UC Davis / STARS 2.0 Purple courses are cross-listed

AC 1: Academic Courses Timeline: 2010-2011, 2011-2012, 2012-2013

SUSTAINABILITY COURSES

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Irrigation Practices for an Urban Environment	ABT 165	Applied Biological Systems Technology	U	Basic design, installation, and operation principles of irrigation systems for turf and landscape: golf courses, parks, highways, public buildings, etc. Emphasis on hardware association with sprinkler and drip/trickle systems.	W11, W12, W13	
Agricultural & Environmental Education	AED 100	Agricultural Education	U	Philosophy and nature of formal and non-formal agricultural and environmental education programs. Emphasis on understanding the role of the teacher and observing a variety of programs.	W11, W12, W13	
Nature & Culture	AMS 001E	American Studies	U	Uses and abuses of nature in America; patterns of inhabitation, exploitation, appreciation, and neglect; attention to California; emphasis on metaphor as a key to understanding ourselves and the natural world; attention to models of healing: stewardship, ecology, the "rights" movement.	S11, S12, S13	
Introductory Aquaculture	ANS 018	Animal Science	U	Historical and contemporary aquacultural practices. Interaction between the aqueous culture environment and the biology of aquatic animals. Impact of economics and governmental policies on the development of aquaculture. Interaction of aquacultural practices with larger societal goals.	F11, F12	
Sustainable Animal Agriculture	ANS 112	Animal Science	U	Current applications of sustainable animal agriculture including the challenges of animal production, animal needs, animal well-being, and protection of the environment and resources for future food supply systems. Various scenarios for meeting sustainability objectives are evaluated using computing modeling.	S12, S13	
Environmental Stewardship in Animal Production Systems	ANS 129	Animal Science	U	Management principles of environmental stewardship for grazing lands, animal feeding, operations and aquaculture operations; existing regulations, sample analyses, interpretation and utilization of data, evaluation of alternative practices, and policy development.	W11, W13	
Ecology, Nature, Society	ANT 101	Anthropology	U	Interdisciplinary study of diversity and change in human societies, using frameworks from anthropology, evolutionary ecology, history, archaeology, psychology, and other fields. Topics include population dynamics, subsistence transitions, family organization, disease, economics, warfare, politics, and resource conservation. From ASI course list: Interdisciplinary study of diversity and change in human societies, using frameworks from anthropology, evolutionary ecology, history, archaeology, psychology, and other fields. Topics include population dynamics, subsistence transitions, family organization, disease, economics, warfare, politics, and resource conservation.	W11, S12	ESP101
Indigenous Peoples and Natural Resource Conservation	ANT 103	Anthropology	U	Integration of the interests of resident and indigenous peoples with the conservation of natural resources and ecosystems, using case study examples from both the developing and developed world. Course covers: Contrasting views on the policies required to deal with the potential sociopolitical instabilities arising from ecological degradation, as represente by ecologists and economists. Specific focus on various ideologies of development, such as protectionism, sustainability, multiple use, and comanagement; Theoretical introduction to relevant ideas in anthropology, behavioural ecology, ecology and economics, including a) the concept of what is "natural", b) political ecology, c) adaptationism, and d) common property theory; Case studies from at least four continents that explore a specific ecological problem, its historical and cultural roots, the varying attempts at solution, and the reasons for successes and failures. Emphasis on the varying and conflicting viewpoints of the contenders.; Review of case studies leading to discussions of new directions in conservation and development, such as intermediate technology, extractive reserves, scale, role of women in development, and participatory research. Links to conservation movements and environmental politics in industrial nations will be examined.	S11, F12	
Cultural Politics of the Environment	ANT 104N	Anthropology	U	Political economy of environmental struggles. Relationship between social inequality (based on race, class and/or gender) and ecological degradation. Articulation of local peoples, national policy, and the international global economy in the contestation over the use of environmental resources.	F11, S13	
Ecology and Politics	ANT 131	Anthropology	U	Analysis of the complex interactions between ecological dynamics and political processes employing the emerging approach of political ecology. Case studies of environmental degradation (e.g., desertification, logging, mineral extraction, petroleum, water) from various cultural and geographic regions.	SS-1 2010, S12,	

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Cultural Ecology	ANT 211	Anthropology	G	Topics of current analytical and methodological importance in cultural ecology. Examination of general issues in cultural ecology through study of human response to and influence on climate. Course covers sustainability and natural resources in different production systems and different historical periods.	S11	ECL 211
Population, Environment and World Agriculture	ARE 015	Agricultural & Resource Economics	U	Economic analysis of interactions among population, environment, natural resources and development of world agriculture. Introduces students to economic thinking about population growth, its causes and consequences for world food demand, and environmental and technological limits to increasing food supplies.	W13	
Economics of Agricultural Sustainability	ARE 121	Agricultural & Resource Economics	U	Application of economic concepts to agro-environmental issues relevant to agricultural sustainability. Topics include market efficiency, production externalities, government policies, agricultural trade, product differentiation, all linked to sustainability issues. Case studies include biofuels, genetically modified foods and geographically differentiated products.	S11, S12, S13	
Resource and Environmental Policy Analysis	ARE 147	Agricultural & Resource Economics	U	Natural resource use problems with emphasis on past and current policies and institutions affecting resource use; determinants, principles, and patterns of natural resource use; property rights; conservation; private and public resource use problems; and public issues.	W11, S12, W13	
Resource and Environmental Policy Analysis	ARE 147M	Agricultural & Resource Economics	U	Natural resource use problems with emphasis on past and current policies and institutions affecting resource use; determinants, principles, and patterns of natural resource use; property rights; conservation; private and public resource use problems; and public issues.	W11, S12, W13	
Natural Resource Economics	ARE 175	Agricultural & Resource Economics	U	Economic concepts and policy issues associated with natural resources, renewable resources (ground water, forests, fisheries, and wildlife populations) and non-renewable resources (minerals and energy resources, soil).	S11, S12, S13	ESP 175
Environmental Economics	ARE 176	Agricultural & Resource Economics	U	Role of the environment in economic activity and methods for protecting and enhancing environmental quality; implications of market failures for public policy; design of environmental policy; theory of welfare measurement; measuring the benefits of environmental improvement.	F10, F11, F12	
Applied Microeconomics 2	ARE 202C	Agricultural & Resource Economics	G	Methods of applied welfare economics with emphasis on problems arising in agriculture and the environment. Models of imperfectly competitive markets and their application to industries and institutions in the agricultural sector.	S11, S12, S13	
Economic Analysis of Resource and Environmental Policies	ARE 275	Agricultural & Resource Economics	G	Development of externality theory, market failure concepts, welfare economics, theory of renewable and non-renewable resource use, and political economic models. Applications to policy issues regarding the agricultural/environment interface and managing resources in the public domain.	S11, S12, S13	
Environmental Economics	ARE 276	Agricultural & Resource Economics	G	Applications of externality theory to the design of efficient environmental policies. Evaluation of pollution control policy instruments in light of information limitations and market imperfections. Methods for nonmarket valuation of the benefits of environmental improvement.	F11, S12, W13	
Natural Resource Economics	ARE 277	Agricultural & Resource Economics	G	Application of capital theory and dynamic methods to issues of optimal use of renewable and nonrenewable resources. Examination of policy issues associated with forests, fisheries, groundwater, energy resources, watersheds, soil, global climate, and wildlife.	S11, S12, S13	
Global Climate Change	ATM 005	Atmospheric Science	U	Scientific concepts needed to understand climate and climate change. Principles of regional variations in climate. Understanding observed seasonal, decadal and millennial changes. Analysis of the Antarctic ozone hole, El Nino and human-induced global warming.	W11, S13	
Fundamentals of Atmospheric Pollution	ATM 006	Atmospheric Science	U	Effects of human emissions on the atmosphere: smog, ozone pollution, and ozone depletion; indoor air pollution; global warming; acid rain. Impacts of these problems on the earth, ecosystems, and humans. Strategies to reduce atmospheric pollution.	F10, F11, F12	
Climate Change	ATM 116	Atmospheric Science	U	Climate trends and patterns spanning the recent past and the future. Emphasis on natural processes that produce climate variations and human influence on these processes. Evidence of climate change and the role of global climate models in understanding climate variability.	S11	

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Gateways to Emergence in Science and Society: Toward a Science of Sustainability	CHE 298	Chemistry	U	The aim of this course is to provide students with the tools they need to develop an emergent perspective on problems in science and society by focusing on gateways to emergent behavior we have identified in the physical and biological sciences and on gateways that have been proposed for solving some of our major societal problems. This new course in an experiment, stressing interdisciplinary and integrative learning at the upper undergraduate and graduate level. There are several aspects to the experiment: the topic of emergence as a unifying principle bringing together students in different sciences; the emphasis on emergent global problems and the science needed to assure clean, secure, and sustainable energy and food supplies to power and stabilize our world; the integration of high-profile guest lecturers who will also participate in other campus activities; and grading based on a website created by each student. This experiment will set the stage for other innovative, rigorous, and adventurous intellectual experiences for UC Davis students.	W12	PHY 150
The Internet as a Medium for Education about Science and Sustainability	CHE 298	Chemistry	G	Students will collaborate to create interactive multimedia in a studio setting. The topic: the science and technology of sustainability. The audience: middle to high school students. The approach: emergent, with the form and content generated through the interaction among the students, faculty and visitors. Our challenge will be to make "digital native" works exploiting the unique potential of the medium. We must develop an integration of content and form, combining elements of text, image, sound, video and animation in a networked architecture. We must communicate effectively in the non-linear, user-directed forum of the internet. Students will develop STEM outreach materials on the science and technology of sustainability, climate change and the environment that will expand and complement the activities of the Wolf Ridge Environmental Learning Center (see, for example, their climate change manual), LabRats and other middle and high school science programs.	W12	TCS 198
Indigenous Healing & Biodiversity in Latin America	CHI 147S	Chicana/Chicano Studies	U	Contrast between western and traditional healing practices in Latin America and the role of the natural environment in creating sustainable health delivery systems. Questions of health status attributable to public health and environmental risk factors.	F10, F11, F12	
Food Systems	CRD 020	Community & Regional Development	U	Social aspects of agri-food systems. Social science perspectives applied to food, agriculture, and sustainability in relation to power, labor, knowledge, technology, governance, and social movements. Discussions of specific commodity chains and their social and environmental effects in comparative global context.	F10, F11, F12	
Rural Change in the Industrialized World	CRD 142	Community & Regional Development	U	The objective of the course is to help students understand a range of important social, environmental, and agricultural issues in rural areas in the industrialized world, and their interconnected nature. We give special emphasis to historical and recent transformations in rural areas, commonly referred to as "rural restructuring," and to the idea and practice of sustainable development. Changes in rural areas of industrialized countries commonly consists of agricultural consolidation, rural industrialization, the shift from primary production to increased employment in services and alternative economic activities, an influx of migrants from urban areas to rural areas in some areas and continued depopulation in other areas, devolution of governance to the local level, the establishment of protected areas and other forms of environmental protection, and a movement of productivist agriculture toward direct sales, agritourism, ecological entrepreneurship, and other strategies. The four sections of the course examine (1) contemporary rural restructuring and many important processes contributing to contemporary rural change in industrialized nations; (2) the profound changes that have occurred and are currently occurring in agriculture and food systems; (3) the relationship between society and environment in rural areas, including 1 environmental conservation, environmental governance, alternative energy, and environmental justice; and (4) responses to rural restructuring, including policy and planning.	W11, SS-1 2011, SS-1 2012	

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Youth/Community Development: Going Global	CRD 147	Community & Regional Development	U	Community influences on youth well-being, youth as agents of community change, and policies to support healthy communities for young people. Special emphasis on disparities in youth well-being related to race, class, immigration status, gender, sexual-orientation. This course is intended to help students develop a critical understanding of the ways that community, regional, and global settings influence youth well-being and how youth can serve as agents of community change. This year, the course will focus specifically on the relationships between youth well-being and global climate change. This course has three basic learning goals. 1. To deepen students' critical reflection on their own community/ youth development experiences; 2. To introduce students to a broad range of perspectives on community/ youth development from the academic literature and practitioner sectors; 3. To help students explore the ways in which climate change impacts young people and what actions young people are taking to confront these changes.	S13	
Community Development Perspectives on Environmental Justice	CRD 149	Community & Regional Development	U	Environmental justice social movements address inequitable distribution of pollution on low-income communities of color. This course explores the histories, policies, and innovations associated environmental justice movements in the United States and around the world. Special attention will be placed on the connections between environmental justice and other social movements such as regional equity and health equity. Key topics will include: public policy responses to environmental injustices; the roles of science and scientists in environmental justice conflicts; connections between environmental justice and community development theories, policies and practices. Primary research using Photovoice and other participatory methods will be used to directly engage students in the relevant issues and communities. Readings will be drawn from social movement theory, political ecology, and science and technology studies. Guest lectures from leaders in environmental justice movements will complement lectures, class discussions, and project work.	S12	
Political Ecology of Community Development	CRD 244	Community & Regional Development	G	This course explores the interactions of communities with their biophysical environment through the lens of geographical political ecology. Political ecology integrates political economic analysis and environmental sciences across multiple scales to analyze the dynamic relationships between society and land-based resources, and environmental outcomes resulting from the interactions between and within social groups. The framework of political ecology is used in the course to understand communities that depend directly upon production activities such as agriculture, forestry, mining, and fishing, and also to explore the linkages between nature and society in urban and suburban areas. The course explores the place of social theory, ecological thought, development, and first world/third world distinctions in political ecology. Cases focus on the intersection of knowledge, power, and community in transformations of nature and include debates over development, social organization and environmental outcomes, environmental justice, the role of citizens in scientifically informed decision making processes about environmental management, the potential of markets for environmental goods and services, and biodiversity conservation through community-based conservation.	W12	
Food Systems Analysis	CRD 298	Community & Regional Development	G	This food system analysis course links the conceptual and practical considerations of system analysis and develop a base of resources and tools for emerging practitioners. We will explore the process of food system assessment with an emphasis on: - Analyzing the relationships among the environment, food supply, markets, American diets and the health of consumers and critically explore the influences on those relationships in the food system. - Reviewing various conceptual frameworks for analyzing the food system from different perspectives. - Comparing and contrasting different methods for analyzing the sustainability of different food system sectors. - Identifying key leverage points in the food system and how they might be influenced to affect positive change. - The course format will include student-led discussion, guest presentations and panels, and will highlight developing the practical skills to conduct a food systems assessment. To develop their own tools for analysis, students will select and critically analyze one regional food system assessment in the US and then build on the strengths, weaknesses, and gaps in the existing approach to outline a design for a food system assessment in Yolo County.	W11	IAD 298

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Sustainable Design	DES 127A	Design	U	Principles, practice and materials of contemporary sustainable design in the context of environmental crisis. History of sustainable design in relation to the fields of textiles, visual communication, interior architecture, exhibition design and lighting.	W11, W12, W13	
Studio Practice in Sustainable Design	DES 127B	Design	U	Analysis and practice of sustainable design within studio context. Design project that incorporate the reuse of post consumer waste; standard materials vs. sustainable materials; Cradle to Cradle philosophy and practice; biomimicry; Life Cycle Analysis. Required field trips.	S11, S12, S13	
Science and Technology of Sustainable Power Generation	EAD 188	Applied Science Engineering	U	Focus on scientific understanding and development of power generation that is the basis of modern society. Concentration on power generation methods that are sustainable, in particular, discussion of the most recent innovations. 1) Introduction to the basic principles of power production; 2) the study of the latest innovations in sustainable power production; 3) environmental impacts of the power production method; 4) economic consequences of the production methods; 5) Globalization of the production methods.	F10, W12	
Renewable Bioprocessing	EBS 267	Biological & Agricultural Engineering	G	Applications of biotechnology and bioprocess engineering toward the use of agricultural and renewable feedstocks for the production of biochemicals. Design and modeling of microbial- and plant-based production systems including associated fermentation, extraction, and purification processes.	F10, F12	
Process Economics and Green Design	ECH 158A	Chemical Engineering	U	Senior design experience in process and product creation and design with multiple realistic constraints. Cost accounting and capital investment estimation. Profitability analysis techniques. Green chemistry, health risk assessment and life cycle assessment concepts. Course holistically covers five main topics: I. The Design Process, II. Capital Investment Estimation, III. Total Product Cost Estimation, IV. Green Design (including life cycle assessment), and V. Evaluating Alternatives.	F12	
Urban Systems and Sustainability	ECI 123	Civil & Environmental Engineering	U	Systems-level approach of how to evaluate and then modify sustainability of urban systems based on interaction with natural environments. Topics include: definition/metrics of urban sustainability; system analyses of urban systems; enabling technology, policies, legislation; measures and modification of ecological footprints.	W11, W12, W13	
Building Energy Performance	ECI 125	Civil & Environmental Engineering	U	Mechanisms of energy consumption in buildings including end uses, thermal loads, ventilation, air infiltration, thermal energy distribution, and HVAC systems; energy performance simulation; methods and strategies of energy efficiency.	W11, W12, W13	
Integrated Planning for Green Civil Systems	ECI 126	Civil & Environmental Engineering	U	Working within multidisciplinary teams and a heuristic learning environment, an integrated design process will be applied to the planning of a project-based green and sustainable civil system. 1. Introduction-Sustainability and Society; 2. Impact of the Built Environment; 3. Theory and Methods of Design; 4. Integrated Design Process; 5. Vernacular Architecture; 6. Passive Solar Design; 7. Site Analysis and Selection; 8. Materials; 9. Building Envelope; 10. Lifecycle Analysis; 11. Energy Systems; 12. Water Systems; 13. Waste Systems; 14. Living Laboratory; 15. Commissioning; 16. Green Building Policy and Certifications	W12	
Integrated Design for Green Civil Systems	ECI 127	Civil & Environmental Engineering	U	Working within multidisciplinary teams and a heuristic learning environment, an integrated design process will be applied to the design of a project-based green and sustainable civil system.	S11, S12	
Green Engineering Design and Sustainability	ECI 143	Civil & Environmental Engineering	U	Application of concepts, goals, and metrics of sustainability, green engineering, and industrial ecology to the design of engineered systems. Life-cycle analyses, waste audit and environmental management systems, economics of pollution prevention and sustainability, and substitute materials for products and processes.	F10, F11, F12	
Hydraulic Structure Design	ECI 145	Civil & Environmental Engineering	U	Project-based course covering the design of an integrated urban drainage system, including consideration of design alternatives, multiple realistic constraints (public safety, economic, environmental, sustainability and health), quantification of hydrologic uncertainty, codes and standards, design drawings and specifications and cost analysis.	S11, S13	
Water Resources Engineering Planning	ECI 155	Civil & Environmental Engineering	U	Basic engineering planning concepts; role of engineering, economic, environmental and social information and analysis; institutional, political and legal aspects. Case studies and computer models illustrate the planning of water resource systems. 1. Overview of Water Resource Planning Problems and Systems; 2. Hydrology for System Management; 3. Physical Infrastructure for Water Management; 4. Institutional Infrastructure for Water Management; 5. System Yield Modeling; 6. Water uses and their forecasting, management, and modeling; 7. Integrated System Modeling; 8. Water Resources Management; 9. Planning Theory; 10. Tests	S12, S13	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Transportation Land Use Sustainable Design	ECI 162	Civil & Environmental Engineering	U	Interactions between land use and transportation systems design. Generalized design paradigm; group problem solving. I. Localized Impact Analysis and Sustainable Design: sustainability performance measures, demand analysis, accident analysis, supply analysis, air quality impacts, climate change impacts; II. Transportation Planning: goals and objective, travel demand modeling, sketch planning, sustainable evaluation measures; III. Transport Facility Design: roadway design features, sight distance, access control, alternative mode systems, elasticities and mode shifts, project programming and priortization	S11, S12, S13	
Energy and Environmental Aspects of Transportation	ECI 163	Civil & Environmental Engineering	U	Engineering, economic, and systems planning concepts. Analysis and evaluation of energy, environmental and selected environmental attributes of transportation technologies. Strategies for reducing pollution and petroleum consumption in light of institutional and political constraints. Evaluation of vehicle emission models. Topics covered include: Frameworks for analyzing policy and planning options; inherent conflicts in policymaking; Petroleum supply in US and internationally; Role of the transportation sector; Transportation Energy Demand and Fuel Consumption: Energy use characteristics of vehicles, modal energy use comparisons, trends, opportunities to reduce energy consumption in transportation sector; Technology Strategies to Improve Fuel Economy: Fuels, propulsion technology, vehicle size and weight, system design; Combustion theory, pollutants, standards, health effects, emission characteristics of different engines and fuels, relationship between emissions and environmental; Importance of the emission inventory, emission inventory modeling inputs (vehicle activity and emission rates), emissions model outputs, and accuracy of models and emission inventories.	F10, F12	ESP 163
Transportation Policy	ECI 165	Civil & Environmental Engineering	U	Transportation and associated environmental problems confronting urban areas, and prospective technological and institutional solutions. Draws upon concepts and methods from economics, engineering, political science and environmental studies. 1. History and nature of transportation problems; 2. Role of economics and finance in system design; 3. Planning and designing transportation systems; 4. Role of public transportation; 5. Energy, environmental, and equity impacts; 6. Design and evaluation of planning approaches	F11	
Life Cycle Assessment for Sustainable Engineering	ECI 244	Civil & Environmental Engineering	G	Life cycle assessment methodology is taught emphasizing applications to infrastructure and energy systems. Life cycle design, life cycle cost methods, other tools from industrial ecology, and links to policy are covered as well. 1. Introduction to Industrial Ecology and Sustainability Frameworks; 2. Life Cycle Assessment Methodology; 3. Applications to Energy and Transportation System; 4. Applications to Materials Production, Manufacturing, and Recycling; 5. Impact Assessment; 6. Economic Input/Output Life Cycle Assessmen; 7. Life Cycle Costing and Real Cost Accounting; 8. Life Cycle Design and Design for Environment; 9. Implications for Policy Strategies; 10. Case studies in Mobility, Food Systems, Buildings, and Material Flow Analysis	F11, F12	
Sustainable Transportation Technology and Policy	ECI 252	Civil & Environmental Engineering	G	Role of technical fixes and demand management in creating a sustainable transportation system. Emphasis on technology options, including alternative fuels, electric propulsion, and IVHS. Analysis of market demand and travel behavior, environmental impacts, economics and politics.	S11, S13	
Water Resources Management	ECI 267	Civil & Environmental Engineering	G	Engineering, institutional, economic, and social basis for managing local and regional water resources. Examples in the context of California's water development and management. Uses of computer modeling to improve water management.	F10, F12	
Advanced Water Resources Management	ECI 270	Civil & Environmental Engineering	G	Discussion of technical papers related to planning theory, system maintenance, regionalization, multi-objective methods, risk analysis, institutional issues, pricing model application, economic development, forecasting, operations, and other topics.	S12	
Ecosystems and Landscape Ecology	ECL 201	Ecology	G	Integration of concepts to understand and manage ecosystems in a complex and changing world. Emphasis on interactions among biotic, abiotic and human factors and changes over space/time. Local to global controls over water, carbon and nutrients across ecosystems/landscapes. Course covers systems thinking across space and time; feedbacks, thresholds, interactions, scale, connectivity, boundaries, heterogeneity; state factor approach; key background topics: a. Climate regulation; b. Soil formation; c. Biotic interactions; d. Heterogeneity/spatial scales; key fluxes; interactions of organisms, multiple fluxes, and the abiotic enviornment, and the integration and application of the ecosystem and landscape ecology, including managing and understanding human impacts, environmental change issues, and ecosystem services.	W12, W13	
Cultural Ecology	ECL 211	Ecology	G	Topics of current analytical and methodological importance in cultural ecology. Examination of general issues in cultural ecology through study of human response to and influence on climate. Course covers sustainability and natural resources in different production systems and different historical periods.	S11	ANT 211

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Green Engineering: Theory and Practice	ECM 281	Chemical and Materials Science Engineering	G	Methods of evaluating alternative technologies, processes, materials, chemicals, and/or products relative to pollution, waste, toxic substance use, and sustainability. Topics include environmental regulations, manufacturing operations, pollution, prevention economics, recycling, life-cycle assessment, economic analysis, design for the environment, green chemistry and toxicology.	W13	
Energy Economics	ECN 125	Economics	U	Application of theoretical and empirical tools to the energy sector. Topics include energy and environmental policy, program evaluation, the California energy crisis, market structure and power, global climate change, and command-and-control regulation. We will use theoretical and empirical methods to examine energy issues from an economics perspective. Topics will include the fundamental challenges facing energy policy-makers, focusing on regulation of the oil & gas and electricity sectors and greenhouse gas emission abatement. We will examine case studies in oil, natural gas, and electricity markets, including an in-depth analysis of the California electricity crisis. Pigouvian taxes, cap-and-trade schemes, voluntary carbon offset markets, energy efficiency, Corporate Average Fuel Economy, renewable fuel standards will be examined. A section will also be devoted to behavioral economics - how people's choices systematically deviate from the predictions of economic models - and what this implies about optimal policy design.	W12, W13	
Introduction to Environmental Education	EDU 142	Education	U	Study of history, philosophy, principles and approaches to environmental education (EE) and outreach; learning theories, teaching strategies and techniques in EE and outreach; evaluation of EE curricula in non-formal and in-school contexts; observing, aiding and facilitating local environmental education programs. Course covers range of topics including principles of environmental education, designing activities, place-based education, citizen science and community-based research, changing bheaviors toward environmental problems and solutions, and environmental outreach, marketing, and communications.	S11, S12, S13	
Issues in Engineering Design	EEC 196	Electrical and Computer Engineering	U	The course covers various electrical and computer engineering standards and realistic design constraints including economic, manufacturability, sustainability, ethical, health and safety, environmental, social, and political. This course will discuss impacts of electrical and computer engineering design, including the following considerations: Economic Issues; Ethical Issues; Sustainability; Health and Safety; Manufacturability; Environmental Issues; Societal Impacts; Political. Examples of the impact and interaction of electrical and computer engineering design with these various issues will be presented.	F10, F11, F12	
Stuff: Diversity of Materials in Our Lives	EMS 002	Chemical Engineering and Materials Science	U	Role of materials in technological societies and their impact on our way of living. Exploration of how materials are extracted from the earth, processed, and shaped into products, including discussion of disposal and re-use of materials. Course includes: I. Introduction to the diversity of materials; II. How do we choose materials for our needs?; III. The role of structure and processing in shaping materials; IV. What are products made from and why?; V. Economics of selecting materials; VI. Aesthetics and product making with new materials; VII. Recycling and Disposal; VIII. Waste and culture; IX. The future of materials and how we use them	F10, F12	
Environmental Physics and Society	ENG 160	Engineering	U	Impact of humankind on the environment will be discussed from the point of view of the physical sciences. Calculations based on physical principles will be made, and the resulting policy implications will be considered. Course examines fossil fuels and their limited supply, climate change, and alternative (sustainable) energy, especially wind, geothermal, electric transportation, solar, biofuels and solar fuels. The course emphasizes ethics and sustainable policy.	S11, S12, S13	PHY 160
Science and Technology of Sustainable Power Generation	ENG 188	Engineering	U	Focus on scientific understanding and development of power generation that is the basis of modern society. Concentration on power generation methods that are sustainable, in particular, discussion of the most recent innovations. 1) Introduction to the basic principles of power production; 2) the study of the latest innovations in sustainable power production; 3) environmental impacts of the power production method; 4) economic consequences of the production methods; 5) Globalization of the production methods.	S13	
Restoration Ecology	ENH 160	Environmental Horticulture and Urban Forestry	U	The focus of this course is exploring the interacting factors that underly an ecosystem's sustainability, since restoration ecology focuses on repairing a degraded system to a point where it can maintain itself over the long-run. Social and economic sustainability are incorporated in the last 2 classes of the quarter, where we determine how public support (or lack of support) can affect the success of a restoration project, and the economic costs and benefits associated with restoration(e.g. for every $1 spent on rangeland restoration, there is a net benefit of $2.50 in improved livestock production).	S11, S13	

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Restoration Ecology Laboratory	ENH 160L	Environmental Horticulture and Urban Forestry	U	This is a companion laboratory class to ENH 160. In this class, we work with a local agency/landowner to monitor and design a restoration project. Part of the baseline data gathered includes human use of the project site, as well as the public's goals/expectations for the site, as well as the costs involved with doing restoration.	S11, S13	
Literature and the Environment	ENL 184	English	U	UC Davis Chancellor Linda Katehi recently unveiled a new vision plan that emphasizes "global environmental sustainability" as a major goal for the university. But what place is there for literature in such a vision? This course will explore the relation between environment, ecology, and the humanities, focusing on the ways that literature has helped shape attitudes and actions toward the nonhuman world--and been shaped itself in the process. We'll move topically, examining crucial early distinctions between the natural world as a space of leisure or labor, freedom or servitude, spiritual cleansing or material pollution, contemplative solitude or collective action. Readings will range from Virgil and Milton's classic pastorals to Sina Queyras's attempt last year to write a pastoral of the freeway system; from James Grainger's 18th-century manual on how to run a slave plantation to Michael Pollan's 20th-century "gardener's education"; from the antisocial Daniel Boone and the misanthropist Robinson Jeffers to the agrarian communities of Wendell Berry and Ruth Ozeki. On the shores of Walden Pond and in the trash heaps of Istanbul, from the perspectives of elephants and eco-terrorists, we'll discover our own answers to the chancellor's call.	W11, S13	
Water Quality at Risk	ERS 008	Environmental and Resource Sciences	U	Natural and human threats to water quality. Balance of science and policy in all aspects of attaining, maintaining, and managing water quality, water contamination. Decoding popular media coverage of water quality and water contamination. Topics include: 1. Water quality framework: Science, Policy, Stakeholders, Institutions. 2. Groundwater issues, contamination and lag times. 3. Water quality as portrayed in popular movies. 4. Water quality as portrayed in popular novels. 5. Industrial contaminants. 6. Agricultural contaminants. 7. Natural contaminants.8. Surface water issues. 9. Clean Water Act, Water Quality Standards, and Total Maximum Daily Loads. 10. Nutrients and dissolved oxygen. 11. Metals. 12. Coastal issues. 13. Emerging contaminants. 14. Water quality abroad	W11	
Water And Society	ERS 121	Environmental Resource Science	U	The role of water as an essential natural resource in contemporary society. Aspects of the scientific method, including descriptions of natural phenomena, measurement techniques, and predictive models. Supply and use of water for municipalities, agriculture, industry, wildlife and recreation.	F10	
Role of Fire in Natural Ecosystems	ERS 141	Environmental Resource Science	U	Disturbance theory: fire as a perturbation; Fire physics; Fire behaviour modeling; Fire effects on plants, populations, and communities; Fire effects on wildlife; Fire effects on soils, watersheds, and air quality; Case studies: grasslands, chaparral, oak woodlands, boreal forests, Pacific Northwest forests, montane mixed conifer forests, tropical forests, eastern deciduous forest, and desert scrub; Use of fire by indigenous human populations; History of fire management and mismanagement by state and federal agencies; Fire as a restoration tool: ecological, policy, and management issues	W11	
Environmental Issues	ERS 195	Environmental Resource Science	U	Students learn about contemporary environmental issues or problems from the combined perspectives of the physical sciences, ecological sciences and policy/management. Themes are broad and cover many aspects of environmental sciences, including physical/chemical, biological/ecological and social/management issues. Examples of such broad themes/topics are: climate change, Sustainable Agriculture, Total Maximum Daily Load (TMDL) regulations, Environmental Quality, Environmental Change, the Delta, Biodiversity, and others. Each of the 10 weeks is dedicated to a specific topic.	W11	
Water Quality at Risk	ESM 008	Environmental Science and Management	U	Natural and human threats to water quality. Balance of science and policy in all aspects of attaining, maintaining, and managing water quality, water contamination. Decoding popular media coverage of water quality and water contamination. Topics include: 1. Water quality framework: Science, Policy, Stakeholders, Institutions. 2. Groundwater issues, contamination and lag times. 3. Water quality as portrayed in popular movies. 4. Water quality as portrayed in popular novels. 5. Industrial contaminants. 6. Agricultural contaminants. 7. Natural contaminants.8. Surface water issues. 9. Clean Water Act, Water Quality Standards, and Total Maximum Daily Loads. 10. Nutrients and dissolved oxygen. 11. Metals. 12. Coastal issues. 13. Emerging contaminants. 14. Water quality abroad	W12, W13	
Global Environmental Interactions	ESM 120	Environmental Science and Management	U	Relationships among climate, hydrology, biogeochemical cycles, soils and vegetation distribution in diverse landscapes and biomes. Emphasis on physical, chemical, and biological processes affecting ecosystems from the poles to the equator, and human impacts on the environment.	W11, W12, W13	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Water Science and Management	ESM 121	Environmental Science and Management	U	Role of water as an essential natural resource in contemporary society. Aspects of the scientific method, including descriptions of natural phenomena and underlying physical causes. Water for cities, agriculture, industry, wildlife and recreation; case studies of water management. Main topics include: I. Survey of water use in the home, for agriculture, for transportation, for industry, for education, for recreation, and for wildlife. II. Concepts and methodology in water science, including unifying concepts (models), components of the hydrologic cycle, and water quality. III. Contemporary problems and strategies for management, including water delivery, water quality and protection from floods and droughts.	F11, F12	
Air as a Resource	ESM 131	Environmental Science and Management	U	Degradation of the atmospheric resource, historical aspects and effects of air pollution examined. Evaluation of primary gaseous and particulate pollutants and discussion of their impact. Topics include: 1.Introduction to air pollution. 2. The Atmosphere: temperature and pressure structures; definitions of different portions of the atmosphere. 3. Pollution and its sources: point, area, and line sources. Anthropogenic and natural sources. 4. Ozone in the troposphere: precursors and mechanisms for formation. 5. Particulate Matter (PM): sources, concentrations, and effects on health and visibility. 6. Source apportionment of tropospheric pollution using Chemical Mass Balance (CMB) calculations. 7. Source Modeling using simple box models. 8. Atmospheric Dispersion: Gaussian Plume Equation and its application. 9. Effects of air pollution on health. 10. Visibility and haze from particles. 11. Effect of air pollutants on climate. 12. State and federal air pollution regulations.	S12, W13	
Role of Fire in Natural Ecosystems	ESM 141	Environmental Science and Management		Fire regimes and roles in major North American vegetation types, especially in the west. Physics of fire, fire effects on organisms and ecosystem functioning, fire effects on plants, populations, and communities, fire effects on soils, watersheds, and air quality, reconstructing fire histories, fire as a restoration tool: ecological, policy, and management issues, and fire use by indigenous people.	W12, W13	
Integrating Environmental Science and Management	ESM 195	Environmental Resource Science	U	Students learn about contemporary environmental issues or problems from the combined perspectives of the physical sciences, ecological sciences and policy/management. Themes are broad and cover many aspects of environmental sciences, including physical/chemical, biological/ecological and social/management issues. Examples of such broad themes/topics are: climate change, Sustainable Agriculture, Total Maximum Daily Load (TMDL) regulations, Environmental Quality, Environmental Change, the Delta, Biodiversity, and others. Each of the 10 weeks is dedicated to a specific topic.	W11	
Environmental Analysis	ESP 001	Environmental Science & Policy	U	Analysis of the physical, biological, and social interactions which constitute environmental problems. Emphasis on analysis of environmental problems, the consequences of proposed solutions, and the interaction of environmental science and public policy in creating solutions. Knowledge of the scientific basis of the current understanding of environmental issues. An appreciation of the technical, political and legal issues associated with getting better scientific information for the purpose of environmental policy. An understanding of the public policy process, including major statutes, agencies and organizations responsible for environmental policy. Awareness of the principle debates in current public policy regarding the environment. Exposure to the interaction of physical, biological and social sciences in solving environmental problems. Example topics include the Endangered Species Act and Biodiversity, Water Policy in California, and a Sustainable Approach to Community Development and Land Use Planning, Conservation of Agricultural Land, Managing Global Climate Change.	F10, F11, F12	
Current Issues in the Environment	ESP 010	Environmental Science & Policy	U	Analysis of the physical, biological, and social interactions which constitute environmental problems. Emphasis on analysis of environmental problems, the consequences of proposed solutions, and the interaction of environmental science and public policy in creating solutions.	W11, W12, W13	
Ecology, Nature, Society	ESP 101	Environmental Science & Policy	U	Interdisciplinary study of diversity and change in human societies, using frameworks from anthropology, evolutionary ecology, history, archaeology, psychology, and other fields. Topics include population dynamics, subsistence transitions, family organization, disease, economics, warfare, politics, and resource conservation.	W11, S12	ANT 101
Principles of Environmental Science	ESP 110	Environmental Science & Policy	U	Application of physical and chemical principles, ecological concepts, and systems approach to policy analysis of atmospheric environments, freshwater and marine environments, land use, energy supplies and technology, and other resources.	W11, W12, W13	
Environmental Law	ESP 161	Environmental Science & Policy	U	Introduction for non-Law School students to some of the principal issues in environmental law and the judicial interpretation of some important environmental statutes, e.g., NEPA.	S11, S12, S13	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Environmental Policy	ESP 162	Environmental Science & Policy	U	Course compares economic with socio-cultural approaches to understanding the causes of environmental problems and strategies for addressing them. Includes different approaches to the policy process, policy instruments, and environmental behavior. Applies these principles to several problems. Topics include: Economic Approaches to Environmental Problems, Socio-Cultural Approaches to Environmental Problems, Political Actors in Environmental Policy, Theories of the Policy Process and Environmental Behavior IRC, ACF, diffusion models, Policy Tools and Environmental Outcomes, Case Studies in Air Policy, Case Studies in Water Policy, Case Studies in Biodiversity,Case Studies in Climate Change	W11, W12, W13	
Energy and Environmental Aspects of Transportation	ESP 163	Environmental Science & Policy	U	Engineering, economic, and systems planning concepts. Analysis and evaluation of energy, environmental and selected environmental attributes of transportation technologies. Strategies for reducing pollution and petroleum consumption in light of institutional and political constraints. Evaluation of vehicle emission models. Topics covered include: Frameworks for analyzing policy and planning options; inherent conflicts in policymaking; Petroleum supply in US and internationally; Role of the transportation sector; Transportation Energy Demand and Fuel Consumption: Energy use characteristics of vehicles, modal energy use comparisons, trends, opportunities to reduce energy consumption in transportation sector; Technology Strategies to Improve Fuel Economy: Fuels, propulsion technology, vehicle size and weight, system design; Combustion theory, pollutants, standards, health effects, emission characteristics of different engines and fuels, relationship between emissions and environmental; Importance of the emission inventory, emission inventory modeling inputs (vehicle activity and emission rates), emissions model outputs, and accuracy of models and emission inventories.	F10, F12	ECI 163
Ocean and Coastal Policy	ESP 166N	Environmental Science and Policy	U	Overview of U.S. and International ocean and coastal policy, including energy, coastal land-use and water quality, protected areas and species. Since the oceans cover 71% of the earth's surface and projections are that by 2025, over 75 percent of the U.S. population will live along the coast, an interdisciplinary understanding of ocean and coastal policies and management is essential for ensuring healthy and resilient coastal communities and seas. The class will provide students with the necessary historical perspective on the evolution of policies in the U.S. to evaluate the current suite of ecosystem-based approaches proposed to address climate change, invasive species, overharvesting, pollution, and habitat loss. Special attention will also be paid to issues off of California, such as the role of the California Coastal Commission and the Marine Life Protection Act. Specific topics include offshore energy development, marine pollution, coastal and marine spatial planning, marine protected areas, marine mammal protections, coastal land-use and water quality, shoreline protection, and recreation and commercial fisheries management.	S13	
Energy Policy	ESP 167	Environmental Science and Policy	U	Survey of primary energy resources (fossil, renewable, nuclear), energy conversion methods, future energy demand scenarios, and environmental impacts of energy. Overview of energy policy in the U.S. Analysis of policy alternatives for addressing energy-related environmental and national security issues. Students complete hands-on term projects on energy issues within UC Davis and the City of Davis.	S12	
Water Policy and Politics	ESP 169	Environmental Science and Policy	U	The governance of water, including issues of water pollution/quality and water supply. The politics of water decision-making and effectiveness of water policy. Broad focus on federal water policy, with case examples from nationally significant U.S. watersheds. Course covers: Water Resources in the United States, Political Economy of Water, Common Pool Resource Management, Politics of Water Institutions, Water Quality Policy, Water Supply Policy, Water and Biodiversity, Watershed Management, International Water Policy, California Water Policy	S12	
Conservation Biology Policy	ESP 170	Environmental Science and Policy	U	Analysis of policies designed to conserve species and their habitats. Emphasis on how individual incentives affect the success of conservation policies. Valuation of endangered species and biodiversity. Criteria for deciding conservation priorities.	S13	
Natural Resource Economics	ESP 175	Environmental Science & Policy	U	Economic concepts and policy issues associated with natural resources, renewable resources (ground water, forests, fisheries, and wildlife populations) and non-renewable resources (minerals and energy resources, soil).	S11, S12, S13	ARE 175

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Environmental Impact Assessment	ESP 179	Environmental Science & Policy	U	Introduction to the information resources and methods typically used in environmental impact analysis. Emphasis on how environmental information is applied to planning, environmental regulation, and public policymaking, with case studies from California land use and natural resource policy. The goal of this course is to provide students with a practical introduction to the process of conducting environmental impact analyses required by American environmental laws and regulations. Examples concentrate on planning and environmental policymaking in California, and illustrate application to national, state, and local decision processes. A heavy emphasis will be placed on understanding the kinds of information resources (GIS, imagery, public databases, monitoring, modeling) that are increasing used to evaluate environmental change.	W11, W12, W13	
Workshop on Food System Sustainability	ESP 191A	Environmental Science & Policy	U	First in a two-quarter senior capstone course sequence. Identify projects addressing specific problems and opportunities of sustainable agriculture and food systems, form multidisciplinary teams, and identify and consult with key stakeholders to understand their needs and concerns. Projects will take an integrated, multi-disciplinary approach, involving agricultural, environmental, and social sciences, and, hence, require teamwork. Projects may be formulated at many scales, including the farm, ranch, or enterprise level, or at the community, watershed, regional, state, national, or global scale. Illustrative examples include (but are not limited to) design and implementation of campaigns to improve access to food and consumer information; community organizing around school gardens; assessment of the impact of community-supported agriculture or farmers' market projects; communication projects aimed at raising awareness of sustainability challenges and response options; analyses of policies, programs, and/or practices for addressing climate change; resource conservation; land, air and/or water resource management; farm labor issues; viability of small- and mid-sized farms; energy efficiency; agrochemical pollution; and integrated pest management.	W12, F12	
Workshop on Food System Sustainability	ESP 191B	Environmental Science & Policy	U	Continuation of course 191A. Student teams conduct analyses of a specific issue in sustainable agriculture or food systems, prepare a critical assessment of technological, economic, environmental, and social dimensions of options for action and present their results to stakeholders.	S12, W13	
Sustainable Transportation Technology and Policy	ESP 252	Environmental Science & Policy	G	Role of technical fixes and demand management in creating a sustainable transportation system. Emphasis on technology options, including alternative fuels, electric propulsion, and IVHS. Analysis of market demand and travel behavior, environmental impacts, economics and politics.	S11, S13	ECI 252
Economic Analysis of Resource and Environmental Policies	ESP 275	Environmental Science & Policy	G	Development of externality theory, market failure concepts, welfare economics, theory of renewable and non-renewable resource use, and political economic models. Applications to policy issues regarding the agricultural/environment interface and managing resources in the public domain.	S13	ARE 275
The Role and Applications of Toxicology in Modern Industry	ETX 130	Environmental Toxicology	U	Role of toxicology in industry research and development, human health and environmental protection, hazard and risk evaluations, risk management and communications, product stewardship, and regulatory compliance. Scientific principles and methods of toxicology in chemical, energy, pharmaceutical, pesticide, biotechnology industries.	S11	
Legal Aspects of Environmental Toxicology	ETX 138	Environmental Toxicology	U	Federal and California legislation concerning air and water pollution, pesticide use, food and feed additives, consumer protection, and occupational exposure to toxic substances; roles of federal regulatory agencies; alternatives to government control.	W11	
Global Change Ecology	EVE 120	Evolution and Ecology	U	Treatment of historical evolution of the biosphere resulting from physical, chemical, and biological influences. Special focus upon changes caused by humans. Topics pertain to biodiversity, resources, conservation, and ecosystem services. Topics include the ecological history of Earth; energy and human ecology; human population in an ecological context; the human role in changing Earth; and the future?.	S11, S12, S13	
Modern and Ancient Global Environmental Change	GEL 010	Geology	U	Fundamental scientific concepts underlying issues such as global warming, pollution, and the future of nonsustainable resources presented in the context of anthropogenic processes as well as natural forcing of paleoenvironmental change throughout Earth's history.	S11, S12, S13	
Energy and the Environment	GEL 018	Geology	U	Conventional and alternative energy resources and their environmental impacts. Basic principles, historical development, current advantages and disadvantages, future prospects. Oil, natural gas, coal, nuclear, wind, geothermal, water, tidal, solar, hydrogen, and other sources of energy for the 21st century.	W12	
Environmental Geology and Land Use Planning	GEL 134	Geology	U	Geologic aspects of land use and development planning. Geologic problems concerning volcanic and earthquake hazards, land stability, floods, erosion, coastal hazards, non-renewable resource extraction, waste disposal, water resources.	W12, W13	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Ecogeomorphology	GEL 136	Geology	U	The field of watershed science, and specifically the study of streams, is inherently multidisciplinary, involving a broad array of physical, biological and social sciences. Traditional hierarchical undergraduate and graduate education programs that train students in the fields that support watershed science typically emphasize in-depth study within a specific discipline. This focused education is vital to producing professionals with useful technical and analytical skills. However, most students who pursue careers in watershed and stream analysis rarely work solely within their discipline. Rather, their work is inevitably integrated with other professionals addressing related issues with different skill sets. The ability to work closely and collaboratively with professionals from different backgrounds is fundamental to success in the field of watershed science. The Ecogeomorphology course fills a unique niche in the UC Davis curriculum. The course brings together advanced undergraduate and beginning graduate students from an array of backgrounds to work as collaborative, multidisciplinary teams on critical river and stream management questions. Each year, the Ecogeomorphology course examines an issue that impacts the management of river and stream ecosystems. During class, the students discuss this issue in detail, review published literature, and prepare individual reports for publication on the web. Following the period of classroom study, the students conduct a two-week field study of a selected watershed. These field studies involve collection of original information on aquatic and riparian ecology, hydrology and fluvial geomorphology. Students work in teams, sharing their unique expertise with other team member. Through collaboration the student becomes teacher, much as they will in their professional lives. With field studies in Alaska, northern California, British Columbia and the Grand Canyon, students also participate in a capstone course that they will never forget.	S11, S12	
Oceans and Climate	GEL 232	Geology	G	Modern climate change and linkages between the ocean-atmospherecryosphere-terrestrial climate system. Importance of the ocean in forcing climate change, and the impacts of anthropogenic processes on the ocean. This course will be composed of both lectures and discussion with a focus on the role of the oceans in the climate system and the response of ocean circulation and environments to natural and anthropogenic forcing of the climate system. The course will examine recent research and state-of-the-art techniques for investigating the ocean-climate system. Topics may include Arctic sea ice decline, ocean acidification, major paleoceanographic events in the geologic record, modern ocean circulation changes, and marine environments impacted by climate change. The course will include reading material from both books and peer-reviewed literature. The course will discuss techniques of communicating climate change science to the general public and the students will complete an outreach project of their design as a final project for the course (e.g., website, science curriculum) that explains some component of the course material to a broader audience.	W13	
Advanced Physical Geography - Climate Change	GEO 211	Geography	G	Discussion of the physical science tradition in geography, including key concepts and current research in climatology, geomorphology, soils geography, biogeography, climate change, watershed science, and coastal studies. Research paradigms, programs, and methods as used by physical geographers will be discussed. As an advanced physical geography course, we will use a natural sciences approach and focus on the processes and mechanisms that trigger climate change, and on methods that allow us to reconstruct past climate change and model/predict future climate change.	F10	
Global Environmental Interactions	HIS 109A	History	U	Global, comparative study of how environmental change, human perceptions of nature, and manipulations of nature have changed over time. Primary focus post-1500, emphasis on critically analyzing many common ideas of environmental change.	W11, W12	
American Environmental History	HIS 172	History	U	Examination of changing relations between people and nature in the area of the current United States from pre-Columbian times to the present. Topics include ecological change; perceptions of nature; social conflicts over “proper” uses of nature; environmental movement. How have connections between people and nature changed over time? Indian environments of pre-Columbian period; biotic invaders and immigrants; ecological changes of the 18th and 19th centuries; images of nature and landscape; engendering gardens; nuclear weapons, pesticides, and the idea of fragile nature; conservation movement; creating the wilderness; back to earth and the environmental movement; toxics and waste disposal; the Reagan backlash; nature and the new millennium.	S12, W13	
Water, Power, Society	HYD 010	Hydrology	U	Water resources issues. How water has been used to gain and wield socio-political power. Water resources development in California as related to current and future sustainability of water quantity and quality. Roles of science and policy in solving water problems.	S11, S12, S13	SAS 10

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Hydrological Processes in Ecosystems	HYD 143	Hydrology	U	Movement and storage of water are integral parts of landscape and ecosystem functioning. Hydrological processes in individual ecosystems and the role of water linking the myriad components of the landscape. Course looks at how biota influence the hydrologic cycle and vice versa, how humans have impacted ecohydrology in various landscape settings, and the role of natural distrubance regimes in ecohydrology. Students will also learn how to communicate the essential elements of the scientific method based on scientific experiments that they create.	W12	
Water Law	HYD 150	Hydrology	U	Principles and issues of California Water Law. Types of water rights, groundwater rights and management, and protection of instream uses. Water projects, role of federal government and federal/state relations. Basic water quality acts, endangered species act, water transfers and current water issues.	W11, W12, W13	
Introduction to International Agricultural Development	IAD 010	International Agricultural Development	U	Theories, practices and institutions relating to agricultural development; the interaction of changing social, cultural and economic organization through successive stages of economic development; impact of new agricultural technology on underdeveloped regions.	SS-1 2010, SS-1 2011, SS-1 2012	
Agroforestry: Global and Local Perspectives	IAD 160	International Agricultural Development	U	Traditional and evolving use of trees in agricultural ecosystems; their multiple roles in environmental stabilization and production of food, fuel, and fiber; and socioeconomic barriers to the adoption and implementation of agroforestry practices. Topics covered include: 1. Overview of agroforestry systems, 2. Population growth, the fuelwood crisis and the roles of trees in tropical agroecosystems, 3. Shifting cultivation systems, 4. Alley cropping: conceptual overview, perceptions and realities, 5. Alley cropping: competition and yield issues, 6. Importance of symbiotic nitrogen fixation in AF systems, nutrient cycling and nutrient capture, 7. Socio-economic barriers to the adoption of agroforestry practices, 8. The role of indigenous knowledge in the adoption of agroforestry practices	F10, F12	
Program Development for International Agriculture	IAD 170	International Agricultural Development	U	Principles of leadership and management for international agricultural development. Organizations and organizational behavior, and the implications for planning and administering organizations involved in the global development effort. Students learn about PACE (Practicing Agricultural Community Entrepreneurship) and the centrality of projects in building sustainable programs. Students study PACE projects, past or ongoing, to learn about sustainable "real world" development.	F12	
The Economics of Small Farms and Farming Systems	IAD 201	International Agricultural Development	G	Economic perspective on small farm development. Establishes a basis for predicting farmers' responses to changes in the economic environment, and for proposing government policies to increase small farm production and improve farmer and national welfare.	W11, W12, W13	
Analysis and Determinants of Farming Systems	IAD 202N	International Agricultural Development	G	Unifying concepts of cropping systems in temperate and tropical climatic zones; agroecosystems stability, diversity and sustainability; management strategies, resource use efficiency and their interactions; role of animals, their impact on energy use efficiency, nutrient cycling, and providing food and power.	S11, S12, S13	
Project Planning and Evaluation	IAD 203N	International Agricultural Development	G	Interdisciplinary setting for application of student skills and specialization to a "real world" development project. Focus on team-building and effective interdisciplinary problem-solving methods, with the objective of producing a project document and presentation within a specified deadline. Course is focused on the design, implementation and evaluation of projects that lead to sustainable programs. Students in the course must engage with local stakeholders who are considered the owners and controllers of the program once it is established; so there is a commitment by all parties to assure that the project is designed and carried out in a manner that assures sustainability: e.g. a clean water system, a new school, a maternal child health center, a small holder farmer savings scheme. The project must be designed to be financially sustainable, as well as with sufficient human skills (people trained) and with natural resources treated in a renewable manner.	S12, W13	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Seminar on Alternatives in Agriculture	IAD 290	International Agricultural Development	G	Seminar on topics related to alternative theories, practices and systems of agriculture and the relationship of agriculture to the environment and society. Scientific, technological, social, political and economic perspectives. The Winter 2011 Alternatives in Agriculture Seminar will explore diverse aspects of, and perspectives on, agricultural and food systems, with a focus on alternative approaches. We will hear a wide range of participants in agriculture and food systems describe their work and tell their stories and we will look for common themes in their situations, efforts, successes and challenges. We will examine a number of topics related to themes such as: • Opportunities and challenges for beginning and small scale farmers • Issues relevant to both rural and urban populations such as food shed assessments, farm-to-school programs, farm worker conditions and issues, urban agriculture projects • Ecosystem services in agriculture and on-farm habitat: benefits, incentives, and conflicts and other interaction related to food safety and sustainability.	W11	PLS 190
Food Systems Analysis	IAD 298	International Agricultural Development	G	This food system analysis course links the conceptual and practical considerations of system analysis and develop a base of resources and tools for emerging practitioners. We will explore the process of food system assessment with an emphasis on: - Analyzing the relationships among the environment, food supply, markets, American diets and the health of consumers and critically explore the influences on those relationships in the food system. - Reviewing various conceptual frameworks for analyzing the food system from different perspectives. - Comparing and contrasting different methods for analyzing the sustainability of different food system sectors. - Identifying key leverage points in the food system and how they might be influenced to affect positive change. - The course format will include student-led discussion, guest presentations and panels, and will highlight developing the practical skills to conduct a food systems assessment. To develop their own tools for analysis, students will select and critically analyze one regional food system assessment in the US and then build on the strengths, weaknesses, and gaps in the existing approach to outline a design for a food system assessment in Yolo County.	W11	CRD 298
International Environmental Law	LAW 230	Law	G	Provides an overview of the structure and basic principles of international environmental law and policy. The course considers the challenge of addressing global environmental problems in a system characterized by multiple sovereign governments, the regulatory limitations of U.S. law, and the basic structure and principles of international environmental law, as well as substantive areas such as climate change, biodiversity and wildlife protection, and the intersection of international trade and the environment.	Spring 11, Spring 13	
Free Trade and the Environment	LAW 230T	Law	G	The course will examine the relationship between legal rules relating to trade and rules for the protection of the environment. The course will review many environmental issues that are emerging as a result of open trade, and will explore provisions of various international trade agreements relevant to environmental protection, including the North American Free Trade Agreement, the World Trade Organization Agreements (GATT, etc.), and other existing and proposed bi- and multi-lateral free trade agreements. The course will focus primarily, but not exclusively, on issues involving the United States, Mexico, Canada, and South America.	Fall 11	
Land Use	LAW 256	Law	G	Local agencies, developers, environmental interest groups, and others who regularly deal with the administrative and legislative applications of land use planning and development laws. Topics include zoning, general plans, local government land use regulation, and related areas of litigation. The expanding role of the California Environmental Quality Act.	S11, S12, S13	
Water Law	LAW 264	Law	G	Property rights in surface waters, including riparian rights, prior appropriation, and public rights; federal, state and local allocation and regulation; environmental constraints; groundwater rights and management; state and federal projects; interstate allocation; federal reserved rights; water supplies and land use planning; water transfers; contemporary challenges.	Spring 11, Fall 12	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Ocean and Coastal Law	LAW264A	Law	G	This course provides an introduction to the goals and challenges of coastal and ocean policy; the complicated web of public (international, federal, state, and local) and private interests in coastal lands and ocean waters; regulation of coastal development; domestic and international fisheries management; and preservation of ocean resources. The challenges presented by climate change to ocean and coastal environments will be featured in this course, as will recent ocean- and coastal-related disasters such as Hurricane Katrina, Superstorm Sandy and the BP oil spill. We will examine in some detail the State of California's current ocean and coastal management initiatives, which in many ways exceed those of any other U.S. state, as well as those of the federal government. The course will feature an interdisciplinary teaching approach, including guest speakers from marine science disciplines along with a field trip for enrolled students to the U.C. Davis Marine Laboratory in Bodega Bay.	Spring 13	
Natural Resources Law Seminar	LAW 265	Law	G	This seminar is devoted to in-depth coverage of two foundational principles of natural resources law: the public trust doctrine and private property rights protected under the "Takings Clause" of the U.S. and many state Constitutions with a particular focus on how those principles affect the allocation of water resources in California and the American West. The course will introduce students to the general principles underpinning both the public trust doctrine and the Takings Clause, before concentrating on their application to Western water law and policy. These related, seminar topics will include integrated study and analysis of legal, policy, scientific and governance issues affecting the natural resources in question.	Fall 10, Fall 12	
Energy Law Seminar	LAW 282A	Law	G	The seminar explores the history, law, and public policy of energy regulation in the United States, emphasizing economic and environmental regulation. Competitive restructuring of the natural gas and electric utility industries is emphasized. The basic regulatory schemes for other energy sources -- hydroelectric power, coal, oil, and nuclear power -- are explored depending on class interest. This seminar is recommended to anyone interested in the energy sector, various models of economic regulation, or regulated industries.	S12, F12	
Renewable Energy Seminar	LAW 282AT	Law		This seminar will provide a broad overview of renewable energy law and policy with a particular focus on the California policy and institutional context. The course includes an overview of climate and energy policy at the state and national levels; the role of renewable energy and its relationship to energy efficiency, fuel economy, cap and trade, and other related policies; constraints on California's ability to shape its energy future due to dormant commerce clause, federal preemption, international trade law, and other issues related to California's renewable portfolio standard and renewable fuel policies; renewable electricity; implementation of California's renewable portfolio standard; the question of whether and how to plan for renewable energy given California's existing market and institutional structure; some of the fundamentals of project development from a developer's perspective. The course also addresses renewable transportation fuels, including a review of technologies, an overview of state and national policy in this area, and analysis of how state policy is shaped and constrained by considerations of federal and international law.	Spring 13	
Environmental Law	LAW 285	Law	G	An introduction to environmental law, focusing primarily on federal law. Includes coverage of the historical development of environmental law, including the transition from common law to statutory law; the role of courts, the legislature, and the executive branch in the development and implementation of environmental policy; allocation of authority among different levels of government; the role of market forces in environmental decisions; and the major regulatory strategies that have been applied to control environmental harm. Major statutes considered include the National Environmental Policy Act, Endangered Species Act, Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, and Comprehensive Environmental Response Compensation and Liability Act.	Fall 10, Fall 11, Fall 12	
California Environmental Issues Seminar	LAW 285A	Law	G	The "nation-state" of California has for many years been a national and global leader in environmental law and policy. This seminar course will provide a survey of key California environmental law and policy issues. Policy issues include the California Environmental Quality Act (CEQA); coastal planning and regulation; renewable energy law and policy; California's leadership role regarding the law of global warming/climate change; property rights and the environment; the ecosystem crisis affecting the California Delta; the public trust doctrine; and environmental federalism (i.e., the respective California and federal roles in environmental regulation). A special feature of this course will be a number of guest speakers on the above topics, including practicing environmental attorneys, judges, policymakers and non-legal experts(e.g., scientists and economists.)	Spring 11, Fall 12	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Environmental Practice	LAW 285B	Law	G	Examines underlying theory and practice in securing compliance with our major environmental laws. After exploring basic principles of enforcement, we look at current issues arising in implementing environmental law in civil prosecutions, criminal prosecutions, and citizen suits. These include environmental federalism, deterrence-based and cooperation-based theories of enforcement, penalty policies, supplemental environmental projects, mens rea requirements for criminal violations, and standing and other prerequisites for citizen enforcement. In addition to statutory, regulatory, and case materials, the class includes case studies, role plays, and extensive policy discussion.	Spring 12	
Food Justice	LAW 285BT	Law	G	This seminar will focus on the law and policy of the emerging "food justice movement," which combines the goals and principles of the environmental justice movement with some of the policy initiatives involved in the "ethical consumption" and "sustainable agriculture" movements. Some of the readings involved will be substantive, touching on issues such as structural racism, the regulation of food production (including the farm bill), differing methods of food distribution (from the industrial food model to farmers' markets and CSAs). Issues of immigration regulation, city and regional planning, and state and local government will also be touched upon.	Fall 12	
Climate Change Law & Policy	LAW 285E	Law	G	This course addresses the legal and public policy dimensions of climate change, perhaps the most important environmental issue of our time. Climate change law and policy represent a rapidly developing field, with important changes taking place internationally, at the federal level and within the State of California. While the primary emphasis of the class will be on climate initiatives in the United States and its political subdivisions, international climate change treaties and negotiations will also be discussed. This course utilizes an integrated, interdisciplinary approach, bringing together air pollution, water supply, coastal planning, land use, ocean and fisheries and energy issues. A complete examination of climate change law and policy requires some foundational understanding of climate science and resource economics; accordingly, the course will briefly address these latter topics. Both greenhouse gas mitigation policies and climate change adaptation strategies will be featured in the course.	Fall 11	
Public Land Law	LAW 287	Law	G	"Public land" is a term of art referring to lands owned and managed by the federal government. This course covers the legal aspects of federal land management, including the history of public land law, the scope of federal and state authority over the federal lands, and the allocation of public land resources among competing uses, including extractive consumption, recreation, and preservation.	Spring 12	
Sustainable Development	LDA 003	Landscape Architecture	U	Origins, theoretical perspectives, and practical applications of the concept of sustainable development at a number of scales (site, building, neighborhood, city, region, and nation) through lectures, sketch exercises, student projects, walking tours. The course also provides students with a context within which to develop their own philosophies and visions of sustainable urban planning, design, and development. Following a philosophy of learning by doing, the class combines lectures with sketch exercises, student projects, and guest appearances by leading practitioners. A Saturday morning field trip will be scheduled to observe firsthand the built environment of a local community. Topics covered: Current sustainability challenges and opportunities; History and definitions of the concept; Theoretical perspectives on sustainability; Sustainability indicators; planning process; Site and building applications; Neighborhood applications; Town and city applications; Regional applications; National and international applications.	S11, S12, S13	
Site Ecology	LDA 050	Landscape Architecture	U	Introduction to ecological concepts, including nutrient dynamics, population regulation, community structure, ecosystem function. Principles will be applied to human activities such as biological conservation, ecological restoration, landscape planning, and management. Topics include: Climate: Moisture, temperature, light; Nutrient dynamics; Soil properties and processes; Energy flow and biogeochemical cycling; Demography, population growth and regulation; Interspecific interactions: competition, predation, mutualism; Community structure, organization and classification; Community dynamics: succession, disturbance; Ecological genetics; Evolutionary patterns and processes: adaptation, speciation; Applied ecology: biological control, conservation, restoration, landscape architecture, planning and management	S11, S12, S13	
Field Guide to Sustainable Living in Davis	LDA 098	Landscape Architecture	U	Students learn the mechanics of sustainable living in Davis and how to engage the community and spread sustainable living practices. The course is a hands on field-trip based course intended to introduce student to issues in sustainability and connect them to sustainability-related resources on campus. The course is planned and facilitated by students with experience in sustainable living on and around campus to provide a unique, non-stressful atmosphere which can be conducive to self-initiated learning.	W11, F11, F12	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Hybrid Electric Vehicle System Theory and Design	MAE 258	Mechanical and Aeronautical Engineering	G	Advanced vehicle design for fuel economy, performance, and low emissions, considering regulations, societal demands and manufacturability. Analysis and verification of computer design and control of vehicle systems in real vehicle tests. Advanced engine concepts.	W12	
Sustainable Business Ventures: Business and Energy	MGT 413	Management	G	Sustainability as a business goal extends beyond "green" products but encompasses a set of complex values that can be expressed in a multitude of ways. Sustainable development broadly defined ensures that economic and social activity can meet the needs of the present without compromising the ability of future generations to meet their own needs. Governments, businesses, civil society and individuals all have a role in promoting sustainability. This course will introduce students to sustainability goals, indicators, values, measurement techniques, and practice and how it applies to large and small enterprise. Students explore the connection between energy, health, social and environmental justice, and poverty and the implications for sustainability, the role of technology, policy, and business. Through this prism, we will investigate opportunities in energy and sustainability venturing. Students will learn about the barriers to sustainable development and discuss cost-effective, culturally appropriate solutions to energy related issues. In this class, students will: • Broaden their understanding of sustainability and how it applies to energy-related businesses and products; • Learn about why sustainability offers business opportunity • Learn to analyze the economic, social, cultural, and political limitations that might affect the implementation and sustainability of technologies/products/businesses • Expand their potential as a leader in sustainable business	W13	
Native American Public Health: Topics and Issues	NAS 240	Native American Studies	G	Introduction to Native American public health issues and contributing causal factors (including environmental justice and historical trauma); the dimensions of cultural competency in diagnosis and service provision; the structure of Native health care institutions; and debates in Native treatment modalities. Also covers health disparities and trends (urban and rural Indian health, mental health, pollution, labor conditions); Focus on specific populations (women, youth, LGBT); Overview of causes (intergenerational trauma, post-traumatic stress disorder); Overview of treatment modalities (Indian health policy, research, cultural competency, traditional)	W13	
Environmental Ethics	PHI 220	Philosophy	G	Intensive treatment of one or more topic(s) in environmental ethics, such as biodiversity, sustainability, composition of the moral community, invasive species, endangered species, applications of ethical theories to contemporary environmental issues. For example, many people believe that biodiversity is something that we ought to preserve. But what is biodiversity? Is it sheer number of species? Does it matter how different they are from one another genetically and morphologically? What about sub-species? Or are we seeking to preserve primarily endangered species? Or species that are useful to humans, either medically or scientifically or in some other way? Moreover, why is biodiversity of value, and how does our answer to that question affect our answers to the previous questions? Students in the seminar would explore answers to these questions and examine arguments that supported different answers.	W12	
Gateways to Emergence in Science and Society: Toward a Science of Sustainability	PHY 150	Physics	U	The aim of this course is to provide students with the tools they need to develop an emergent perspective on problems in science and society by focusing on gateways to emergent behavior we have identified in the physical and biological sciences and on gateways that have been proposed for solving some of our major societal problems. This course is an experiment, stressing interdisciplinary and integrative learning at the upper undergraduate and graduate level. There are several aspects to the experiment: the topic of emergence as a unifying principle bringing together students in different sciences; the emphasis on emergent global problems and the science needed to assure clean, secure, and sustainable energy and food supplies to power and stabilize our world; the integration of high-profile guest lecturers who will also participate in other campus activities; and grading based on a website created by each student. This experiment will set the stage for other innovative, rigorous, and adventurous intellectual experiences for UC Davis students.	W12	CHE 298

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Environmental Physics and Society	PHY 160	Physics	U	Impact of humankind on the environment will be discussed from the point of view of the physical sciences. Calculations based on physical principles will be made, and the resulting policy implications will be considered. Course examines fossil fuels and their limited supply, climate change, and alternative (sustainable) energy, especially wind, geothermal, electric transportation, solar, biofuels and solar fuels. The course emphasizes ethics and sustainable policy.	S11, S12, S13	ENG 160
Plant Ecology	PLB 117	Plant Biology	U	The study of the interactions between plants, plant populations or vegetation types and their physical and biological environment. Special emphasis on California. Topics covered include: 1) Introduction: the plant in the environment; 2) resource acquisition; 3) resource allocation; 4) light and temperature as limiting factors; 5) water as a limiting factor; 6) soils and nutrients as factors; 7) damage to plants; fire, wind, etc.; 8) the demography of plants; 9) life histories of plants; 10) competitive interactions; 11) positive and negative effects of neighbors; 12) interactions with animals--herbivory, pollination; 13) the ecology of seeds and seedlings; 14) communities and ecosystems; 15) the structure and productivity of plant communities; 16) geographic variation in the functional attributes of communities; 17) succession; 18) plants and global environmental change.	F10, F11, F12	
Introduction to Plant Pathology	PLP 120	Plant Pathology	U	The nature, cause, and control of plant diseases. Plant disease is presented as the result of four interacting factors: host plants, pathogens, the environment, and human activity. We introduce plant disease in an historical perspective showing that it can have huge socio-economic and cultural significance by using important case studies such as the Irish potato famine of the mid 19th century and the US Chestnut blight epidemic of the early 20th century. Both of these plant disease epidemics impacted directly on the sustainability of the cultures they affected, driving massive social changes. The course then moves on to consider disease from a more mechanistic basis, with reference to themes such as global food security and the use of GM organisms that have a direct bearing on sustainability.	S11, F11, F12	
Agricultural Biotechnology and Public Policy	PLP 140	Plant Pathology	U	Examination of the development and deployment of agricultural biotechnologies, particularly transgenic crop plants, microorganisms and animals, with consideration of conventional agriculture, public perceptions of technologies, food safety, environmental impact, public policies and regulations. Topics covered include: Comparison of old and new biotechnologies, including benefit/risk tradeoffs; Crop improvement and benefit/risk analysis for conventionally developed cultivars; Inputs, outputs, energy balances and environmental impacts in crop agriculture, including integrated pest management and organic farming systems; efficiency and sustainability; What makes a plant a weed; costs of weed control; Transgenes for agronomic traits; Public perception of risk from transgenic crops and crop products; ballot initiatives and court cases; Transgenes for quality and novel traits; Research requirements for approval of transgenic organisms; Possible consequences of the spread of transgenes from cultivars to wild species; Biotechnology and plant patents and intellectual property rights; Federal regulations; Labeling of foods for content derived from transgenic sources; Public attitudes towards transgenic crops in North America and elsewhere; Impacts of injected recombinant bovine somatotropin (rBST) on milk production, cow health, and dairy industry economics; Agricultural biotechnology in developing countries.	S11, S12, S13	
Agriculture, Nature and Society	PLS 001	Plant Sciences	U	Multiple perspectives and connections between natural sciences, social sciences, and agriculture. Emphasizes agriculture's central position between nature and society and its key role in our search for a productive, lasting and hospitable environment. Several full-period field trips provide hands-on learning. Topics covered include: Time, earth and homo sapiens; Origins and spread of agriculture; Soil, water and plants; Early civilization and their agricultural base; Greek and Roman (Mediterranean) agriculture; Medieval (Northern European) agriculture; Major transitions in US and California agriculture; Agrarian themes in literature, art and life style; Evolution of agricultural technology; Energy, agriculture and the biosphere; Science and agriculture; Agriculture, food, and demography; Questions of scale, economics and politics; Productive ecologic balance, sense of place, futurisms	F10, F11, F12	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Plants for Garden, Orchard and Landscape	PLS 005	Plant Sciences	U	Hands-on experience with plants cultivated for food, environmental enhancement and personal satisfaction. The objective of this course is to convey the basic principles of plant science through an experiential learning process. Student gardens and hands-on laboratory exercises illustrate the requirements for plant growth and their relationship to the environment. The importance of plants for food, fiber, environmental enhancement and personal satisfaction will be demonstrated. Students will be challenged to develop an integrated knowledge of plant biology and the roles plants play in human society. Topics include establishing a vegetable garden; pruning and propagation activities; growing flowers and ornamental plants; the role of plants in human health, psychology, and well-being; biodiversity and environmental preservation; conservation of plant genetic resources; biotechnology myth and reality; plants in the marketplace and human nutrition (postharvest handling and marking); the problem of hunger; soil conservation, land use practices, urbanization and sustainability of agriculture; soil types and media, composts and composting techniques; plant nutrition; botanical gardens and arboretums: their social and economic roles; role of horticulture on personal/community well being; horticulture therapy; medicinal plants and herbal medicine.	W11, F11, F12	
Plants and Society	PLS 012	Plant Sciences	U	Dependence of human societies on plant and plant products. Plants as resources for food, fiber, health, enjoyment and environmental services. Sustainable uses of plants for food production, raw materials, bioenergy, and environmental conservation. Global population growth and future food supplies. Plants have created and continue to support the conditions necessary for life on earth. Most human communities have derived the majority of their food and much of their raw materials from plants, and the development of plant cultivation and agriculture was a decisive moment in human history. Agriculture has allowed the development of civilization, but continued population growth and decreasing available land for expansion for food production create questions about agricultural sustainability in the future. This course will examine these issues from both a scientific and a social perspective. The basic requirements for plant growth and therefore for productive agriculture will be examined in relation to global climates and the distribution of human populations. The impacts of biotechnology, globalization, energy demands, biodiversity, environmental preservation and social trends on the future of plants and agriculture will be explored. Students are challenged to critically examine the roles of scientific advances, marketing systems, consumer choices, nutritional requirements and cultural preferences in determining the types of agricultural systems that are used to produce plants for human uses.	W11, F11, F12	SAS 012
Introduction to Sustainable Agriculture	PLS 015	Plant Sciences	U	Multidisciplinary introduction to agricultural sustainability with a natural sciences emphasis. Sustainability concepts and perspectives. Agricultural evolution, history, resources and functions. Diverse agricultural systems and practices and their relative sustainability. Laboratories provide direct experience with selected agricultural practices and systems. General introduction to agricultural sustainability emphasizing natural science perspectives within an integrated multidisciplinary context that also includes social, economic and political perspectives. We will ask what is agriculture, what is it for, and how has it evolved and developed? We will explore concepts, perspectives, definitions and measures of sustainability and the evolution of the concept of sustainable agriculture. We will examine agricultural resources, functions, productivity, food chains and outputs, including externalities. We will study several historic and current agricultural systems and practices and their relative sustainability, as well as alternatives designed to improve agricultural sustainability and their relative successes. Laboratories will include two types of activities: 1. field-based activities that highlight connections between agricultural practices and scientific principles (e.g., utilizing and comparing different methods of monitoring pest and beneficial organisms on crops; comparing in-field methods of estimating nutrient levels in plants; conducting a class intercrop experiment to observe various interactions of the crops with each other and the environment); 2. on- and near-campus field trips to observe diverse production practices, agricultural systems (e.g., annual and perennial crops, grazing and confined livestock operations, integrated crop/livestock systems) that help illustrate concepts discussed in lecture. The course complements Community and Regional Development 020 by providing a natural science focus on food and agriculture within the context of integrated multidisciplinarity.	S11, S12, S13	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Organic Crop Production Practices	PLS 049	Plant Sciences	U	Principles and practices of organic production of annual crops, including organic crops, soil, and pest management, cover cropping, composting, seeding, transplanting, irrigation, harvesting and marketing. Topics include soil and fertility management; irrigation; planting; weed management; insects and diseases; harvesting and post-harvest handling; marketing: strategies, wholesale, retail, and direct marketing methods; organic laws, registration and certification; and planning and management: Integrating all the factors	S11, F11, F12	
Agriculture and the Environment	PLS 101	Plant Sciences	U	Focus on the interaction between agriculture and the environment to address the principles required to analyze conflict and develop solutions to complex problems facing society. Lectures are delivered by the instructor and guest speakers who are informed on the subject matter. The course is divided into three broad areas: 1. Factors governing the emergence of agriculture and environmentalism; 2. Key ag and environmental problems; 3. Resolving ag and environmental problems. Specific problems addressed include: Water uses and regulation of pollutants; agricultural chemicals; biotech applications; energy production from ag operations; global warming; preserving agricultural land; integrating ag and natural systems; agriculture and urbanization; confined animal feeding operations; ethics of ag production and environmentalism; global food policies and ag development; valuing ag and environmental resources; the future of agriculture in California and the US.	W11, W13	
Concepts in Pest Management	PLS 105	Plant Sciences	U	Introduction to the ecological principles of integrated pest management, biology of different classes of pests and the types of losses they cause, population assessment, evaluation of advantages and disadvantages of different techniques used for pest management, IPM programs. Topics covered include: History of pest management; Ecosystem view of pests; Pest biology compared; Basis for making pest management decisions: In order to make informed choices between pest management options it is necessary to develop information about pest populations; Review different approaches to managing pests, contrast success and utility for different classes of pests; registration, labels, tolerances, worker safety, and other legal aspects of pest management; Interactions between classes of pests: Pest management viewed at the ecosystems level; Role of ecosystem diversity in pest management; Development, implementation and examples of IPM programs; Environmental impacts and societal concerns about pest management.	F10, F11, F12	
Rangelands: Ecology, Conservation and Restoration	PLS 130	Plant Sciences	U	Introduction to the ecological principles and processes important for an understanding of the dynamics of range ecosystems. Emphasis on ecological and evolutionary concepts underlying management strategies for conserving biological diversity and environmental quality in rangelands. Course covers global distribution of rangeland ecosystems, physical environmental factors: macro- and microclimatic scales, plant-herbivore interactions and coevolution in grassland ecosystems, drought and plant adaptation, the role of fire in the ecology and management of rangelands, impacts and management of exotic species in rangelands, riparian systems and managing for water quality, woody species as keystone species in rangeland communities, and conservation of threatened and endangered species in western rangelands	W12	
Sustainability and Agroecosystem Management	PLS 150	Plant Sciences	U	Interdisciplinary analysis of agricultural production and food systems with primary emphasis on biophysical processes. General concepts governing the functioning of temperate and tropical agroecosystems in relation to resource availability, ecological sustainability, and socio-economic viability. Comparative ecological analyses of agroecosystems. This course is based on a framework of interdisciplinary analyses of agricultural production and food systems with primary emphasis on biophysical factors, processes and interactions. Focus will be on general concepts governing the functioning of temperate and tropical agroecosystems in relation to resource availability, ecological sustainability, and socio-economic viability across the globe. We will examine strategies to increase resource use efficiency while minimizing negative impacts on the environment an ensuring socio-economic viability in temperate and tropical regions. We will conduct comparative analysis of approaches to agriculture and its sustainability, including historical examples and trends, alternative systems, and its relationship to other land uses. We will explore how to holistically plan and manage systems for all-encompassing ecological sustainability.	S11, S12, S13	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Agroforestry: Global and Local Perspectives	PLS 160	Plant Sciences	U	Traditional and evolving use of trees in agricultural ecosystems; their multiple roles in environmental stabilization and production of food, fuel, and fiber; and socioeconomic barriers to the adoption and implementation of agroforestry practices. Topics covered include: Population growth, the fuelwood crisis and the roles of trees in tropical agroecosystems; Shifting cultivation systems; Alley cropping; Importance of symbiotic nitogen fixation in AF systems, nutrient cycling and nutrient capture; Socio-economic barriers to the adoption of agroforestry practices; The role of indigenous knowledge in the adoption of agroforestry practices	F10, F12	
Urban Ecology	PLS 162	Plant Sciences	U	Application of fundamental concepts and approaches in landscape and ecosystem ecology to urban ecosystems. Ecological and social drivers and responses. Landscape heterogeneity, nutrient dynamics, invasive species, altered hydrology and climate, and pollution. Discussion of primary literature. Course covers: Urban growth in the US; multi-ecological approaches to understanding cities; application of conservation approaches; invasive species and biotic homogenization; evolutionary response to urbanization; urban climate and plant response; global carbon use and storage in urban ecosystems; water and air pollution in urban ecosystems; ingrating ecological and social drivers and responders of ecosystem structure and function in urban landscapes, history of the development of urban ecology in the U.S.	W11, W12, W13	
Ecosystem and Landscape Ecology	PLS 163	Plant Sciences	U	Integration of concepts to understand and manage ecosystems in a complex and changing world. Emphasis on interactions among biotic, abiotic and human factors and changes over space/time. Local to global controls over water, carbon and nutrients across ecosystems/landscapes. Course covers: Main ecosystem and landscape principles like structure - function relationships, pools and fluxes, Systems thinking across space and time, Feedbacks, thresholds, interactions, scale, connectivity, boundaries, and heterogeneity; Key Background (state factors): Climate, Geology/Soils, Spatial heterogeneity; Key Processes across scales using the state factor approach to organize; Cross cutting topics (Application of knowledge): reilience, human influence on and response to changing ecosystems and landscapes, and comparisons across ecosystems.	W11, W12, W13	
Seminar on Alternatives in Agriculture	PLS 190	Plant Sciences	U	Seminar on topics related to alternative theories, practices and systems of agriculture and the relationship of agriculture to the environment and society. Scientific, technological, social, political and economic perspectives. The Winter 2011 Alternatives in Agriculture Seminar will explore diverse aspects of, and perspectives on, agricultural and food systems, with a focus on alternative approaches. We will hear a wide range of participants in agriculture and food systems describe their work and tell their stories and we will look for common themes in their situations, efforts, successes and challenges. We will examine a number of topics related to themes such as: • Opportunities and challenges for beginning and small scale farmers • Issues relevant to both rural and urban populations such as food shed assessments, farm-to-school programs, farm worker conditions and issues, urban agriculture projects • Ecosystem services in agriculture and on-farm habitat: benefits, incentives, and conflicts and other interaction related to food safety and sustainability.	W11	IAD 290
Environmental Politics and Administration	POL 107	Political Science	U	Introduction to the environment as a political issue in the United States and to the development of administrative mechanisms for handling environmental problems. Changing role of Congress, the presidency, the bureaucracy, and the courts in environmental policy formulation and implementation. Course covers: History of Environmental Thought, 1600-1860; History of Environmentalism, 1860-Present; California Environmental Issues; Population Growth, Air Pollution; Energy and Global Wwarming and Auto Dependency; Water Development vs. Water Conservation; Forests and Forest Protection, Pesticides, Parkes and Recreation, Endangered Species; Solid and Toxic Waste; Demographic Impact on Environmenal Attitudes; Environmental Laws and Regulations	S11, S12, SS-1 2012	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Water in Popular Culture	SAS 004	Science and Society	U	Importance of water in many aspects of society as revealed through a survey of its depictions in film. This class is about a student's individual quest to find meaning in life through illumination about our own nature, how societies create meaningful events that influence people, and the role of nature, best exemplified by water, in forming the milieu within which people strive, struggle, achieve, or fail. The class explores how control of wealth, media, and civil infrastructure can be used to manipulate societies to produce wealth for the few at the expense of the many; issues related floods, flood management, race, and socio-economic class in America; the psychological roots of individualistic behavior that explains choices that result in a variety of societal problems; the history of human civilization to explain how the modern inequitable distribution of wealth can be explained by geographical factors per the book Guns, Germs, and Steel; and issues related to worldwide poverty, pro-poor water, and the ways in which societies and individuals cope with both internal and external adversities under extreme environmental conditions.	F10, F11, F12	
Civilizations, Soil, and Culture	SAS 005	Science and Society	U	The focus of this course is to explore past civilizations and examine how their management of soil and other natural resources allowed them to flourish, decline, or perhaps fail. This course will examine agricultural practices, irrigation approaches, deforestation, and land management with a focus on soil conservation. Students will be asked to critically explore current management of natural resources and discuss discusssustainability sustainability of our own society.	S11, S12, S13	
Crisis in the Environment	SAS 009	Science and Society	U	Explores contemporary environmental issues by examining the causes, effects and solutions to a wide range of environmental problems facing the global ecosystem. Integrated discussion of political, societal and economic impact linkages with environmental problems. Is there a crisis in the California and/or global environment? It also explores contemporary environmental issues: Causes; Effects and Solutions. In this course we want students to integrate discussion of political, societal and economic impacts of environmental problems.	S11, S12, S13	
Water, Power, Society	SAS 010	Science and Society	U	Water resources issues. How water has been used to gain and wield socio-political power. Water resources development in California related to current and future sustainability of water quantity and quality. Roles of science and policy in solving water problems. Lesson topics covered include water and the power crisis; groundwater concepts; water storage and management (e.g., dams or groundwater banking?); water quality (is our drinking water safe?); watershed concepts; and agricultural water use.	S11, S12, S13	
California Geography	SAS 011	Science and Society	U	Introduction to cultural/societal patterns of California and their relationship to natural resources, biomes, geomorphology, and physiography. Focus on diversity of California's environments and their impacts on and alterations by human activities. Environmental issues in the State (urban-rural interfaces, water, agriculture, air quality, erosion).	F10, F11, F12	
Plants and Society	SAS 012	Science and Society	U	Dependence of human societies on plant and plant products. Plants as resources for food, fiber, health, enjoyment and environmental services. Sustainable uses of plants for food production, raw materials, bioenergy, and environmental conservation. Global population growth and future food supplies. Plants have created and continue to support the conditions necessary for life on earth. Most human communities have derived the majority of their food and much of their raw materials from plants, and the development of plant cultivation and agriculture was a decisive moment in human history. Agriculture has allowed the development of civilization, but continued population growth and decreasing available land for expansion for food production create questions about agricultural sustainability in the future. This course will examine these issues from both a scientific and a social perspective. The basic requirements for plant growth and therefore for productive agriculture will be examined in relation to global climates and the distribution of human populations. The impacts of biotechnology, globalization, energy demands, biodiversity, environmental preservation and social trends on the future of plants and agriculture will be explored. Students are challenged to critically examine the roles of scientific advances, marketing systems, consumer choices, nutritional requirements and cultural preferences in determining the types of agricultural systems that are used to produce plants for human uses.	W11, F11, F12	PLS 012
Global Climate Change: Convergence of Biological, Geophysical, & Social Sciences	SAS 025	Science and Society	U	Causes of global climate change and the biological, geophysical, and social consequences of such change. Methods used by different scientists for predicting future events. Complexity of global affairs. Decision making under uncertainty.	W11, W12, W13	
Global Climate Change: Convergence of Biological, Geophysical, & Social Sciences	SAS 025V	Science and Society	U	(web based course) Causes of global climate change and the biological, geophysical, and social consequences of such change. Methods used by different scientists for predicting future events. Complexity of global affairs. Decision making under uncertainty.	W12, W13	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Earth, Water, Science, Song	SAS 042	Science and Society	U	Fusion of water and soil science with performing arts. Creative communication of scientific concepts and facts through exercises in song writing and poetry. Design, discuss and conduct public performances related to the functioning of the natural world. As demonstrated by the galvanizing impact of Al Gore's film An Inconvenient Truth, Americans are sensing an urgent need to understand interactions among human activities and our physical and biological environment. Paradoxically there is sometimes an emotional barrier to studying science to understand environmental resources, while music and poetry continue to be used to celebrate the beauty of the natural world. In this course students will fuse the intellectual power of environmental science with the emotional power of the performing arts. Lectures will describe the occurrence and movement of water on earth, the natural history of soil formation, the role of plants and microbes, nutrient cycles, and some case studies of resource management to sustain human and natural ecosystems. Lake Spafford and Putah Creek on the UCD campus will serve as living laboratories. Students will communicate natural history and scientific concepts through exercises in song writing and poetry.	W11, W12, W13	
Science, Society and the Environment	SAS 090G	Science and Society	U	Contemporary environmental issues, scientific approaches to addressing these issues, and accompanying societal and ethical considerations. Course covers: environmental toxicology; What is environmental research? Who are the researchers?; Population growth, pollution, and resource consumption; Ethics and social action; Career opportunities in the environmental sciences; Ethical and moral considerations of career choices.	S11, S12, S13	
Sociology of the Environment	SOC 160	Sociology	U	Production, consumption, and urban expansion. Basic social logics surrounding current problems of resource scarcity (environmental extractions) and excess wastes (environmental additions). Ways that society can change and re-organize itself to become more environmentally conscious and hence ecologically sustainable. This course is intended to introduce students to the interplay between society and the environment, more commonly known as "Environmental Sociology." It is intended to be helpful to two types of students: (1) those students from the social sciences that wish to become more familiar with the interplay of "society" and the "environment" (2) and those from other disciplines—e.g., the natural and/or physical sciences or business management—who recognize the need to understand more about society and the ways humans and human systems interact with the environment conceptually, technologically, and materially. We will begin with a brief and broad overview of: our current societally induced or at the very least exacerbated Environmental Dilemma(s), what Environment Sociology is, what Environment Sociology seeks to ascertain. Next, we will look closely at processes of production, consumption, and urban expansion (Material factors) in an attempt to ascertain the basic logics that surround many of our current problems of resource scarcity (environmental extractions) and excess wastes (environmental additions). Furthermore, we will also look at how this same system of production and consumption is mirrored in global development patterns as well as population issues. Having spent a good portion of our initial time on material factors, we will turn our attentions to the ideological underpinnings—the belief systems that characterize society and environmental relations. This will entail looking at both critiques of how society is currently organized (capitalism, industrialism, science, patriarchy) as well as belief systems that characterize the environmental movement itself. In short, we will explore ideas of "the environment" as it is juxtaposed to "society," focusing on how current conceptions manifest and how this fictive division that separates one from the other came to be. Finally, we will end by reading and thinking of ways that society can, perhaps, re-organize itself and become more ecologically conscious.	W11, W12, F 12	
Environmental Soil Chemistry	SSC 102	Soil Science	U	Soil chemistry processes related to the fate and transport of contaminants in soil. Soil minerals, natural organic matter, surface charge, soil solution chemistry, redox reactions in soil, and sorption of inorganic and organic contaminants. SSC 102 explores the range of chemical reactions occurring in the soil which are essential for environmental and agricultural sustainability. Topics such as contaminant fate and transport, soil remediation, and carbon storage in soils are explored from a molecular scale in order to enhance student understanding of how human management of soils can be carried out sustainably.	W12, W13	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Sustainable Nutrient Management	SSC 109	Soil Science	U	Availability of nutrients in organic and conventional agricultural, vineyard, orchard and plantation forest soils; management of fertilizers, cover crops, compost, sewage sludge and manures for crop production and to prevent loss to the environment is emphasized. The course examines factors affecting the availability and movement of nutrients from the soil to plant. Management to sustain soil nutrition in organic and conventional agriculture, vineyards, orchards and plantation forestry is emphasized. The limitations in nutrient management and sources for organic agriculture will be used to illustrate challenges in increasing crop quality and productivity. Soil factors including microorganisms, cation ion exchange, texture, and moisture are used to illustrate the influence of management outcomes on nutrient availability and loss to the environment. Plant nutrient deficiency systems are discussed and demonstrated in the laboratory to understand soil and management factors affecting soil nutrients. Soil nutrient assays will be conducted to demonstrate plant nutritional requirements and to demonstrate nutrient loss to surface and ground water and as climate altering greenhouse gases.	S11, S12, S13	
Soils in Land Use and the Environment	SSC 118	Soil Science	U	Soils are considered as elements in land use planning and environmental quality. The course focuses on the sustainable use of soils, such as soil suitability for agricultural and other land uses. The class also addresses how land use practices have led to soil degradation. Other topics include waste disposal on soils and soil reclamation. Students conduct a land use study to evaluate a parcel of land, they recommend sustainable land use practices on appropriate soils and prescribe best management practices that promote sustainability of soil resources.	S11, S12, S13	
Recent Advances in Textiles: Interdisciplinary Research: Sustainability	TXC 293	Textiles and Clothing	G	The objectives of the course are: To explore interdisciplinary frameworks for research in textiles, including processes of idea generation and collaboration. To analyze and integrate diverse approaches to inquiry through case studies of interdisciplinary research, explored through the theme of sustainability. To weave creatively and critically between (a) interdisciplinary inquiry and (b) the substantive theme of sustainability in the fiber/textile/apparel complex. Topics covered include: Literature review and idea generation, textile systems for human and environmental health, textile materials: life cycle analysis, green marketing and consumer behavior, biomimesis, bio-based materials and product development, and cradle to cradle.	W11	
The Internet as a Medium for Education about Science and Sustainability	TCS 198	Technocultural Studies	U	Students will collaborate to create interactive multimedia in a studio setting. The topic: the science and technology of sustainability. The audience: middle to high school students. The approach: emergent, with the form and content generated through the interaction among the students, faculty and visitors. Our challenge will be to make "digital native" works exploiting the unique potential of the medium. We must develop an integration of content and form, combining elements of text, image, sound, video and animation in a networked architecture. We must communicate effectively in the non-linear, user-directed forum of the internet. Students will develop STEM outreach materials on the science and technology of sustainability, climate change and the environment that will expand and complement the activities of the Wolf Ridge Environmental Learning Center (see, for example, their climate change manual), LabRats and other middle and high school science programs.	W12	CHE 298
Energy Efficiency: The Other Side of the Meter	TTP 289A/B	Transportation Technology and Policy	G	This course focuses on increasing the sustainability of our energy systems by increasing the efficiency of consumption, that is, the transformation of energy into services and products. The course introduces several concepts essential for sustainability analysis, such as understanding the relationship between energy use and services, life cycle energy analysis, and techniques of energy and resource measurement. The students also get opportunities to measure energy and resource flows in real homes and commercial buildings.	F10, F11, F12	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
The Economics of Energy Efficiency [and Climate Change Mitigation]	TTP 289A/B	Transportation Technology and Policy	G	This course introduces students to market failures in the energy consumption sector, principles of cost-benefit analysis, and behavioral economics (and many other topics). All of these will help students understand how to develop sustainability policies with a sound economic basis. Why does Comcast give you set-top boxes that use as much electricity as your refrigerator? Why do many trucks lack aerodynamic spoilers even though they pay back in a few months? Market failures like these cause unnecessarily high energy use and slow the adoption of more energy-efficient technologies. This course will mostly not cover the "big picture" of energy economics; instead, it will explore a few, narrow–but crucial–topics, such as: - Why won't my landlord insulate the attic? - What makes an investment in energy efficiency attractive? - How does a company profit by sharing energy savings? - Saving energy in one place just causes increased energy use someplace else, right? - What is the connection between energy-efficiency and climate change? In the end, you will better appreciate the larger economic and environmental issues by following the responsibility, the decisions, and the money.	W11, W12, W13	
D-Lab I: An Overview of Energy and Development	TTP 289A	Transportation Technology and Policy	G	This course is designed to educate and expose students to energy issues specific to developing countries. The course will focus on schemes to disseminate new technologies and provide hands-on practical experience in designing and implementing sustainable energy solutions. Students will apply basic engineering, social science, and business skills to evaluate a prospective project/venture through guest lectures, lab modules, and case studies. This is the first of a 2-part series focusing on energy in developing countries and is based on the MIT D-lab series. Lectures and reading assignments will present a brief history of energy use in the context of developing countries, tracing the rise of appropriate technologies and the role of government agencies, the private sector and non-governmental organizations in determining technology selection. Using a bottom-up approach, D-Lab student teams work with local communities to understand specific energy needs and assess the sustainability of proposed energy solutions through technical, social, environmental, and financial lenses. Areas of focus include water pumping and irrigation, post harvest drying and storage, off-grid lighting and micro power, and small-scale renewable energy such as solar and biogas. Multi-disciplinary teams are formed and communicate directly with local partners to perform feasibility studies for proposed energy solutions. They will present their findings with regard to scale, context, stakeholder analysis, and possible alternatives.	W11, W12, W13	
D-Lab II: Energy and Development: Designing for the Market	TTP 289A	Transportation Technology and Policy	G	How do you design for a developing country context? What are appropriate technologies? Are energy issues in developing countries technological, business-related, social, or political? Who is the customer? D-Lab II, Designing for the Market, is a studio-style class focusing on design approaches to overcome the barriers for the dissemination of energy technologies appropriate for the developing world. Student teams work with local partners and mentors, to design, prototype, and test scalable solutions for real world energy problems for their client communities. Collaboration with UCD faculty mentors, private sector experts, non-governmental organizations, and partner communities will serve to provide student teams with context and direction. Practical labs, case studies, and guest speakers will focus on user-centered and market-based design approaches. Students will form design focus groups to design, prototype, and test scalable solutions for their clients. Deliverables include a working prototype, 2 design reviews, and design notebook as a deliverable. D-lab II is the second of a 2-part series.	S11, S12, S13	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Path to Zero Net Energy - A Hands on Approach	TTP 289A	Transportation Technology and Policy	G	Through Lectures, field trips, guest speakers and hands-on labs students will understand the basic operation and control of common household and industrial energy consuming devices. This course complements the series of Energy Efficiency courses currently offered by the UC Davis Energy Efficiency Center. A brief overview of energy use in the US and the world will be presented as well as current trends and innovations for Zero Net Energy in the commercial and residential sectors. Students will engage in weekly participatory labs and lectures, listen to guest speakers, and make field trips, designed to promote a further depth of understanding of particular energy efficiency measures. Multidisciplinary student focus group teams will perform energy assessment for an actual client. Projects have included the UCD Domes retrofit, The UCD cool water storage, and the campus lighting initiative. Teams will present their findings and recommendations to a review panel for feedback.	S12, S13	
Emerging Issues at the Interface of Ecosystem, Animal and Human Health	VME 201	VM Medicine and Epidemiology	G	Principles of one health with emphasis on the relationships and interdependence of environmental, animal and human health. Exploration of critical data gaps needed to achieve sustainability in ecosystems and disease prevention. Lecture sessions include ecosystem change and impacts on animals and humans, cross-species disease transmission and emergence, wildlife zoonoses, wildlife population health, ecotoxicology, and tools and approaches for conducting ecosystem level studies and applied one health investigations.	W11, W12, W13	
Introduction to Ecosystem Health	VME 401	VM Medicine and Epidemiology	G	Introduce an integrated approach to understanding one health with emphasis on relationships and interdependence of environmental, animal and human health. Topics include ecosystem change and impacts on animals and humans, cross-species disease transmission and emergence, wildlife zoonoses, wildlife population health, ecotoxicology, and tools and approaches for conducting ecosystem level studies and applied one health investigations.	W11, W12	
Introduction to Conservation Biology	WFC 011	Wildlife, Fish, & Conservation Biology	U	Introduction to conservation biology and background to the biological issues and controversies surrounding loss of species and habitats for students with no background in biological sciences. Course covers: Biodiversity; How many species on earth and how many are being lost?; Exploitation of charismatic megavertebrates; International trade in wildlife; Biomes and ecosystems of significance for biodiversity; Habitat loss and how we assess it; Causes of historical habitat loss in North America; Causes of current habitat loss in Amazonia; Rarity, endemism and proneness to extinction; Genetic problems faced by small populations; Exotics and hybridization; Why conserve natural diversity? Biodiversity and ecosystem function; How do we conserve natural diversity?; Siting of reserves; How do we conserve natural diversity?: Reserve size, proximity, protectionism vs multiple-use in indigenous societies, management of the matrix; Ethics, laws and policies; Overlap between cultural and biological diversity; Role of agencies and local non-profits in conservation; Captive breeding programs; Reintroductions and bolstering wild populations; Habitat restoration; Conservation movements and environmental politics; International and US government conservation policies; Global warming; Population growth and land use change	S11, S13	
Physiological Ecology of Wildlife	WFC 130	Wildlife, Fish, & Conservation Biology	U	Principles of physiological ecology, emphasizing vertebrates. Ecological, evolutionary, and behavioral perspectives on physiological mechanisms used by animals to adapt to their environment, in the context of climate-change and other threats to biodiversity. Tropical, temperate, and polar ecosystems are highlighted. Course also looks at anthropogenic climate change: physiological plasticity in a changing world.	W11, W12, W13	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Ecology of Human—Wildlife Conflicts	WFC 152	Wildlife, Fish, & Conservation Biology	U	Ecological approaches to managing wild vertebrates that come into conflict with agriculture, public health, or the conservation of biodiversity. Course covers: Survey of conflicts between wildlife and humans. Attitudes toward problem wildlife. Concepts in ecology and behavior (habitat, carrying capacity, home range and dispersal, population growth, density dependence, niche, optimal foraging theory). Lethal control (methods, costs/benefits, population resilience, landscape issues, ecology loss, behavioral consequences). Translocation (concept, post-release behavior, homing, site fidelity, costs/benefits). Biological control (predation, parasitism, competition, costs/benefits). Fertility control (surgical, chemical, delivery systems, costs/benefits). Habitat manipulation (altering resources, altering conditions, altering foods, costs/benefits). Repellents (primary and secondary repellents, aversive conditioning, Batesian mimicry, aposematic coloration, costs/benefits). Exclusion (applications, costs/benefits). Scaring devices (visual, auditory, visual and auditory, costs/benefits). Cultivar resistance (applications, costs/benefits). Crop phenology (applications, costs/benefits). Integrated pest management (principles, cost-benefit analyses, case histories). Exotic species (species movements, mainland issues and solutions, island issues and solutions).	W11, W13	
Habitat Conservation and Restoration	WFC 155	Wildlife, Fish, & Conservation Biology	U	Analysis of the characteristics of wildlife and fish habitats, the conservation of habitats, and restoration. Course covers: importanceof wildlife and fish habitat conservation and restoration; Biodiversity processes and patterns; Biogeographic concepts; Ecosystem processes; Landscape processes; Environmental laws and regulations; Mechanisms of biodiversity loss; Recovery of endangered species; Wildlife and fish habitats; Approaches in habitat remediation, reclamation and restoration; Animal species introductions and reintroductions; Captive breeding and genetic conservation; Demographic restoration tools; The community approach; Habitat conservation planning; Reserve, corridor and matrix management approaches; Careers in wildlife and fish habitat conservation and restoration; Activities of agencies, non-profit organizations, and individuals; Mitigation and land banks.	W11, W12, W13	
Habitat Conservation and Restoration Laboratory	WFC 155L	Wildlife, Fish, & Conservation Biology	U	Analysis of the characteristics of wildlife and fish habitats, application of restoration methods, and evaluation of conservation and restoration projects in the field. Fundamentals of WFC 155 with lab work - students will participate during the term in a restoration project.	W11, W12, W13	

COURSES THAT INCLUDE SUSTAINABILITY

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Evolution of Societies and Cultures	ANT 105	Anthropology	U	Interdisciplinary study of social and cultural evolution in humans. Culture as a system of inheritance, psychology of cultural learning, culture as an adaptive system, evolution of maladaptations, evolution of technology and institutions, evolutionary transitions in human history, coevolution of genetic and cultural variation. Course includes a lesson on climate change and human evolution and a theme of the course is how population grown interacts with natural resources.	F10, S13	ECL 205
Economic Anthropology	ANT 122A	Anthropology	U	This course is the study of how people make a living in diverse ecologies and economies. The first part of the course focuses on individual decision making and how those decisions aggregate to produce economic change. The second part of the course focuses on economic decisions in different subsistence systems: foraging, herding, agriculture, and wage labor. The third part of the course focuses on cooperation and the management of natural resources, as well as the causes of inequality. Students learn about "tragedy of the commons" problems and how societies have succeeded or failed to solve them.	S11, S12, W13	
Anthropology of Development	ANT 126A	Anthropology	U	Theories of development and current critiques. Colonial legacies and post-colonial realities. Roles of the state and NGOs, population migrations, changing gender identities, cash-earning strategies, and sustainability issues. Stresses importance of cultural understandings in development initiatives. Case studies emphasizing non-industrial societies. Course themes include sustainable developoment and implications for the future.	W11, SS-1 2011, W13	
Birds, Humans and the Environment	AVS 013	Avian Sciences	U	Interrelationships of the worlds of birds and humans. Lectures, discussions, field trips and projects focus on ecology, avian evolution, physiology, reproduction, flight, behavior, folklore, identification, ecotoxicology and conservation. Current environmental issues are emphasized.	F10, F12, F13	
Writing Nature: 1750 to the Present	COM 120	Comparative Literature	U	Study of representations, descriptions and discussions of humankind's problematical relationship with the non-human world in texts written in a variety of European and American traditions between 1750 and the present. The course focuses on historical developments in our understanding of our relationship with nature as well as on the close reading of literary texts that relate to our interactions with the world. Sections on works by Bill McKibben.	W11, W12, F12	
Introduction to Design	DES 001	Design	U	DES001 introduces the concept of sustainability as a concern for designers today. We examine sustainable practices as an aspect of design's place in contemporary society, emphasizing the contexts of ethical decision-making for designers, design practices of use, re-use, & waste reduction, and the designer's consideration of potential ecological impacts of materials, manufacturing, and use of the products of design. Specific sustainability topics include: role of designer and products in contemporary culture including social responsibility and sustainability, sustainable materials and processes, interdisciplinary connections. The design of the final studio project for this course, a habitat for beneficial garden creatures, must incorporate evidence of sustainability in its design and use re-purposed materials in its construction.	F10, F11, F12	
Designing with Light	DES136B	Design	U	Design and manipulation of light sources, luminaires, and lighting controls to enhance the functional and aesthetic impact of interior and exterior spaces. Design projects explore lighting effects, light distribution characteristics, and lunminaire design. Students learn about the technical and aesthetic considerations involved in selecting and manipulating materials, optics and light distribution to create lighting systems that reflect good design principles in terms of form, function, energy efficiency, and visual appeal. Course includes social and technical aspects of energy efficiency.	W11, W12, W13	
Principles of Daylighting	DES 137A	Design	U	The impact of natural light on the built environment and methods to control glare and maximize energy savings. The course focuses on the effects of daylight in interior spaces, including psychological, biological and energy effects. Course objectives include understanding the effect of daylight on occupants' health and comfort, both in terms of vision and temperature. Students also learn to assess how daylighting designs affect energy efficiency and the perception of interior designs.	S11, S12, S13	
Daylighting Design Studio	DES 137B	Design	U	In DES 137B, students undertake a year-round daylight performance evaluation in a real space of their choosing and redesign the interior and/or building envelope to improve performance. The testing and evaluation is performed using real space and scale model photography on site as well as in CLTC's Heliodon. Through the course, students learn to conduct a thorough evaluation of daylight performance; identify advantages and disadvantages of a specific architectural/interior design; and think of ways to improve performance. The aim is to improve psychological, biological and energy performance. Studio topics include integration with electric lighting and daylighting and energy efficiency.	F10, F11, F12	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Textile Surface Design	DES 160	Design	U	Course includes a sustainability module on natural and/or disperse dyes. Students learn how to make an indigo dye bath with less environmentally impactful materials (lime and iron sulfate) instead of typical harsh chemicals. Students learn the disperse dye technique which creates color through a heat transfer process so that no water is needed. Students also learn dye processes using natural plant materials. Students experiment with found natural materials such as avocados and eucalyptus leaves.	F10, F11	
Experimental Fashion & Textile Design	DES 170	Design	U	Experimental approaches to fashion and textile design. Emphasis on developing conceptual ideas and translating them into one-of-a-kind garments and soft products. Course includes a focus on incorporating current issues in fashion & textile design including new technology, sustainability, political consciousness, social activism, and gender identity and formation.	S11, S12	
Theory and Issues in Design	DES 221	Design	G	Perspectives on theoretical and aesthetic issues related to the design professions such as methodology in historical and contemporary contexts, implications of technology on design theory and practice, and design relationships to environmental sustainability, recycling, and other social issues. The content will vary each year to present a timely perspective on the design professions. Topics covered may include: Design Sustainability: environmental, cultural, historical; New Technology: implications, issues, new materials and potential impacts; Form and Meaning: changing form as result of changing meaning/technology/social developments; Interdisciplinary issues in design; Feminist and/or Gender Theory in relation to design.; Material culture and consequences for well being.	F10, F11, F12	
Air Pollution Control System Design	ECI 150	Civil and Environmental Engineering	U	Project-based course covering the design of an integrated urban drainage system, including consideration of design alternatives, multiple realistic constraints (public safety, economic, environmental, sustainability and health), quantification of hydrologic uncertainty, codes and standards, design drawings and specifications and cost analysis.	W11, W12, W13	
Principles and Applications of Ecology	ECL 200A	Ecology	G	Provides a broad background in the principles and applications of ecology, and serves as a foundation for advanced ecology courses. Topics include ecophysiology, behavioral ecology, population ecology, genetics and evolution. Emphasis on historical developments, current understanding, and real world applications. The course covers four major subject areas: (1) Principles of ecophysiology in plants and animals. (2) Fundamentals of behavioral ecology, sexual selection, and life-history theory. (3) Principles of population dynamics for single and interacting species in populations and metapopulations. (4) Population genetics and evolutionary ecology. The course will have a theoretical emphasis but will be illuminated with extensive reference to the details of particular systems in nature, empirical studies, and real World uses of ecology to solve problems. These applications include ecosystem management, conservation and agriculture. Lectures aim to provide historical development, underlying principles, a synthesis of current empirical knowledge, and applications. Discussions complement and build on lecture materials and are led by students who give reviews of the instructor-selected papers and facilitate discussion with questions for the group.	F10, F11, F12	
Principles and Applications of Ecology	ECL 200B	Ecology	G	Principles and applications of ecology, continuing topical coverage from ECL200A. The course covers principles of community structure and functioning, species diversity patterns, ecosystem ecology and biogeochemistry, landscape ecology, biogeography and phylogenetics. The course covers six subject areas: (1) The course covers principles of community structure and functioning: diversity, stability, food webs, indirect interactions, maintenance of species diversity and trophic cascades. (2) Biogeography, phylogenies and biodiversity gradients. (3) Restoration ecology. (4) Landscape ecology. (5) Biogeochemistry and global climate. (6) Paleoecology. Lectures aim to provide historical development, underlying principles, a synthesis of current empirical knowledge, and applications. Discussions complement and build on lecture materials and are led by students who give reviews of the instructor-selected papers and facilitate discussion with questions for the group.	W11, W12, W13	
Community Ecology	ECL 205	Ecology	G	Introduction to literature and contemporary research into processes structuring ecological communities. This course is intended to give entry level graduate and advanced undergraduate students an introduction to literature and contemporary research involving processes structuring ecological communities. Some topics covered include food webs, biotic interactions, experiments in ecology, community level models of population dynamics and community structure, and trophic cascades and nutrient dynamics. The course also covers sustainability topics: biodiversity, keystone species, and ecosystem functions; causes of biodiversity; maintenance of biodiversity; and conservation of biodiversity.	W11, W12	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Environmental Policy Analysis	ECL 212A	Ecology	G	Methods and practices of policy analysis; philosophical and intellectual bases of policy analysis and the political role of policy analysis. Some topics covered include systems theories of the policy process, institutional rational choice, the Commons Dilemma, actor-based perspectives, policy instruments, and environmental policy implementation. The course includes a section on advocacy coalition frameworks applied to examples in Tahoe and OCS drilling and nuclear waste.	F11, S13	ESP 212A
Environmental Policy Analysis Evaluation	ECL 212B	Ecology	G	Methods and practices of policy analysis; philosophical and intellectual bases of policy analysis and the political role of policy analysis. Some topics covered include different approaches to policy analysis, multiattribute decision analysis, analysis of uncertainty, risk assessment, and equity analysis. Case studies are examined. The course includes a section on the valuation of environmental and ecosystem effects (non-market goods).	S12	ESP 212B
Ecology and Agriculture	ECL 216	Ecology		Ecological principles and relationships as applied to agriculture. Integration of ecological approaches into agricultural research to develop environmentally sound management practices. Topics include crop autoecology, biotic interactions among crops and pests, crops systems ecology, differences between functioning of natural and agricultural systems, ecological changes after cultivation of natural ecosystems, productivity in water-limited agricultural environments: responses to drought in dryland pasture plants, and world food demand and effects of changing atmospheric and climatic conditions.	F10, F12	
Combustion and the Environment	EME 161	Mechanical Engineering	U	Introduction to combustion kinetics; the theory of pre-mixed flames and diffusion flames; turbulent combustion; formation of air pollutants in combustion systems; examples of combustion devices which include internal combustion engines, gas turbines, furnaces and waste incinerators; alternative fuel sources. Course includes lessons on the environmental impact of combustion systems and alternative fuels.	S12, W13	
Internal Combustion Engines and Future Alternatives	EME 163	Mechanical Engineering	U	Fundamentals of internal combustion engine design and performance. Future needs to adapt to environmental concerns, and the feasibility of better alternatives in the future. Class includes a section on alternative fuels (natural gas, alcohols, biofuels, hydrogen) and pollution control (nitrogen oxides, unburned hydrocarbons, particulate emissions, exhaust gas treatment).	S11	
Introduction to Environmental Horticulture/Urban Forestry	ENH 001	Environmental Horticulture and Urban Forestry	U	Introduction to the use of plants to enhance the physical, visual and social environment. The use of ecological principles in developing sustainable, low maintenance landscape systems will be presented. Career opportunities will be discussed.	F10, F11, F12	
Trees of the Urban Forest	ENH 101	Environmental Horticulture and Urban Forestry	U	Identification and evaluation of 200 tree species of the urban forest on campus, in the Arboretum, and in the city of Davis; appraised and aesthetic values, condition, and branch structure; contribution of trees to this ecosystem. Bicycle required. Topics covered include tree contributions to the ecosystem such as shade and energy conservation, carbon dioxide sequestration, water	F10	
Trees and Forests	ERS 144	Environmental and Resource Sciences	U	Biological structure and function of trees as organisms; understanding of forests as communities and as ecosystems; use of forests by humans; tree phenology, photosynthesis, respiration, soil processes, life histories, dormancy, forest biodiversity, and agroforestry. Topics covered include sustainable forest management, forest decline and agroforestry.	F10	
Trees and Forests	ESM 144	Environmental Scence and Management	U	Biological structure and function of trees as organisms; understanding of forests as communities and as ecosystems; use of forests by humans; tree phenology, photosynthesis, respiration, soil processes, life histories, dormancy, forest biodiversity, and agroforestry. Topics covered include sustainable forest management, forest decline and agroforestry.	F11, F12	
General Ecology	ESP 100	Environmental Science and Policy		Theoretical and experimental analysis of the distribution, growth and regulation of species populations; predator-prey and competitive interactions; and the organization of natural communities. Course includes application of evolutionary and ecological principles to selected environmental problems.	W11, F11, SS-1 2012	
Plant Conservation Biology	ESP 127	Environmental Science and Policy	U	Principles governing the conservation of plant species and plant communities, including the roles of fire, exotic species, grazing, pollination, soils, and population genetics; analytic and practical techniques for plant conservation; and introduction to relevant legal, ethical, and policy issues. Topics covered include different tools for conserving plant diversity: a. hotspot analysis and similar tools, b. population viability analysis, c. restoration of species and ecosystems, d. the Endangered Species Act and other relevant laws, and e. traditional ecological knowledge.	W11, W13	
Methods of Enviornmental Policy Evaluation	ESP 168A	Environmental Science and Policy	U	Evaluation of alternatives for solution of complex environmental problems; impact analysis, benefitcost analysis, distributional analysis, decision making under uncertainty, and multi-objective evaluation. Course features case studies on climate change policy in California and also teaches concepts for making decisions in complex environmental environments.	F10, F11, F12	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Urban and Regional Planning	ESP 171	Environmental Science and Policy	U	How cities plan for growth in ways that minimize environmental harm. Standard city planning tools (general plan, zoning ordinance) and innovative new approaches. Focus on planning requirements and practices in California. Relationships between local, regional, state, and federal policy. Specific topics include: history of city planning, the legal basis for city planning, planning institutions, General Plan requirements, General Plan implementation, the California Environmental Quality Act (CEQA), growth management strategies, agricultural land preservation, conservation and habitat planning, natural hazards planning.	S11, S12, S13	
Environmental Policy Analysis	ESP 212A	Environmental Science and Policy	G	Methods and practices of policy analysis; philosophical and intellectual bases of policy analysis and the political role of policy analysis. Some topics covered include systems theories of the policy process, institutional rational choice, the Commons Dilemma, actor-based perspectives, policy instruments, and environmental policy implementation. The course includes a section on advocacy coalition frameworks applied to examples in Tahoe and OCS drilling and nuclear waste.	F11, S13	ECL 212A
Environmental Policy Analysis Evaluation	ESP 212B	Environmental Science and Policy	G	Methods and practices of policy analysis; philosophical and intellectual bases of policy analysis and the political role of policy analysis. Some topics covered include different approaches to policy analysis, multiattribute decision analysis, analysis of uncertainty, risk assessment, and equity analysis. Case studies are examined. The course includes a section on the valuation of environmental and ecosystem effects (non-market goods).	S12	ECL 212B
Introduction to Environmental Toxicology	ETX 010	Environmental Toxicology	U	Hazardous substances, their effects on humans and their actions and movement in the environment. Emphasis on substances of current concern. Course covers historical examples, natural substances, marine and plant toxins, industrial chemicals, tobacco and cancer, and pesticides. Course includes sections on chemicals in the environment, global warming and ozone depletion, and oil in the ocean.	F10, F11, F12	
Principles of Environmental Toxicology	ETX 101	Environmental Toxicology	U	Principles of toxicology with a focus on environmental, industrial, and natural chemicals. Topics include fate and effects of chemicals in organisms and the environment, insecticides, aquatic toxicology, endocrine disruptors, biomarkers and bioassays, and risk assessment. Course includes sections on environmental toxicology, environmental pollutants, and environmental aspects of toxicology - environmental fate of chemicalsa and air, soil, and water pollution.	F10, F11, F12	
Environmental Fate of Toxicants	ETX 102A	Environmental Toxicology	U	Properties of toxic chemicals influencing their distribution and transformations; action of environmental forces affecting toxicant breakdown, movement, and accumulation; sources and occurrence of major classes of environmental toxicants. Course looks at occurrence of toxic chemicals, chemical properties, and physical properties. Course includes section on global warming, oil pollution, and dioxins.	W11, W12, W13	
Perspectives in Aquatic Toxicology	ETX 120	Environmental Toxicology	U	Toxic substances, their fate in marine and freshwater systems, and their effects on aquatic organisms, populations, and ecosystems. Emphasis will be on substances and issues of current concern. Course includes sections on natural and anthropogenic toxicsubstances, reproductive and hormonaleffects, indicators of ecosystem health, and conservation.	W11, W13	
Ecotoxicology	ETX 240	Environmental Toxicology	G	Principles of toxicology as applied to chemical action on natural populations, communities, and ecosystems. Physical, chemical, and biological characteristics which influence ecotoxic effects, modeling, and field research. Selected case histories are analyzed and presented in class. Course includes lectures on interactions between climate change and pollutants and community effects and indirect effects of pollutants. Topics covered in the class include interaction of climate change and ecotoxicity in high latitudes, how community interactions buffer or sensitize species to contaminant impacts, and ecological implications of nanomaterials.	S13	
Toxicology of Pesticides	ETX 270	Environmental Toxicology	G	Classification and chemical properties of pesticides, their mode of action, metabolism and disposition, pesticide resistance, effects on human health and ecological health and methods of risk benefit analyses. Pesticides are a very important group of chemicals extensively used in agriculture, public health and urban activities. Modern pesticides used today are the products of very sophisticated designing and formulation in order to avoid their unwanted or secondary effects. Indeed, pesticides represent a class of chemicals that are most critically scrutinized by advanced societies as compared to other types of chemicals used today. Furthermore, recent advances in pesticides include the use of genetically engineered biocides, chirally pure isomers and combinations of different types of chemicals, such as safeners, pheromones and biocontrolling agents. On the side of evaluation of their toxicities, the approaches on their risk assessment are also becoming highly sophisticated. Course sections include the effects of pesticides on human health, the environmental effects, and the risks and benefits of pesticides.	W11	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Marine Environmental Issues	EVE 111	Evolution & Ecology	U	An examination of critical environmental issues occurring in coastal waters. Course links together material from concurrent courses at BML to develop an integrative understanding of marine environments and their conservation. Includes readings, group discussions, and interaction with visiting speakers. The course aims are to provide an integrative understanding of marine environments, to allow students to appreciate how their focused studies sit in the context of larger environmental issues, and to allow students to grapple with "real world" issues. Further, this course will give students the opportunity to meet outside experts. The specific material and visitors will be selected to represent major environmental themes, such as environmental change (e.g., climate change, coastal development), resource utilization (e.g., fisheries, marine protected areas), or environmental quality (e.g., pollution).	SS-1 2010; SS-1 2011; SS-1 2012	
Marine Ecology	EVE 115	Evolution & Ecology	U	Processes affecting the distribution, abundance, and diversity of plant and animal life in the sea. Introduction to marine habitat diversity and human impacts on marine ecosystems. The course lectures will consist of four main sections: 1. The physical, chemical and biological setting for life in the sea (basic oceanography, physics of flow, elementary biomechanics, life histories and marine organismal biology). 2. Patterns and processes in open water systems (e.g., microbial vs. classical food webs; upwelling and primary productivity; pelagic fisheries). 3. Patterns and processes in benthic systems (e.g., succession, disturbance, competition, predation, herbivory, facilitation, recruitment limitation, indirect effects in a a range of environments, including intertidal and subtidal habitats). The last section, 4. A synthetic section, includesbiodiversity, land-sea exchange, global change, and human impacts on the sea.	W11, W13	
Plant Ecology	EVE 117	Evolution & Ecology	U	The study of the interactions between plants, plant populations or vegetation types and their physical and biological environment. Special emphasis on California. Four full-day field trips and brief write-up of class project required. Class includes sections on resource allocation, water as a lmiting factor, communities and ecosystems, and global environmental change.	F10, F11, F12	
Geology of Campus Waterways	GEL 091	Geology	U	Research characterizing geological processes in waterways on campus including links among hydrologic, atmospheric, physical, and human processes; carbon cycling and interpreting processes from sediments; field research techniques; research project design and implementation; implications of results for society and environmental policy. Course covers water monitoring, field research methods, data collection, interpreting data, carbon cycling, sedimentation, and links among hydrologic, atmostpheric, and physical processes. In the remaining lessons students learn natural versus anthropogenic influences on waterways and implications for society and environmental policy.	W11	
Historical Ecology	GEL 144	Geology	U	Ancient ecosystems and the factors that caused them to change. Species, expansion, evolution of new modes of life, geologically induced variations in resource supply, and extinction provide historical perspective on the biosphere of future. Modern processes and principles of ecology. The nature of the fossil record. Course also includes sections on the history and effects of climate change (temperature, diversity, productivity, the control of climate by life) and current problems (ocean acidication, climate warming, habitat fragmentation).	W11, W13	
Landscape Meaning	LDA 001	Landscape Architecture	U	This course is an overview to Environmental Design, including the allied professions of Landscape Architecture, Architecture, Urban Design, and Planning. It includes an investigation of the role of design professionals in contributing to the built environment at a range of scales and locations, through case studies of historic and contemporary projects. Particular focus will be given to the discipline of landscape architecture as an interdisciplinary field, exploring its historic evolution, highlighting its interaction with arts and sciences, and examining its contemporary leaders. Lastly, this course will provide an introduction to basic methods used by environmental design professionals to evaluate, design, plan, and manage landscapes and the built environment. Lecture topics include ecological-based approaches in environmental design, the role ofecology in enviornmental design, and the role of ethics and sustainability in environmental design.	F10, F11, F12	
Site Planning and Design Studio	LDA 170	Landscape Architecture	U	Formal issues in landscape architecture (scale, space and form); design process in landscape architecture; site planning; visual communication in landscape architecture (graphics); verbal communication in landscape architecture (speaking and writing) cultural information/cultural data affecting landscape architectural; design community participation processes; and policy and regulations affecting landscape architectural design landscape architecture beyond Davis/Sacramento environs . Course includes environmental issues affecting landscape architectural design and site design strategies to improve sustainability.	F11, F12	

Name	Course #	Department	Level	Description	Qtrs Offered	X list
Special Topics in Landscape Architecture: Landscape and Regional Land Planning	LDA 180G	Landscape Architecture	U	Theories, laws, and practices of community planning. Creation of livable and sustainable communities and natural landscapes, Smart growth, new urbanism, neo-traditional town planning, transit-oriented, and sustainable communities. Traditonal master planning vs. participatory planning and design approaches. Coures includes lesson on learning how theories are applied in a livable and sustainable environment and how to interpret and create a sustainable landscape and livable sustainable community.	W11	
Landscape Ecology and Design Planning Studio	LDA 181F	Landscape Architecture	U	Design theory and methods to real-world projects in ecology. Ecological principles and their application in biological conservation, ecological restoration, and landscape planning, design, and management. Field trip required. Course lesson topics include landscape disturbance, stability, and change; animal and plant movement across landscapes - Landscape fragmentation; landscape planning, design and management for conservation; and restoration of degraded landscapes	W12	
Special Topics in Landscape Architecture: Landscape and Regional Land Planning Studio	LDA 181G	Landscape Architecture	U	Applications of recent models and practices of urban planning and design to create livable and sustainable cities, towns, villages, rural, and natural landscapes. Testing of models by creating plans and designs for new communities, and for urban infill, restoration or redevelopment projects. The course is offered as a planning and design studio for Landscape Architecture students, Community Development and Geography graduate students and others with the skills necessary to produce architectural designs. Studio project 1 is an in-depth physical planning project that uses a GIS based data set to complete a large scaled regional or sub-regional planning exercise. Students will work in teams to develop conceptual modeling skills, develop strategies to determine land capabilities, identify natural protection areas, and develop suitability models for circulation and land use components of a master plan.	W11	
Landscape Architecture Planning & Design Studio	LDA 191	Landscape Architecture	U	Faculty initiated workshops featuring advanced studies and applications of original work in landscape architecture. Students learn establishment of project parameters; site and program analysis and refinement; planning and design process; execution of approved plan; documentation and presentation; and evaluation of results. Course covers a variety of landscape design strategies for sustainability at different scales.	W11, F11	
Landscape Conservation	LDA 280	Landscape Architecture	G	Focus is on land planning, design, and management techniques to further the goal of resource preservation.	W11, W13	
Advanced Energy Systems	MAE 218	Mechanical and Aeronautical Engineering	G	Review of options available for advanced power generation. Detailed study of basic power balances, component efficiencies, and overall powerplant performance for one advanced concept such as a fusion, magnetohydrodynamic, or solar electric powerplant. Course includes lessons on harvesting and transmitting power via wind solar andbiomass conversion.	F11	
Fuel Cell Systems	MAE 269	Mechanical and Aeronautical Engineering	G	Basics of electrochemistry and fuel cell engines in mobile and stationary applications. Aspects of fuel cell energy converters and their subsystems including practice with existing fuel cell and hydrogen systems on campus. Course covers sustainable pathways for producing hydrogen, including solar wind and biomass.	F10, F12	
Community Development for Sovereignty and Autonomy	NAS 212	Native American Studies	G	Beginning with a foundational sample of classic works in political economy, we will examine how stories about capitalism and neoliberalism have shaped traditional development theory and planning. In juxtaposition to mainstream discourses of philanthropy & aid undergirding development interventions, we explore alternative funding paradigms for endogenous and community-based development efforts. Case studies will then highlight strategies employed by contemporary indigenous communities across the Americas to develop, finance and implement autonomous and sovereign forms of governance. As a collective, we will be following the unfolding “Idle No More” movement and its relation to other regional indigenous movements for self-determination. Students write a research paper on topics explored in class, such as fair trade, social entrepreneurship dogma, and the greenwashing of "social corporate responsiblity." General themes explored in the class include land/territory, sovereignty, and human rights as related to indigenous development.	S13	
Diseases of Fruit, Nut, and Vine Crops	PLP 206A	Plant Pathology	G	Clinical study of fruit, nut, and vine crops diseases with emphasis on etiology, epidemiology, diagnosis, and control. Course includes sustainable management of diseases of perennial crops.	S11, S13	
Environmental Interactions of Cultivated Plants	PLS 100C	Plant Sciences	U	Principles of plant interactions with their physical and biological environments and their acquisition of the resources needed for growth and reproduction. Emphasis on how management practices and environmental conditions affect crop productivity. Course covers sinks such as carbon sequestration, California water issues, including irrigation, consumption, contamination, and regulatory issues, and environmental stress on plants.	S11, S12	

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Principles of Agronomic Crop Production in Temeprate and Tropical Systems	PLS 110A	Plant Sciences	U	Fundamentals of field crop production in temperate and tropical climates. Resource utilization and economic, political and social problems are considered in relation to technological problems and their influences on agricultural development. Part two of this course focuses on the interaction with environmental factors limiting production: Climate and crop geography; The soil environment of crops; Light, temperature, and moisture requirements; and the sustainability of agriculture.	F11	
Crop Management Systems for Vegetable Production	PLS 110C	Plant Sciences	U	Horticultural principles applied to production and management systems for vegetable crops. Laboratory and discussion will illustrate efficient field management and resource use practices. Part one of class includes role of vegetable crops in food systems and human nutrition. Part three of the course includes water management, drought, and pest management.	F10, F12	
Forage Crop Ecology	PLS 112	Plant Sciences	U	Forages as a world resource in food production. Ecological principles governing the adaptation, establishment, growth and management of perennial and annual forages, including pastures, rangelands and hay; aspects of forage quality which affect feeding value to livestock. Topics covered include nutrient cycling inmanaged grassland systems; water requirements, irrigation methods, and water management problems; conservation, supplementation, and feed-year budgeting; and concepts of efficiency in forage-livestock systems.	S11	
Ethnobotany	PLS 141	Plant Sciences	U	Relationships and interactions between plants and people, including human perceptions, management, and uses of plants, influences of plants on human cultures, and effects of human activity on plant ecology and evolution. Concepts, questions, methods, and ethical considerations in ethnobotanical research. Course includes the ethical, political, and enviornmental considerations related to plants, such as conservation.	W11	
Trees and Forests	PLS 144	Plant Sciences	U	Biological structure and function of trees as organisms; understanding of forests as communities and as ecosystems; use of forests by humans; tree phenology, photosynthesis, respiration, soil processes, life histories, dormancy, forest biodiversity, and agroforestry. Course includes sustainable forest management, and agroforestry.	F10, F11, F12	
Mineral Nutrition of Plants	PLS 158	Plant Sciences	U	Evolution and scope of plant nutrition; essential elements; mechanisms of absorption and membrane transporters; translocation and allocation processes; mineral metabolism; deficiencies and toxicities; genetic variation in plant nutrition; applications to management and understanding ecological effects of nutrient availability or deficiency. Plant nutrition is a unique integrating discipline that brings together biology, agriculture, ecology from molecular principles to ecosystem function. Topics covered include plant nutrition as it relates to human health, agricultural sustainability, and ecological processes.	S11, S13	
Introduction to Weed Science	PLS 176	Plant Sciences	U	Principles of weed science including: Weed biology and ecology, methods of weed management, biological control, herbicides and herbicide resistance. Weed control in managed and natural ecosystems; invasive species. Laws and regulations. Application of herbicides. Sight identification of common weeds. Topics covered include integrated pest management and environmental implications relating to herbicides.	W11, W12, W13	
Critical Inquiry into Contemporarary Issues	SAS 001	Science and Society	U	Contemporary issues, including global population trends, economic and environmental changes, cultural diversity and biodiversity, nutrition and food safety, fiber and textiles, changing consumer cultures. Inquiry processes emphasize ethics, multiple disciplines, and multiple perspectives.The theme for the first part of the course is Science and Changing Populations: Toward Integrative Understanding and includes environmental issues and standpoints, topics on food and culture and food satefy, and ethics.	F10. F11, F12	
Feeding the Planet: Influences on the Global Food Supply	SAS 002	Science and Society	U	Scientific principles and dynamic interactions involved in food production, food processing, nutrition, shelf life and marketing from differing viewpoints. Physical, biological and social science issues influencing the availability, safety, and sustainability of the food supply worldwide. Topics covered include agriculture's turning points such as the Green Revolution and Haber-Buschnitrogen synthesis, human population and future food production, farming sustainability, basics of human nutrition, agricultural economics, and global warming.	W11, W12, W13	
Water Quality at Risk	SAS 008	Science and Society	U	Natural and human threats to water quality. Balance of science and policy in all aspects of attaining, maintaining, and managing water quality, water contamination. Decoding popular media coverage of water quality and water contamination. Lesson topics covered include 1. water quality framework: Science, Policy, Stakeholders, Institutions.; 2. Groundwater issues, contamination and lag times.; 5. Industrial contaminants.; 6. Agricultural contaminants.; 7. Natural contaminants.; 8. Surface water issues.; 9. Clean Water Act, water quality Standards, and Total Maximum Daily Loads.; 12. Coastal issues.	W11, W12, W13	

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Food Distribuition in a Hungry World	SAS 090F	Science and Society	U	The biological, technological, environmental, and socioeconomic factors related to food distribution systems at local, regional, national, and international levels. The potential for increasing world food supply by reducing losses between harvest and consumption. Week 4: Environmental factors affecting deterioration rates such as temperature, relative humidity, and atmospheric composition. Week 5: Demonstrations of how biological and environmental factors influence deterioration rates of fresh fruits and vegetables. Weeks 6 and 7: Socio-economic factors such as inadequate marketing systems, transportation facilities, governmental regulations, and legislation.	F10, F11	
Soils in Our Environment	SSC 010	Soil Science	U	Soils in our global ecosystem; soils as natural bodies formed by interactive environmental processes; soil response to use and management; sustainable use of soil resources; role of soils in agricultural and environmental issues; role of soils in our daily lives. Parts 7, 8, 9, and 10 of the course cover soils and land use - soil capabilities and distribution, soil conservation and reclamation, role of soils in environmental issues, and soils in sustainable agriculture.	F10, F11, F12	
Field Studies of Soils in California Ecosystems	SSC 105	Soil Science	U	Field-based studies of soils in California ecosystems, away from campus, with travel throughout much of California. Emphasis on description and classification of soils; physical, chemical, and biological processes active in soils and landscapes; and the role of soils in land use. Course topics also include relationships among soils, vegetation, geology, and climate; The course is approximately three weeks in length each summer, and alternates annually between northern and southern California.	Summer session special 2010, 2011, 2012	
Field Studies of Soils in California Ecosystems	SSC 205	Soil Science	U	Field-based studies of soils in California ecosystems, away from campus, with travel throughout much of California. Emphasis on description and classification of soils; physical, chemical, and biological processes active in soils and landscapes; and the role of soils in land use. Course topics also include relationships among soils, vegetation, geology, and climate; The course is approximately three weeks in length each summer, and alternates annually between northern and southern California.	Summer session special 2010, 2011, 2012	