

## Environmental Studies and Planning (ENSP)

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### ENSP 200 GLOBAL ENVIRONMENTAL ISSUES (3)

Lecture-discussion, 3 hours. An introduction to environmental studies and planning, including humans in relation to the global ecosystem: an overview of problems of energy use, pollution, resource depletion, population growth, food supply, urbanization, climate change, and biodiversity and the search for solutions and future prospects. Satisfies GE, category D5 (Contemporary International Perspectives). Prerequisite or Corequisite: enrollment in ENGL 101 or PHIL 101.

### ENSP 201 ENVIRONMENTAL FORUM (1)

Regular weekly departmental lecture series. Outside professional speakers and alumni report on environmental topics and opportunities for environmental action. Cr/NC only.

### ENSP 202 QUANTITATIVE METHODS: ENV STUDIES (3)

Lectures and workshop designed to enhance students' confidence in analytical problem solving. Essential techniques emphasizing environmental applications: translating knowledge into abstract and mathematical models, numerical estimates, basic geometry and trigonometry, dimensional analysis, unit conversions, interpreting statistical data, graphic display of information; and conceptual introduction to calculus, differential equations, and complex numbers. Prerequisite: completion or concurrent enrollment in GE category B4 (Math Concepts). Cr/NC only.

### ENSP 301 THE HUMAN ENVIRONMENT (3-4)

This course is designed to explore environmental issues and their impact to/on/by humankind. The class will demand that each student contribute ideas from his/her own experience each class session, as well as doing an in-depth group research project on an issue that involves human interaction with the environment. Issues could include effects of human technology and social institutions upon the natural environment as well as beliefs, values, attitudes in relation to human and non-human environment. Prerequisite: ENSP 200 or equivalent and junior standing.

### ENSP 302 APPLIED ECOLOGY (3-4)

This course explores major concepts of ecology and examines current environmental issues in light of these concepts. Topics include relationship between organisms and the physical environment, community-level ecological processes, the structure and function of ecosystems and their distribution on the planet, evolutionary processes, and population ecology. Environmental issues include loss of biodiversity, global climate change, invasive species, and others. Development of speaking and writing skills is a significant element of the course. Field trip required. Prerequisite: completion of GE Category B2 (Biological Sciences) or consent of instructor.

### ENSP 303 APPLIED PHYSICAL SCIENCE (3-4)

A review of the physical field sciences for environmentalists. Develops an understanding of the problems and challenges in environmental control of air, water, soil, natural hazards, and nonrenewable resources by applying scientific principles to practical environmental problems. Prerequisite: completion of lower-division GE categories B1 (Physical Sciences) and ENSP 200.

### ENSP 305L COMPUTER-AIDED COMMUNICATIONS (3)

Designed to introduce ENSP students to theory and techniques of computer-aided environmental communication. The fundamentals of visual and audio communication will be addressed, demonstrated, and applied through a variety of instructional technologies. Web tools, presentation graphics, digital photography, and desktop publishing are the areas primarily addressed.

### ENSP 306 ENVIRONMENTAL ETHICS (3)

An examination of philosophical issues; concepts of extending rights to nonhuman entities of nature and the question of humans' place in nature; logical and conceptual foundations for an environmental ethic. Prerequisite: completion of GE category A (Communication and Critical Thinking).

### ENSP 307 ENVIRONMENTAL HISTORY (4)

History of the American environment and the ways in which different cultural groups have perceived, used, managed, and conserved it from Colonial times to the present. Changes in attitudes and behavior toward nature and the conservation/environmental movements are also examined. Prerequisite: Completion of GE category A (Communication and Critical Thinking).

### ENSP 308 ENVIRONMENTAL LITERATURE (3)

A survey of great American environmental books, including H. D. Thoreau's *Walden*, John Muir's *Mountains of California*, and more recent works by Mary Austin, Edward Abbey, Annie Dillard, and other environmental authors. The natural, political, artistic, and historical environment of the writers, and cultural results of the environmental movement in various major periods. Prerequisite: completion of GE, category C2 (World Literature).

### ENSP 309 SOIL SCIENCE (3-4)

An introduction to soil science emphasizing applications to agronomy, archaeology, botany, ecology, engineering, geography, geology, land use planning, hazardous materials management, and water quality. Technical exercises emphasize low-cost scientific analytical equipment. Prerequisite: completion of GE, category B (Natural Science and Mathematics).

### ENSP 310 INTRODUCTION TO PLANNING (3)

An overview of land use planning and associated concerns, such as transportation, open space preservation, housing, economic development, environmental protection, urban design, and public finance. Consideration of the evolving forms and functions of cities, towns, and rural areas and society's attitudes toward development, environmental concerns, and the appropriate role of government in regulating land use. Course addresses general plans, zoning, growth management, environmental impact assessment, and the local political process relating to planning. Current trends in planning and sustainable community development.

### ENSP 311 PLANNING THEORY AND METHODOLOGY (4)

Exploration of evolving planning thought and processes as a basis for understanding planning practice: comprehensive planning, incremental, and communicative action models; planning and local politics; the values and ethics of the professional planner; mediating environmental and land use disputes; basic analytical, methodological, and communication skills utilized in urban, environmental, and business planning.

### ENSP 314 URBAN DESIGN I: THE URBAN FORM (3)

An exploration of the physical and visual form of urban communities. The appearance and aesthetic qualities of public open spaces, streets, buildings, neighborhoods, city gateways, signs, and other elements of the urban scene. Meaning of "sense of place." The effects of public policy and regulations on urban form. The scale, pattern, and image of urban form elements. Planning for new communities, historic preservation, urban plazas, and public art. Prerequisite: ENSP 310 is recommended.

### ENSP 315 ENVIRONMENTAL IMPACT REPORTING (3)

The practice and theory of environmental impact assessment and analysis. The process of preparing environmental impact reports (EIRs) and statements (EISs) as mandated by state and federal statutes and regulations. Reviewing and commenting on environmental documents. Relationship between EIRs and comprehensive planning activities. Litigation of EIRs and environmental mediation. Prerequisite: ENSP 310 is recommended.

#### ENSP 322 CONSERVATION BIOLOGY (3-4)

Interdisciplinary investigation into biological, management, economic, and ethical issues associated with the current extinction of species. Course will cover principles and applications of ecology, population biology and genetics, biogeography, and social sciences for protection and management of biodiversity in the face of current widespread alteration of the environment. At least one field trip required. Prerequisites: ENSP 302, BIOL 122 or permission of instructor and junior or senior standing only.

#### ENSP 324A AGROECOLOGY (2)

The Agroecology course focuses on the study and practice of sustainable agriculture. Fall topics include soil testing, composting, seed beds for winter crops, planting green manure crops, and pest control. Environmental concerns concentrate on genetic diversity, seed saving, and decreased dependence on chemical pesticides and herbicides. Class time is divided between classroom lectures/discussions and field research/experimentation.

#### ENSP 324B AGROECOLOGY (1-2)

The Agroecology course focuses on the study and practice of sustainable agriculture. Spring topics include composting green manure, preparation of greenhouse seed beds, pest and weed control, and spring planting in open beds. Environmental concerns concentrate on large-scale irrigation, greenhouse management, fruit, nut, and forest production, and health effects of pesticides and herbicides. Class time is divided between classroom lectures/discussions and field research/experimentation.

#### ENSP 326A NATIVE PLANT PROPAGATION (1-2)

Field course in applied aspects of propagation of plants native to the local area. Topics include native plants and plant communities; techniques for collecting, growing, and planting native plants; and ecologically sound guidelines for collection and reintroduction of native plants. Experimental approaches to improve propagation success are emphasized. Course provides native stock for restoration of local riparian habitats.

#### ENSP 326B NATIVE PLANT PROPAGATION (1)

Field course in applied aspects of propagation of plants native to the local area. Topics include native plants and plant communities; techniques for collecting, growing, and planting native plants; and ecologically sound guidelines for collection and reintroduction of native plants. Experimental approaches to improve propagation success are emphasized. Course provides native stock for restoration of local riparian habitats.

#### ENSP 330 ENERGY, TECHNOLOGY & SOCIETY (4)

A lecture/discussion course designed to assist students in understanding energy as a fundamental measure of organization, structure, and transformation in society. Principal topics include energy history; thermodynamics; energy resources and conversion technologies; global issues and trends; environmental impacts; energy economics, institutions, and politics. Elementary quantitative analysis. Prerequisite: ENSP 202 or equivalent; may be taken concurrently.

#### ENSP 337 THERMAL ENERGY MANAGEMENT (3-4)

An introduction to energy management in residential and commercial buildings, focusing on space heating and cooling and hot water. Fundamentals of heat transfer, thermal properties of building materials, building load calculations, and energy economics. Strong algebra background and PHYS 210A recommended.

#### ENSP 338 ELECTRICAL ENERGY MANAGEMENT (3-4)

An overview of energy management approaches in residential and commercial settings that involve electrical devices, including lighting, motors, and HVAC. Fundamentals of electricity, electric power delivery, and the workings of common appliances; and energy economics. Strong algebra background and PHYS 210 recommended.

#### ENSP 345 PORTFOLIO DEVELOPMENT AND REVIEW (3)

Course designed to introduce students to critical issues in elementary education as well as to conduct an initial assessment of students entering ENSP multiple subject education program. Students develop portfolios and present to classmates. Majors only or consent of instructor. Field trips. Cr/NC only. Recommended for juniors. Course fee.

#### ENSP 350 HAZARDOUS MATERIALS MANAGEMENT (3)

Through lecture, discussion, and guest experts, the scope of the newly evolving field of hazardous materials management is discussed. Includes such topics as the public's right to know; environmental auditing; emergency response planning; transfer, storage, and treatment facilities; update of local and regional public agencies' activities; and career development for students. Prerequisite: ENSP 200 or equivalent.

#### ENSP 360 ASSISTANCE PROJECTS (1-4)

Involvement in on-campus environmental and planning activities. Requires preapproval of activities by faculty supervisor.

#### ENSP 395 COMMUNITY INVOLVEMENT PROGRAM (1-4)

Involvement in human, social, biological, or physical problems of the off-campus community. A total of 6 units may be applied toward the degree.

#### ENSP 399 STUDENT INSTRUCTED COURSE (1-3)

Topic will differ each semester.

#### ENSP 400 SELECTED TOPICS (1-4)

Intensive study of selected topics related to environmental studies and planning. Topics vary from semester to semester. May be repeated for credit with consent of instructor.

#### ENSP 401 U.S. ENVIRONMENTAL POLICY (4)

This course provides a basic introduction to both American institutions and major environmental policy issues. Examines choices shaping the structure of governance and tools of environmental policy, and asks questions about decision-making, responsibility, and accountability. Open to juniors, seniors, and graduate students only or consent of instructor.

#### ENSP 403 COMPUTER MODELING (3)

A practical course in simulating complex systems using digital computers and dynamic programming. The simulation language STELLA is taught. The principles examined in the course can be applied to any simulation language. Applications in biological conservation, land use planning, hazardous materials management, energy, water quality, and environmental impact reporting are emphasized. Prerequisites: junior standing and GE category B4 (Mathematical Concepts).

#### ENSP 404 ENVIRONMENTAL LAW (3)

Review of environmental law and regulation in the United States generally, and California in particular. Overview of federal and California legal systems with emphasis on their role in environmental protection. Evolution of environmental law in the United States, including property rights and environmental justice.

#### ENSP 405 QUALITATIVE RESEARCH METHODS (2-3)

Whether you are conducting research for a class assignment, writing a paper in graduate school, or solving real environmental problems as a working practitioner, you will need some strong basics in research methods. This class covers a variety of methods in the social sciences applicable to work in a wide range of environmental fields, including library searches, interviews, historical research, finding and interpreting planning documents, and effective writing.

#### ENSP 411A PLANNING WORKSHOP (4)

The first semester of an intensive, year-long project that provides practical experience in preparation of a general (comprehensive) plan for an actual community or geographic area. The fall semester focuses on background studies and field surveys of land use, public opinion, transportation, economic base, and environmental conditions. Class fee required at time of registration. Prerequisites: ENSP 310 and 311, senior standing and/or consent of instructor. Course fee.

#### ENSP 411B PLANNING WORKSHOP (4)

Continuation of ENSP 411A. Spring semester focuses on preparation of the plan, including implementation programs, and following state guidelines. Public presentations of class project. Class fee required at time of registration. Prerequisites: ENSP 411A and consent of instructor. Course fee.

#### ENSP 414 URBAN DESIGN II: PLACEMAKING (3)

Course focus is on the process of designing urban places where public life and a sense of community can thrive. Many critics of American cities have lamented the fact that these urban areas have lost their uniqueness; the urban landscape has come to be visually characterized by a dispiriting "sameness". Considered most offensive are standardized development of chain and big box stores with their corporate logo signs, and cookie cutter residential subdivisions. The course explores efforts of communities to retain their uniqueness and enhance civic pride, including the creation of vibrant public spaces, lively pedestrian environments, and comfortable, safe streets and neighborhoods. The meaning, purposes, and techniques of "contextual design" are explored, especially those designed to protect local historical heritage and regional distinctiveness. Prerequisites: ENSP 310 recommended.

#### ENSP 415 LAND USE LAW (4)

Overview of the law governing land use in California. Fundamentals of the legal system and legal analysis. Substantive law regarding planning and zoning, subdivision, development conditions, growth management, land use initiatives, vested rights, and design review. Constitutional protection of property rights. Prerequisite: ENSP 310 recommended.

#### ENSP 416 ENVIRONMENTAL PLANNING (3)

Review of land use planning and regulation as it relates to the protection of various natural resources and environmental systems. Course subject matter varies and may include wetlands, open space, biodiversity, endangered species, coastal resources, agricultural land, forests, land subject to flooding, multi-species habitat planning, and air quality. Regulatory tools used to ensure resource and environmental protection. Prerequisite: ENSP 310 and/or ENSP 401 recommended.

#### ENSP 418 PLANNING FOR SUSTAINABLE COMMUNITIES (3)

Sustainability as a concept in environmental and land use planning. Definitions and models of sustainability. Evaluation of sustainable development on global, national, regional, and local levels. Practical experience with city and county planning for sustainability. Prerequisite: ENSP 310 recommended.

#### ENSP 419 TRANSPORTATION PLANNING (3)

Theory, methods, and tools related to the systematic analysis of city, regional, and rural transportation problems. The focus is on fundamental land use and transportation interrelationships. Transportation as an integrated system composed of automobiles, public transit, bicycles, and pedestrian travel modes. "Level of service" and traffic impact assessment. Congestion management, energy conservation, sustainability, and environmental impact considerations. Prerequisite: ENSP 310 recommended.

#### ENSP 421 LANDSCAPES OF THE AMERICAN WEST (3)

Use of and interactions with natural resources have transformed the American West over time and greatly affected the western environment as we know it today. This seminar takes a historical look at the settlement, development, and management of the western landscape, both in terms of natural resources (timber, water, grazing, parks etc.) but also in terms of cultural settlement and use - and considers landscape as a tool for understanding the cultural/social/political history of a place. Students can expect to do some serious reading, writing, and thinking about how and why the West has become such a distinctive natural and cultural landscape. Open to juniors, seniors, and graduate students only or consent of instructor.

#### ENSP 422 SPECIAL TOPICS IN CONSERVATION AND RESTORATION (2-3)

Interdisciplinary seminar addressing ecological, historical, cultural, social, and/or policy aspects of different natural resource topics each year. Examples of topics could include forestry, wetlands ecology, fisheries, management, endangered species protection, etc. Students will read and discuss material from diverse sources to achieve a thorough understanding of a particular issue in conservation and restoration, allowing them to participate constructively in on-going policy and management debates. Open to juniors, seniors, and graduate students only or consent of instructor.

#### ENSP 423 ENVIRONMENTAL RESTORATION (3-4)

Field course introducing major concepts and practical aspects of environmental restoration. Topics include the conservation context of restoration, restoration goals, measuring success, experimental approaches, dynamic systems and change over time, disturbance, restoring animal populations and the role of animals in ecosystem restoration, and educational elements of restoration. Practical techniques covered include seed collection, ex-situ seed and plant management and propagation, invasive species removal, planting native species, and others. Topics are addressed in a variety of diverse local systems. Prerequisites: ENSP 302 or BIOL 122, or consent of instructor. Course fee.

#### ENSP 424 FIRE ECOLOGY, MANAGEMENT AND POLICY (3)

A seminar course exploring fire ecology, management, and policy issues. Specific topics covered will include the use of fire or fire surrogates for restoring grassland, shrub land, and forest systems; management of non-native species with prescribed fire; wildfire management, historical fire policy and its ecological implications for the western United States; climate change and fire. Prerequisite: ENSP 200. Course fee.

#### ENSP 425 RESTORATION SEMINAR (3)

This seminar focuses on the ideas and theories behind environmental restoration work and asks some critical questions about current challenges in the field: Where did the idea of restoration come from? What are the goals of environmental restorations, and how do you know if a project is meeting those goals? What do we really mean by the terms "wilderness," "native," "diversity," and so forth? Do environmental mitigation projects really work? We will also look at several real-work cases of restoration projects through the semester. Open to juniors, seniors, and graduate students only or consent of instructor.

#### ENSP 427 CONSERVATION DESIGN (3)

This course applies concepts from landscape ecology and conservation biology to landscape planning and design in a rapidly urbanizing area. Focusing on an area of Sonoma County with both high conservation value and development pressure, the class will develop strategies for development and biodiversity conservation and evaluate those strategies as alternative scenarios in a GIS environment. Prerequisite: ENSP 322, consent of instructor, ENSP seniors only.

**ENSP 428 CONSERVATION RESEARCH METHODS (3)**

This research seminar emphasizes a current topic of applied and theoretical interest in the field of conservation biology. Students investigate the topic through a field research project, along with readings and discussions. Students contribute to all phases of the research, from generating hypotheses and collecting data in the field, to analyzing the data, and to writing a scientific paper based on the results. Each class focuses on a different topic and related set of field methods. Prerequisite: consent of instructor.

**ENSP 430 ENERGY FORUM (1-2)**

Speakers, including community professionals, program alumni, and university faculty, cover a wide variety of energy issues with formal presentations followed by discussion period. May be repeated for credit.

**ENSP 437 PASSIVE SOLAR DESIGN (3-4)**

Fundamentals and advanced applications of passive solar design, including site analysis and design; passive applications (sunspace, trombe wall, convective loop, direct, and indirect gain systems); passive performance predictions; and economic payback analysis. Computer applications and student design projects. Prerequisite: ENSP 337.

**ENSP 438 SMALL SCALE ENERGY SOURCES (3-4)**

Course will focus on functional design of small-scale wind, photovoltaic, biomass, and hydroelectric energy sources. Siting, evaluating potentially available power, design of fully operable installation, and by-products and waste streams will be discussed. Energy storage mechanisms, interconnections to existing energy networks, and energy cost comparisons will be examined. Prerequisite: ENSP 338.

**ENSP 439L COMPUTER APPLICATIONS IN ENERGY MANAGEMENT LABORATORY (1-2)**

Applications laboratory addressing state-of-the-art computer programs in this field. Focus on simulation-and-design programs utilized in residential and commercial building compliance. Student projects and presentations. Prerequisite: ENSP 337 or consent of instructor.

**ENSP 440 EDUCATION AND THE ENVIRONMENT (4)**

This course is designed to provide an introduction to the history and current scope of environmental education; contemporary frameworks for learning and teaching; self, site, and audience assessment; and program options for schools and education centers. One overnight field trip, course fee required at time of registration.

**ENSP 442 METHODS AND MODELS IN EDUCATION AND THE ENVIRONMENT (3)**

An advanced course in environment-based education to build upon the fundamental theory and techniques presented in ENSP 440. The focus is on exemplary programs, place-based delivery techniques, curriculum, and technologies. Several field trips to local schools and community education centers. Cr/NC only. Prerequisite: ENSP 440 or consent of instructor.

**ENSP 444 OUTDOOR LEADERSHIP (3)**

A survey course addressing the theory and practice of outdoor leadership. Central topics include safety and first aid; trip planning, leading, and debriefing; business models and employment options; and outdoor skills such as orienteering, rock climbing, whitewater rafting, and sea kayaking. Course fee and overnight field trips.

**ENSP 448 CLASSROOM GARDEN (1-2)**

Development of curriculum materials and teaching techniques to utilize school and community gardens as outdoor classrooms. Curriculum materials will relate to such topics as plant identification, growth cycles, photosynthesis, soils and nutrients, nutrition, insects, predator/prey relationships, pesticides, and soil and water pollution. Lesson plans suitable for elementary school level will be developed.

**ENSP 450 WATER TECHNOLOGY (4)**

The science and engineering of purifying polluted water for drinking. Applications of mathematics, microbial ecology, and chemistry to the practical problems of working toward California certification in water supply and water treatment. Course has extensive homework and field trips. Prerequisites: GE category B4 (Mathematical Concepts) and one semester of chemistry.

**ENSP 451 WATER REGULATION (3)**

The regulation of water supply and quality from all points of view including regulators, industries, scientific agencies, nonprofit organizations, and action agencies. The law, management, economics, and technology of water. Prerequisite: G.E. category D4 (U.S. Constitution and California State and Local Government).

**ENSP 460 TEACHING ASST IN ENSP (1-4)**

Open only to advanced students. Intended to give students experience in assisting the instructor in an environmental studies course by doing research and tutoring students in the class. Prerequisite: consent of instructor.

**ENSP 470 PLANNING INDEPENDENT STUDY (1-4)**

Contracts for group and individual interdisciplinary study for those qualified to work independently. Internships may be a part of the study. Prerequisite: consent of instructor required prior to registration.

**ENSP 490 SENIOR PROJECT (1-4)**

Group and some individual studies. This major senior activity may be coordinated with independent studies and/or special problems to total 12 units. May be repeated for credit.

**ENSP 495 SPECIAL STUDIES (1-4)**

Independent study designed in consultation with an instructor. Requires prior approval of ENSP faculty member and department chair. Prerequisite: successful completion of at least two ENSP courses and submission of a completed SSU special studies form.

**ENSP 498 SENIOR SEM:ISSUES IN PROF. PRACTICE (1-2)**

Discussion of situations and challenges new planners are likely to encounter early in their professional careers. Seminars include discussions with professional planners on such topics as working with the public, elected officials, and other professionals; maintaining relations with the press; ethical dilemmas; and other matters of current concern. Discussion of students' internship experiences. Required for senior students in the planning concentration. Must be taken within two semesters of graduation. Cr/NC only.

**ENSP 499 INTERNSHIPS (1-8)**

For senior students (in most cases) working off-campus in experiential learning positions with written contract and faculty guidance. Cr/NC or a grade, depending on study plan. Prerequisites: majors only, senior standing, consent of instructor.