60B	Local and Regional Environmental Issues	An introduction to common environmental issues using case studies from Orange County and California. Studies natural hazards as well as human-caused problems with air quality, water quality, coastal pollution, ecosystem degradation, and urban climate.

27	Earth System Science	EARTHSS 112	Global Climate Change	Observations over the 20th century show extensive changes in atmospheric composition, climate and weather, and biological systems that have paralleled industrial growth. Evidence of globally driven changes in these biogeochemical systems is studied, including projected impacts over the 21st century.
28	Earth System Science	EARTHSS 178	Solving the Energy Carbon Climate Problem	Why is climate change such a difficult problem? What can we do about it? The course will introduce the global politics of energy and climate, assess options for decreasing energy demand, generating low-carbon energy, sequestering carbon, geoengineering, and adaptation.
29	Earth System Science	EARTHSS 180	Environmental Sustainability I	Provides an introduction to sustainability from different points of view; historical, scientific, political, ethical, and economic.
30	Earth System Science	EARTHSS 182	Environmental Sustainability II	Investigates how sustainability can be implemented in a variety of contexts including water, energy, non-renewable resources, biodiversity, and urban policy, and also how it could be measured.
31	Earth System Science	EARTHSS 190A	Senior Seminar on Global Sustainability I	Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations. Prepare bibliography.
32	Earth System Science	EARTHSS 190B	Senior Seminar on Global Sustainability II	Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations. Prepare research proposal.

33	Earth System Science	EARTHSS 190CW	Writing/Senior Seminar on Global Sustainability III	Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze Forum presentations and to prepare senior research paper. Prepare/write research paper under direction of faculty member.
34	Economics	ECON 145E	Economics of the Environment	Surveys economic aspects of natural resources, pollution, population, and the environment. Examines the causes of pollution; analysis of public policies regarding these problems. Emphasis on microeconomic aspects of environmental problems.
35	Economics	ECON 145FW	Economics of the Environment II	Applications of the tools covered in Economics 145E to such topics as global warming, destruction of the ozone layer, and emissions trading. Emphasis on independent research papers. Syllabus and classes include writing technique.
36	Information and Computer Science	I&C SCI 5	Environmental Issues in Information Technology	Explores the relationship between recent developments in information technology and current global environmental issues. Potential topics include ecoinformatics, e-waste, technological life cycle assessment, and online community building. Activities involve reading, writing, discussion, and a final project.
37	International Studies	INTL STU 122	Nuclear Environments	Understanding the impact of the nuclear age on the environment and human health through interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia.

38	Mechanical and Aerospace Engineering	ENGR MAE 110	Combustion and Fuel cell Systems	Fundamentals of gaseous, liquid, and coal-fired combustion and fuel cell systems. Fuels, fuel-air mixing, aerodynamics, and combustion and fuel cell thermodynamics. Operating and design aspects of practical systems including engines, power generators, boilers, furnaces, and incinerators.
39	Mechanical and Aerospace Engineering	ENGR MAE 118	Sustainable Energy Systems	Basic principles, design, and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal, and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation.
40	Mechanical and Aerospace Engineering	ENGR MAE 164	Air Pollution and Control	Sources, dispersion, and effects of air pollutants. Topics include emission factors, emission inventory, air pollution, meteorology, air chemistry, air quality modeling, impact assessment, source and ambient monitoring, regional control strategies.
41	Planning, Policy & Design	PP&D 112	Foundations of Community Health	A social ecological framework for understanding community health is presented. Measures of individual and community health are compared, and the influence of personal and environmental factors on individual, group, and population health is examined. Community health promotion strategies are discussed.
42	Planning, Policy & Design	PP&D 131	Environmental Sustainability I	Provides an introduction to sustainability from different points of view; historical, scientific, political, ethical, and economic.
43	Planning, Policy & Design	PP&D 132	Environmental Sustainability II	Investigates how sustainability can be implemented in a variety of contexts including water, energy, non-renewable resources, biodiversity, and urban policy, and also how it could be measured.



44	Planning, Policy & Design	PP&D 134	Human Ecology	Explores the interaction of social choice and physical constraint in shaping the earth's human carrying capacity, including ramifications for local, regional, or global environmental issues.
45	Planning, Policy & Design	PP&D 139	Water Resource Policy	Examination of contemporary water problems worldwide, with particular attention to the competing water demands in the western U.S., and water demand by the poor in developing countries. History and analysis of U.S. water policies at local, state, and federal levels.
46	Political Science	POL SCI 41A	Introduction to International Relations	Analysis of political relations between and among nations with emphasis on explanations of conflict and cooperation. The role of ideologies and their relation to international problems are also examined.
47	Political Science	POL SCI 129	Water Resource Policy	Studies in selected areas of American politics and society. Topics addressed vary each quarter.
48	Psychology and Social Behavior	PSY BEH 182P	Environmental and Public Health Policy	Sustainability-focused description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
49	Public Health	PUB HLTH 90	Natural Disasters	Natural disasters are natural processes that adversely affect humans. By examining these processes students develop a basic understanding of Earth's physical environment. Topics include: tectonics, earthquakes, volcanoes, landslides, severe weather, flooding, climate change, mass extinctions and impacts with space objects.
50	Public Health	PUB HLTH 124	Environmental and Public Health Policy	Examines factors involved in shaping public health and environmental policy. Topics include the role of science in public health policy, the function of governmental regulatory agencies, citizen participation, and economic and sociopolitical aspects of controlling infectious diseases and regulating carcinogens.

51	Public Health	PUB HLTH 125	Foundations of Community Health	A social ecological framework for understanding community health is presented. Measures of individual and community health are compared, and the influence of personal and environmental factors on individual, group, and population health is examined. Community health promotion strategies are discussed.
52	Public Health	PUB HLTH 163	Environmental Health Science	Focuses on processes of exposure to environmental toxins/agents and their impact to human health and the environment. Media transport, exposure assessment, susceptibility, behavior, and health effect of several toxins are discussed.
53	Public Health	PUB HLTH 167	Air Pollution, Climate and Health	Introduction to how air pollutants are emitted into the atmosphere, how people are most exposed to air pollutants in developed and developing areas, physical and meteorological processes that affect transport, and the influence of air pollutants on global warming.
54	Public Health	PUB HLTH 168	Nuclear Environments	Understanding the impact of the nuclear age on the environment and human health through interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia.
55	Public Health	PUB HLTH 171	Human Exposure to Environmental Contaminants	Introduces origins of human's realization that chemicals in the environment may adversely affect health. Introduces the theory and principles of exposure assessment. Covers estimation of exposure, variability of measures, the way exposure assessment is incorporated into the risk-assessment paradigm.

56	Public Health	PUB HLTH 173	Health and Global Environmental Change	Overview of scientific underpinnings of global environmental change and human health consequences. Provides an understanding of the fundamental dependency of human health on global environmental integrity. Encourages disciplinary cross-fertilization through interaction of students in environmental, health, and policy sciences.
57	Social Ecology	SOCECOL E127	Nuclear Environments	Understanding the impact of the nuclear age on the environment and human health through interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia.
58	Social Ecology	SOCECOL 186A	Environmental Sustainability I	Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations. Prepare bibliography.
59	Social Ecology	SOCECOL 186B	Environmental Sustainability II	Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations. Prepare research proposal.
60	Social Ecology	SOCECOL 186CW	Writing/Senior Seminar on Global Sustainability III	Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze Forum presentations and to prepare senior research paper. Prepare/write research paper under direction of faculty member.

61	University Studies	UNI STU 13A	Environmental Studies I	Introduces Earth as a system and living planet. Examines physical and biological resources as well as energy, water, climate, and ecosystems. Introduces and applies analytic lens of environmental, social, and economic sustainability to examine human impacts and resource use.
62	University Studies	UNI STU 13B	Environmental Studies II	Introduces Earth as a system and living planet. Examines physical and biological resources as well as energy, water, climate, and ecosystems. Introduces and applies analytic lens of environmental, social, and economic sustainability to examine human impacts and resource use.
63	University Studies	UNI STU 13C	Environmental Studies III	Introduces Earth as a system and living planet. Examines physical and biological resources as well as energy, water, climate, and ecosystems. Introduces and applies analytic lens of environmental, social, and economic sustainability to examine human impacts and resource use.
64	University Studies	UNI STU 17 A	Water I	Introduces students to water as a global and contested resource across space, time, and peoples from a scientific, historical and policy perspective. Wherever possible, examples are drawn from the local environment.
65	University Studies	UNI STU 17 B	Water II	Introduces students to water as a global and contested resource across space, time, and peoples from a scientific, historical and policy perspective. Wherever possible, examples are drawn from the local environment.
66	University Studies	UNI STU 17 C	Water III	Introduces students to water as a global and contested resource across space, time, and peoples from a scientific, historical and policy perspective. Wherever possible, examples are drawn from the local environment.

## SUSTAINABILITY-FOCUSED COURSES

	DEPARTMENT	COURSE NO.	COURSE NAME	COURSE DESCRIPTION
<b>GRADUATE COURSES</b>				
1	Chemistry	CHEM 241	Issues Related to Tropospheric and Stratospheric Processes: Global Climate Change	Examination of current issues related to the atmosphere, including energy usage; toxicology; effects on humans, forests, plants, and ecosystems; particulate matter (PM10); combustion; modeling and meteorology; airborne toxic chemicals and risk assessment; application of science to development of public policies.
2	Civil and Environmental Engineering	ENGR CEE 264	Carbon Footprint Analysis for Water and Wastewater Systems	Mass- and energy-flux balance analysis applied to water and wastewater treatment systems. Case studies include analysis and design of aeration, membrane separations, disinfection, water supply, and water reclamation processes.
3	Civil and Environmental Engineering	ENGR CEE 267	Ecology of Coastal Waters, Graduate level	Examines the ecological processes of the coastal environment. Investigates the causes of coastal ecosystem degradation and strategies to restore the ecosystem balance or prevent further coastal ecosystem health degradation.
4	Civil and Environmental Engineering	ENGR CEE 273	Computer Tools for Watershed Model, Graduate level	Basic principles of hydrologic modeling are practiced. Concepts of watershed delineation, land use change impact, design studies, and GIS tools are discussed. Focus on the USACE (HEC) software tools (HEC-HMS, and HEC-RAS) along with their associated GIS interfaces.

5	Civil and Environmental Engineering	ENGR CEE 276	Hydrology, Graduate level	Elements of the hydrologic cycle including precipitation, infiltration, evapotranspiration, ground water, and runoff. Unit Hydrograph theory and routing methods. Introduction to precipitation/runoff relationship and watershed modeling. Statistical methods and flood frequency analysis. Discussion section covers advanced topics.
6	Civil and Environmental Engineering	ENGR CEE 267	Coastal Ecology	Examines the ecological processes of the coastal environment. Investigates the causes of coastal ecosystem degradation and strategies to restore the ecosystem balance or prevent further coastal ecosystem health degradation.
7	Criminology, Law, and Society	CRM/LAW C252	Issues in Environmental Law and Policy	Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists.
8	Earth System Science	EARTHSS 202	Climate Change	Explores past, present, and projected changes in Earth's climate. Topics include paleoclimate records and mechanisms of natural climate variability at a range of timescales (orbital to seasonal); General Circulation Models; and IPCC observations and projections of future climate change.
9	Earth System Science	EARTHSS 224	Ocean Processes	Introduction to the physics, chemistry, and biology of the oceans. Offers a mechanistic perspective of the structure and functioning of marine ecosystems, nutrient cycles, and role of ecosystem dynamics in local and global biogeochemistry.

10	Earth System Science	EARTHSS 226	Land Surface Processes	Introduction to the physics, chemistry, and biology of the oceans. Offers a mechanistic perspective of the structure and functioning of marine ecosystems, nutrient cycles, and role of ecosystem dynamics in local and global biogeochemistry.
11	Law	LAW 553	Seminar International Environmental Law	Sustainability-focused description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
12	Law	LAW 597AC	Advanced Community and Economic Development	Sustainability-focused description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
13	Law	LAW 597AE	Advanced Environmental Law	Sustainability-focused description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
14	Law	LAW 597C	Community and Economic Development	Sustainability-focused description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
15	Law	LAW 597E	Environmental Law	Sustainability-focused description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
16	Law	LAW 5787	Environmental Law & Policy	Sustainability-focused description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
17	Law	LAW 5788	Federal Public Land and Natural Resource Law	Sustainability-focused description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
18	Mechanical and Aerospace Engineering	ENGR MAE 218	Sustainable Energy Systems	Basic principles, design and operation of sustainable energy systems including wind, solar photo-voltaic and thermal, hydroelectric, geothermal, oceanic, biomass combustion, advanced coal and next generation nuclear. Includes power generation, storage, and transmission for stationary power generation.

19	Mechanical and Aerospace Engineering	ENGR MAE 260	Issues Related to Tropospheric and Stratospheric Processes: Global Climate Change	Examination of current issues related to the atmosphere, including energy usage; toxicology; effects on humans, forests, plants, and ecosystems; particulate matter (PM10); combustion; modeling and meteorology; airborne toxic chemicals and risk assessment; application of science to development of public policies.
20	Planning, Policy & Design	PP&D 224	Environmental Politics and Policy	Reviews and critiques literature on discussion topics including: the nature and effectiveness of environmental movements and policies; the role of science and technology; the use of economic incentives in policy; decentralization of decision making; and creating arenas for public involvement.
21	Planning, Policy & Design	PP&D 231	Transportation and Environmental Health	Critically evaluates how transportation can promote sustainable, healthy, and equitable cities. Examines the interaction of transportation systems with urban form, land use, community health, and environmental quality.
22	Planning, Policy & Design	PP&D 252	Issues in Environmental Law and Policy	Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists.
23	Planning, Policy & Design	PP&D 270	Environmental Ethics	Introduction to major themes and debates in environmental ethics, with application to contemporary environmental issues.
24	Public Health	PUB HLTH 264	Environmental Health Science	For first- and second-year doctoral students. Topics include professional development; journal publication process; academic conference presentations; and the job market for doctoral students in environmental health.



## SUSTAINABILITY-RELATED COURSES

	DEPARTMENT	COURSE NO.	COURSE NAME	COURSE DESCRIPTION
	<b>UNDERGRADUATE COURSES</b>			
1	African American Studies	AFAM 128	Race, Gender & the Environment	Expressions of genders and sexualities across the spectrum of African American experience and creativity.
2	Anthropology	ANTHRO 125A	Economic Anthropology	Examines depictions of and by African American women in art and popular culture through a variety of media including textiles, painting, sculpture, photography, and installation. Focuses on African American women's experiences, perspectives, and strategies for contemporary representation.
3	Anthropology	ANTHRO 136D	Conflict Management in Cross-Cultural Perspective	Sustainability related description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
4	Biological Sciences	BIO SCI 9E	Horticultural Science	Scientific principles of horticulture at the UCI Arboretum. Taxonomy, plant life history strategies; experiments with seed dormancy; morphological adaptations for specialized sexual and clonal reproduction; basics of plant propagation and ecological restoration. Laboratory fee.
5	Biological Sciences	BIO SCI 94	From Organisms to Ecosystems	Patterns of diversity, ecology, and evolutionary biology. Emphasis is on the Tree of Life and how its members are distributed and interact.
6	Biological Sciences	BIO SCI E106	Process in Ecology and Evolution	An in-depth study of the mechanisms that drive evolution and ecology including: natural selection, mutation, genetic drift, speciation, extinction, life history patterns, population dynamics, ecosystem and community structure, predator-prey and host pathogen interactions, and social behavior.

7	Biological Sciences	BIO SCI E118	Ecosystems Ecology	Literature-based, interactive discussions focused on review of seminal historic and recent immunology literature. Student responsibilities include reading, critical evaluation, and discussion of manuscripts.
8	Biological Sciences	BIO SCI E120	Marine Biology	Examines how the physical environment influences biology of marine life, the relationship between structure and function in adaptation to marine environments, and anthropogenic impacts on marine life. A field trip is required.
9	Biological Sciences	BIO SCI E127	Physiological Plant Ecology	An examination of the interactions between plants and their environment. Emphasis on the underlying physiological mechanisms of plant function, adaptations and responses to stress, and the basis of the distribution of plants and plant assemblages across the landscape.
10	Biological Sciences	BIO SCI E140	Evolution and Environment	Explores basic topics in ecology and evolutionary biology and applications to agriculture, conservation, environmental issues, and public health. Format involves discussion of scientific journal articles and other readings, with focus on learning to evaluate scientific evidence.
11	Biological Sciences	BIO SCI E150	Conservation Biology	Genetic and ecological issues in conservation biology, including effects of human population growth, the value of biodiversity, conservation genetics, demography, metapopulation dynamics, community and ecosystem processes, species invasions, global climate change, and reserve design and management.
12	Biological Sciences	BIO SCI E172	Plant Diversity	Investigation of planet diversity in California and throughout the world, including basic systematic concepts, an introduction to major groups of flowering plants, and the effects of global biological change on plant diversity.

13	Biological Sciences	BIO SCI E175	Restoration Ecology	Theoretical and practical aspects of habitat restoration and mitigation. Design, implementation, and monitoring of restoration projects in local habitats. Collection of seed and cuttings, planting and maintenance presented. Control of exotics in natural areas discussed. Environmental ethics of restoration emphasized.
14	Biological Sciences	BIO SCI E179	Limnology Freshwater Ecology	Biology of freshwater environments: lakes, ponds, rivers, their biota, and the factors which influence distribution of organisms.
15	Biological Sciences	BIO SCI E182	Mediterranean-Type Ecosystems: Biodiversity and Conservation	Biodiversity, history of human impacts, and conservation efforts are examined in the five Mediterranean-type ecosystems. Remaining natural habitat, approaches to ecological habitat restoration, control of exotic species, and predicted consequences of global climate change are described. Field trip required.
16	Biological Sciences	BIO SCI E186	Population and Community Ecology	Population structure, function, development, and evolution. Topics include population structure, population growth and regulation, metapopulations, predation, competition, species diversity, ecosystem function, macroecology, and island biogeography. Offered every other Winter.
17	Civil and Environmental Engineering	ENGRCEE 163	Biological Treatment Process Design	Design of biological treatment processes. Topics include attached and suspended growth, aeration, anaerobic systems, process control and economics. Design projects included.
18	Earth System Science	EARTHSS 1	The Physical Environment	Covers the origin and evolution of the Earth, its atmosphere, and oceans, from the perspective of biogeochemical cycles, energy use, and human impacts on the Earth system.

19	Earth System Science	EARTHSS 3	Oceanography	Examines circulation of the world oceans and ocean chemistry as it relates to river, hydrothermal vent, and atmospheric inputs. Geological features, the wide variety of biological organisms, and global climate changes, such as greenhouse warming, are also studied.
20	Earth System Science	EARTHSS 5	The Atmosphere	The composition and circulation of the atmosphere with a focus on explaining the fundamentals of weather and climate. Topics include solar and terrestrial radiation, clouds, and weather patterns.
21	Earth System Science	EARTHSS 7	Geology	Introduction to Earth materials and processes. Topics include rocks and minerals, plate tectonics, volcanoes, earthquakes, Earth surface processes, Earth resources, geologic time, and Earth history. Laboratory work involves hands-on study of geologic materials, maps, and exercises pertaining to geologic processes.
22	Earth System Science	EARTHSS 17	Catastrophes	Introduction to the basic science and state of predictability of various natural catastrophic events including earthquakes, volcanic eruptions, tsunamis, landslides, floods, hurricanes, fires, and asteroid impacts and their interactions and implications with human society in the U.S. and globally.
23	Earth System Science	EARTHSS 19	Introduction to Modeling the Earth System	Simulate the Earth's system using computer models. Covers the interaction of the air, land, and ocean, and explores how changes to one part of the environment affect the complete Earth system. Utilizes technological tools to understand scientific principles.

24	Earth System Science	EARTHSS 21	On Thin Ice: Climate Change and the Cryosphere	Introduction of the basic science that governs the cryosphere and its interaction with the climate system. Covers some of the significant economic, sociological, and political consequences of the recent melting of the cryosphere driven by anthropogenic climate change.
25	Earth System Science	EARTHSS 51	Land Interactions	The role of terrestrial processes in the Earth system. Provides an introduction to ecosystem processes that regulate the cycling of energy, water, carbon, and nutrients. Analysis of the impact of human activities.
26	Earth System Science	EARTHSS 53	Ocean Biogeochemistry	Overview of oceanography for those interested in earth system science. Focus is on physical, chemical, and biological processes that drive biogeochemical cycling in the oceans. Coastal systems also reviewed, with emphasis on California waters.
27	Earth System Science	EARTHSS 55	Earth's Atmosphere	Composition, physics, and circulation of Earth's atmosphere with an emphasis on explaining the role of atmospheric processes in shaping the climate system. Topics include: atmospheric composition, the global energy balance, radiative transfer and climate, atmospheric circulation and climate sensitivity.
28	Earth System Science	EARTHSS 60C	Global Environmental Issues	An overview of global environmental changes including climate change, sea level rise, biodiversity loss, land and ocean degradation, and resource depletion. Discusses scientific, cultural, historical, and policy dimensions of these issues as well as possible solutions.

29	Earth System Science	EARTHSS H90	The Idiom and Practice of Science	A series of fundamental and applied scientific problems are addressed, illustrating the pervasive role of mathematical analysis. Topics may include energy utilization, the climate system, the "greenhouse effect," ozone depletion and air pollution, ecological consequences of water pollution, nutrient cycles.
30	Earth System Science	EARTHSS 110	Environmental Controversies	Examines the roles and strategies of advocacy groups, scientists, lobbyists, celebrities, pundits, politicians, and other opinion-makers in creating and shaping public opinion on controversial environmental issues. Use and misuse of science to influence public opinion is elicited.
31	Earth System Science	EARTHSS 146	Consequences of Air Pollution	From public health to the global climate system this course will explore the impacts of air pollution from the beginning of human history to current and emerging issues. Scientific concepts behind air pollution and solutions will be discussed.
32	Earth System Science	EARTHSS 164	Ecosystem Ecology	A mechanistic perspective on ecosystem processes. Covers ecosystem development, element cycling, and interactions with plants and microbes. The role of ecosystems in environmental change is also addressed.
33	Earth System Science	EARTHSS 168	Physiological Plant Ecology	An examination of the interactions between plants and their environment. Emphasis on the underlying physiological mechanisms of plant function, adaptations and responses to stress, and the basis of the distribution of plants and plant assemblages across the landscape.

34	Earth System Science	EARTHSS 174	Ice in the Climate System	Examines the major components of the Earth's cryosphere. Characteristics, volume, extent, remote sensing observations, long-term trends, mass balance, key physical processes, relevance and importance to the climate system, responses and feedbacks, future evolution, and key uncertainties will be discussed.
35	Economics	ECON 143	Energy Economics	The economics of markets of oil, natural gas, electricity, renewable energy and their interactions with each other and the rest of the economy. Effects of government intervention, policy measures, economic policy issues arising between energy use and the environment.
36	Economics	ECON 152A	Economic Anthropology	Economic systems in comparative perspective: production, distribution, and consumption in market and non-market societies; agricultural development in the third world.
37	Economics	ECON 157	Economic Development	Considers the process of economic development across the globe and why some countries are rich and others poor. Discusses the major problems facing developing countries, such as population growth, education, capital formation, environmental protection, and international trade.
38	History	HISTORY 12	Native American Religions and Environmental Ethics	Sustainability-related description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
39	History	HISTORY 21C	World Since 1870 / World-War & Rights	Considers several major currents of modern history: technological change and its social effects; changes in gender relations; totalitarianism; peasant revolutions and the crisis of colonization; international migration; and ecological problems.

40	History	HISTORY 100W	History & American West; Climate and Global Warming	Sustainability-related description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
41	History	HISTORY 190	Nature, Environment, and Modern Europe	Sustainability-related description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
42	Informatics	IN4MATX 161	Social Analysis of Computerization	Introduction of computerization as a social process. Examines the social opportunities and problems raised by new information technologies, and the consequences of different ways of organizing. Topics include computerization and work life, privacy, virtual communities, productivity paradox, systems risks.
43	International Studies	INTL ST 183E	Conflict Management in Cross-Cultural Perspective	Examines theories of conflict management. Analyze how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.
44	Management	MGMT 10	Business and Management in the World Today	Accounting scandals, e-commerce, and globalization are only a few examples that show the profound impact of business practices on individuals and on society at large. Provides students with a broad overview of business functions and management practices.
45	Planning, Policy & Design	PP&D 4	Introduction to Urban Studies	Introduces the substantive areas, concepts, and tools in the field of urban studies. Acquaints students with physical, environmental, social, economic, and political dimensions of cities. Examines the challenges facing cities, including poverty, sustainability, development, globalization, and others.



46	Planning, Policy & Design	PP&D E8	Introduction to Environmental Analysis and Design	Overview of general concepts, theoretical principles, and analytical techniques for investigating environmental systems. Integrates tools from natural and social sciences to analyze contemporary environmental challenges such as pollution, resource acquisition, facility and ecosystem design, impact assessments, formulation of environmental policy.
47	Planning, Policy & Design	PP&D 40	Urban Sociology	Overview of theoretical, substantive, and policy issues in urban sociology. History of urbanization, the school of human ecology, and recent trends regarding urbanism. Time is devoted to understanding the causes and possible solutions to urban problems.
48	Planning, Policy & Design	PP&D 100	Food and Eating	Sustainability-related description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.
49	Planning, Policy & Design	PP&D 107	Urban and Regional Planning	Important substantive areas, concepts, tools in the field of urban and regional planning. Topics include: forces that have historically guided and are currently guiding U.S. urbanization; land use, economic development, housing and community development, environmental planning; legal, environmental, governmental context.
50	Planning, Policy & Design	PP&D 113	Poverty in Developing Countries	Focuses on poverty in developing countries. Analyzes the magnitude and changing nature of poverty in the global south. Critically examines poverty conceptualized in terms of economic deprivation, well-being, and social exclusion.

51	Planning, Policy & Design	PP&D 151	Environmental Psychology	Impact of the physical environment of individual and group behavior. Three basic concerns examined: (a) environmental determinants of behavior at the individual and interpersonal level; (b) social planning and urban design; (c) methodological approaches to the study of environmental issues.
52	Planning, Policy & Design	PP&D 153	Elements of Environmental Design	Basic elements of environmental design such as scale, population, rhythm, color, sound, lighting, surface, texture, architectural definition of spaces, volumes, massing volumetric analysis, solids and voids, and cultural aspects of design. Excitement and creativity in design, imageability.
53	Planning, Policy & Design	PP&D 155	Urban Design Principles	Introduction to principles of urban design and its applications. Study of contemporary and traditional theories of urban design formulated to improve physical characteristics of built environment to facilitate an enhanced quality of life. A variety of case studies are discussed.
54	Political Science	POL SCI 154G	Conflict Management in Cross-Cultural Perspective	Examines theories of conflict management. Analyze how conflict is mitigated in diverse cultures: at the interpersonal level, between groups and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.
55	Psychology and Social Behavior	PSB 171S	Environmental Psychology	Impact of the physical environment on individual and group behavior. Three basic concerns examined: (a) environmental determinants of behavior at the individual and interpersonal level; (b) social planning and urban design; (c) methodological approaches to the study of environmental issues.

56	Public Health	PUBHLTH 60	Environmental Quality and Health	A survey of how pollution in the natural and physical environment affects human health. Topics are toxicology, epidemiology, risk assessment, water, food, air, radiation, pesticides, solid and hazardous waste. Included are interdisciplinary elements of environmental regulations, environmental education, consumer protection.
57	Public Health	PUBHLTH 151	Environmental Psychology	Impact of the physical environment on individual and group behavior. Three basic concerns examined: (a) environmental determinants of behavior at the individual and interpersonal level; (b) social planning and urban design; (c) methodological approaches to the study of environmental issues.
58	Public Health	PUBHLTH 161	Environmental Geology	Introduction to geologic principles and applications to environmental problems. Topics include: tectonic processes, earth materials, soils, river processes, groundwater, the coastal environment, slope failures, seismic hazards, mineral resources, and land-use evaluation based on geologic conditions. Examples from case studies.
59	Public Health	PUBHLTH 169	Human Exposure Modeling	Indirect methods in estimating human exposure to environmental agents. Topics include air, noise, dermal and ingestion exposure assessment, time-activity and micro-environmental approach, uncertainty and variability analysis, and the use of GIS and remote sensing in exposure assessment.
60	Public Health	PUBHLTH 179	Special Topics in Environmental and Global Health Science	Studies in selected areas of environmental and global health sciences. Topics addressed vary each quarter.

61	Social Ecology	SOCECOL E8	Introduction to Environmental Analysis and Design	Overview of general concepts, theoretical principles, and analytical techniques for investigating environmental systems. Integrates tools from natural and social sciences to analyze contemporary environmental challenges such as pollution, resource acquisition, facility and ecosystem design, impact assessments, formulation of environmental policy.
62	Social Ecology	SOCECOL 10	Environmental Geology	An introduction to the logic behind and methods of designing and conducting research studies in Social Ecology. Topics include how to measure variables of interest, identifying causal relationships, sampling, survey research methods, experiments, quasi-experimental designs, and ethics in research. Course may be offered online.
63	Social Science	SOC SCI 5A	Introduction to Human Geography	Human behavior in a geographical context. Spatial patterns and organization of the cultural, social, and economic activities of man as imposed on and influenced by the earth's physical setting.
64	Social Science	SOC SCI 5D	U.S. and World Geography	Survey of general geographical principles and facts on a world scale, as well as introduction to the broad regional and resource geography of the U.S., emphasizing in particular the interactions of physical and cultural factors.
65	Social Science	SOC SCI 118G	Regional Geography of California	Geographical analysis of selected regions of California, in particular geomorphological, hydrological, and climatic conditions, as well as economic and social strengths and weaknesses. May include some fieldwork in Orange County on environmental, social and residential problems, with legislative background information.
66	Social Science	SOC SCI 119	Geography of Global Economy	Studies in selected areas of geography. Topics addressed vary each quarter.

67	Social Science	SOC SCI 183E	Conflict Management in Cross-Cultural Perspective	Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations.
68	Sociology	SOCIOL 2	Introduction to Sociology	Examines globalization and international issues from the perspective of sociology and related fields. Issues include economic globalization and global inequality, international environmental problems, international politics, trends in global culture, and global conflict.
69	Sociology	SOCIOL 3	Introduction to Social Problems	Focuses on how institutional and organizational features of societies generate problems for people. Particular attention directed at a set of problems related to political and economic inequality: poverty, racism, sexism, urban and population problems, the environment, the criminal justice system.
70	Sociology	SOCIOL 43	Urban Sociology	Examines nature, causes, and consequences of urbanization along with changing scale and complexity, demographic/ecological city growth patterns, quality of life in urban areas, processes of decision-making, and bearing of sociological investigation on public policy concerns in contemporary urban society.
71	Sociology	SOCIOL 44	Population	Introduction to the analysis of human population including fertility, mortality dispersion, sex distribution. Attention is focused on the effects of these variables on over-population, social disorganization, and the stability of social institutions.
72	University Studies	UNI STU 41	Global Village Seminar	Issue-oriented course to engage students in examining perspectives and narratives surrounding current global issues.

## SUSTAINABILITY-RELATED COURSES

	DEPARTMENT	COURSE NO.	COURSE NAME	COURSE DESCRIPTION
<b>GRADUATE COURSES</b>				
1	Chemistry	CHEM 245	Atmospheric Chemistry of the Natural and Polluted Troposphere	Kinetics, mechanisms and photochemistry of tropospheric reactions in the gas, liquid, and solid phases, and methods of analysis. Chemistry of photochemical oxidant formation and acid deposition, and applications to control strategies. Chemistry of toxic chemicals and indoor air pollution.
2	Civil and Environmental Engineering	ENGRCEE 261	Applied and Environmental Microbiology	Microbes in the environment and their impact on human interactions. Microbiological application in solving environmental engineering problems.
3	Civil and Environmental Engineering	ENGRCEE 263	Advanced Biological Treatment Processes	Analysis of biological processes in natural and engineered systems. Biological treatment processes, both aerobic and anaerobic, with emphasis on suspended growth systems including design consideration. Containment degradation or control covered. Includes laboratory on molecular tools used in wastewater treatment.
4	Civil and Environmental Engineering	ENGRCEE 265	Advanced Physical-Chemical Treatment Processes	Theory and dynamics of physical and chemical separation processes in water and wastewater treatment. Topics include coagulation, sedimentation, filtration, gas transfer, membrane separations, and absorption.
5	Civil and Environmental Engineering	ENGRCEE 266	Biotechnology of Wastewater	Water and wastewater microbiology. Engineering principles, molecular aspects, and overview of microorganisms of importance to public health. Topics include aerobic and anaerobic wastewater treatment and disinfection of pathogens in water, wastewaters, and biosolids.

6	Civil and Environmental Engineering	ENGRCEE 272	Groundwater Hydrology	Topics include conservation of fluid mass, storage properties or porous media, matrix compressibility, boundary conditions, flow nets, well hydraulics, groundwater chemistry, and solute transport. Includes introduction to advanced topics in porous media. Design projects and computer applications included.
7	Civil and Environmental Engineering	ENGRCEE 273	Watershed Modeling	Basic principles of hydrologic modeling are practiced. Concepts of watershed delineation, land use change impact, design studies, and GIS tools are discussed. Focus on the USACE (HEC) software tools (HEC-HMS, and HEC-RAS) along with their associated GIS interfaces.
8	Civil and Environmental Engineering	ENGRCEE 276	Hydrology	Elements of the hydrologic cycle including precipitation, infiltration, evapotranspiration, ground water, and runoff. Unit Hydrograph theory and routing methods. Introduction to precipitation/runoff relationship and watershed modeling. Statistical methods and flood frequency analysis. Discussion section covers advanced topics.
9	Civil and Environmental Engineering	ENGRCEE 289	Analysis of Hydrologic Systems	Application of systems theory in hydrologic, land surface, biogeochemical modeling. Design, identification, and calibration of conceptual models. Principles of dynamic systems, modeling approaches, theory of linear systems, mathematical concepts of differential calculus, theoretical concepts of parameter estimation and optimization theory.

10	Criminology, Law, and Society	CRM/LAW C207	Development Control Law and Policy	Investigates legal and institutional frameworks for development control. Review of constitutional issues implicated in land-use regulation. Traces development control historically and analyzes contemporary approaches to land-use control which reflect environmental and economic development concerns.
11	Criminology, Law, and Society	CRM/LAW C252	Environmental Law & Policy	Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists.
12	Earth System Science	EARTHSS 212	Geoscience Modeling and Data Analysis	Computer-based course. Fundamental statistical techniques needed to analyze Earth system data and models. Basic numerical techniques to solve Earth system models. Focuses on linear and non-linear ordinary differential equations, as well as simple partial differential equations.
13	Earth System Science	EARTHSS 232	Terrestrial Hydrology	Comprehensive treatment of modern conceptual and methodological approaches to hydrological science. Combines qualitative understanding of hydrological processes with quantitative representation, approaches to measurement, and treatment of uncertainty. Components of the hydrological cycle and their linkages within the coupled Earth system.
14	Earth System Science	EARTHSS 240	Atmospheric Chemistry and Physics	Examines the physical/chemical processes which determine the structure and composition of Earth's atmosphere and its role in the climate system.



15	Earth System Science	EARTHSS 266	Global Biological Change	Global biogeochemical cycling of the elements. Topics include global cycling of carbon, nitrogen, oxygen, and sulfur; impact of human activities on biogeochemical processes.
16	Earth System Science	EARTHSS 268	Physiological Plant Ecology, Graduate level	An examination of the interactions between plants and their environment. Emphasis on the underlying physiological mechanisms of plant function, adaptations and responses to stress, and the basis of the distribution of plants and plant assemblages across the landscape.
17	Earth System Science	EARTHSS 282A	Special Topics in Climate	Each quarter is devoted to in-depth analysis of an important and rapidly developing area in the field of climate dynamics. Topics addressed vary each quarter.
18	Earth System Science	EARTHSS 286A	Special Topics in Biogeochemistry	Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. Topics addressed vary each quarter.
19	Earth System Science	EARTHSS 286B	Special Topics in Biogeochemistry	Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. Topics addressed vary each quarter.
20	Earth System Science	EARTHSS 290	Seminar	Weekly seminars and discussions on topics of general and current interest in Earth System Science. Topics addressed vary each quarter.
21	Earth System Science	EARTHSS 298	Practicum in Earth System Science	Designed to introduce first-year graduate students to research. Students explore research opportunities and develop a proposal for a summer research project under the direction of a faculty mentor.
22	Earth System Science	EARTHSS 299	Research	Supervised original research in areas of Earth System Science.
23	Law	LAW 5657	Animal Law	Sustainability-related description of this course has been determined by faculty to meet criteria for Sustainability Majors/Minors.

24	Management	MGMT FE 206	Business and Government	Introduces students to the many non-market issues that affect today's managers, such as: environmental protection, health and safety, intellectual property protection, antitrust, and lobbying. An interdisciplinary approach using economics, political science, public policy and law.
25	Management	MGMT MBA 206	Business and Government	Introduces students to the many non-market issues that affect today's managers, such as: environment protection, health and safety, intellectual property protection, antitrust, and lobbying. Takes an interdisciplinary approach using economics, political science, public policy and law.
26	Mechanical and Aerospace Engineering	ENGR MAE 214	Fuel Cell Fundamentals and Technology	Fuel-cell systems design, operation, and materials. Electrochemistry and electrocatalysis, cell degradation, nature of fuel-cell electrodes and electrolytes, fuels, and fuel processing. Provides broad insight into fuel-cell science, technology, system design, and operation.
27	Mechanical and Aerospace Engineering	ENGR MAE 261	Air Quality Modeling	Fundamental principles necessary to understand the dynamics of air pollutants. Derivation and description of mathematical techniques for the numerical solution of the atmospheric equation. Formulation and development of air quality models.
28	Planning, Policy & Design	PP&D 207	Development Control Law and Policy	Investigates legal and institutional frameworks for development control. Review of constitutional issues implicated in land-use regulation. Traces development control historically and analyzes contemporary approaches to land-use control which reflect environmental and economic development concerns.

29	Planning, Policy & Design	PP&D 235	Geographic Information Systems (GIS) Problem Solving in Planning	Explores the application of geographic information systems (GIS) in urban planning. Steps through a GIS-based planning procedure that balances housing, jobs, tax base, utilities, transportation, and the natural environment.
30	Planning, Policy & Design	PP&D 244	Land-Use Policy	Examination of the role of public policy in guiding growth and development in urban and suburban environments. Description of a wide-ranging set of growth policies, the rationales underlying their use, controversies and legal constraints, and evaluation of their effectiveness.
31	Public Health	PUBHLTH 278	Industrial Toxicology	Analysis of responsibilities toxicologists have in industry, including product safety generating material safety, data sheets, animal testing, ecotoxicological testing, risk/hazard communication, and assisting industrial hygienists and occupational physicians; emphasis on interdisciplinary nature of industrial toxicology and communication skills.