ENVIRONMENTAL SCIENCE & POLICY (ESP)

College of Agricultural & Environmental Sciences

ESP 001 — Environmental Analysis (4 units)

Course Description: 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.
Prerequisite(s): UWP 001 (can be concurrent) or UWP 001Y (can be concurrent) or UWP 001V (can be concurrent) or ENL 003 (can be concurrent) or ENL 003V (can be concurrent); or equivalent; sophomore standing; ECN 001A and BIS 002B recommended.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE) or Social Sciences (SS).

ESP 010 — Current Issues in the Environment (3 units)

Course Description: Science behind environmental issues, and policies affecting our ability to solve domestic and international environmental problems. Resources, environmental quality, regulation, environmental perception and conservation. Integrative case studies.
Prerequisite(s): Elementary biology recommended.
Learning Activities: Lecture 3 hour(s).
Credit Limitation(s): Not open for credit to students who have completed ESP 001.
Grade Mode: Letter.
General Education: Science & Engineering (SE) or Social Sciences (SS); Scientific Literacy (SL); Writing Experience (WE).

ESP 092 — Internship (1-12 units)

Course Description: Work experience off and on campus in all subject areas offered in the College of Agricultural & Environmental Sciences. Internship supervised by member of the faculty.
Prerequisite(s): Consent of instructor; lower division standing.
Learning Activities: Variable.
Grade Mode: Pass/No Pass only.

ESP 098 — Directed Group Study (1-5 units)

Course Description: Primarily for lower division students.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable.
Grade Mode: Pass/No Pass only.

ESP 100 — General Ecology (4 units)

Course Description: Theoretical & experimental analysis of the distribution, growth & regulation of species populations; predator-prey & competitive interactions; and the organization of natural communities. Application of evolutionary & ecological principles to selected environmental problems.
Prerequisite(s): (BIS 002A, BIS 002B, BIS 002C); (MAT 016A or MAT 017A or MAT 021A); (MAT 016B or MAT 017B or MAT 021B); STA 013 recommended.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE); Scientific Literacy (SL).

ESP 101 — Ecology, Nature, & Society (4 units)

Course Description: 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.
Prerequisite(s): ANT 001 or ANT 002 or ESP 030 or EVE 100 or BIS 101 recommended.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Cross Listing: ANT 101.
Grade Mode: Letter.
General Education: Social Sciences (SS); World Cultures (WC); Writing Experience (WE).

ESP 104 — Community Ecology (4 units)

Course Description: Population growth and density dependence; predation; exploitative, interference and apparent competition; mutualism and facilitation; coexistence mechanisms; niches, spatial and temporal variation etc. Emphasis on quantitative understanding through models, concepts, and empirical evidence.
Prerequisite(s): ESP 100 or EVE 101.
Learning Activities: Lecture 3 hour(s); Discussion 1 hour(s).
Cross Listing: EVE 104.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Writing Experience (WE).

ESP 106 — Environmental Data Science (4 units)

Course Description: Programming with environmental data using R. Understanding data types, loops, branching and functions. Reproducible workflows and version control to import, organize, explore, analyze and visualize environmental data. Data science terminology and approaches. Common data sources used in environmental science and policy.
Prerequisite(s): STA 013 (can be concurrent) or STA 013 (can be concurrent) or STA 032 (can be concurrent) or STA 100 (can be concurrent).
Learning Activities: Lecture 2 hour(s), Laboratory 6 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE).

ESP 110 — Principles of Environmental Science (4 units)

Course Description: 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.
Prerequisite(s): (PHY 001A or PHY 007A); (MAT 016B or MAT 017B or MAT 021B); BIS 002A or BIS 010 recommended; upper division standing.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE); Quantitative Literacy (QL); Scientific Literacy (SL).

ESP 111 — Marine Environmental Issues (1 unit)

Course Description: Examination of critical environmental issues occurring in coastal waters including the effects of climate change, overfishing, and other human impacts. Through readings and group discussions, students will develop an integrative understanding of the oceanographic and ecological processes.
Prerequisite(s): Consent of instructor.
Learning Activities: Discussion 1 hour(s).
Repeat Credit: May be repeated 2 time(s) when topic differs.
Cross Listing: EVE 111.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Scientific Literacy (SL).

ESP 116N — Oceanography (3 units)

Course Description: Advanced oceanographic topics: Chemical, physical, geological, and biological processes; research methods and data analysis; marine resources, anthropogenic impacts, and climate change; integrated earth/ocean/atmosphere systems; weekly lab and one weekend field trip.
Prerequisite(s): GEL 001 or GEL 002 or GEL 016 or GEL 016V or GEL 050.
Learning Activities: Lecture 2 hour(s), Laboratory 3 hour(s), Fieldwork.
Cross Listing: GEL 116N.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Scientific Literacy (SL).

ESP 121 — Population Ecology (4 units)

Course Description: Development of exponential and logistic growth models for plant and animal populations, analysis of age structure, analysis of competition and predator-prey systems, and analysis of disease dynamics. Developing mathematical models and using them to make predictions and solve problems.
Prerequisite(s): BIS 002B; (MAT 016B or MAT 017B or MAT 019C or MAT 021B or MAT 021BH).
Learning Activities: Lecture 3 hour(s), Laboratory 2.5 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE); Quantitative Literacy (QL); Scientific Literacy (SL).

ESP 123 — Introduction to Field & Laboratory Methods in Ecology (4 units)

Course Description: Introduction to methods used for collecting ecological data in field and laboratory situations. Methods used by population ecologists and community ecologists; emphasis on experimental design, scientific writing and data analysis.
Prerequisite(s): (ESP 100 or EVE 101); (STA 013 or STA 013Y or STA 100); or equivalent.
Learning Activities: Lecture 2 hour(s), Laboratory 2 hour(s), Fieldwork 4 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE); Scientific Literacy (SL).

ESP 124 — Marine & Coastal Field Ecology (3 units)

Course Description: Ecology of marine populations and communities living in diverse habitats along the California coast. Hands-on learning using scientific process and tools of the biological trade to address ecological questions arising during field trips. Critical thinking through discussing scientific literature.
Prerequisite(s): Upper division standing or consent of instructor; introductory animal biology (BIS 001B) recommended; residence at or near Bodega Marine Lab required.
Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s), Laboratory 3 hour(s), Fieldwork 3 hour(s).
Enrollment Restriction(s): Enrollment restricted to application at http://www.bml.ucdavis.edu.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Scientific Literacy (SL).

ESP 127 — Plant Conservation Biology (4 units)

Course Description: 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.
Prerequisite(s): ESP 100 or EVE 101; or equivalent upper division general ecology.
Learning Activities: Lecture/Discussion 3 hour(s), Discussion 1 hour(s), Term Paper.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Scientific Literacy (SL).

ESP 150A — Physical & Chemical Oceanography (4 units)

Course Description: Physical and chemical properties of seawater, fluid dynamics, air-sea interaction, currents, waves, tides, mixing, major oceanic geochemical cycles.
Prerequisite(s): (ESP 116N or GEL 116N); (PHY 007B or PHY 009B); (MAT 016C or MAT 017C or MAT 019C or MAT 021C); (CHE 002C or GEL 055); and consent of instructor.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Cross Listing: GEL 150A.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Quantitative Literacy (QL).

ESP 150B — Geological Oceanography (3 units)

Course Description: Introduction to the origin and geologic evolution of ocean basins. Composition and structure of oceanic crust; marine volcanism; and deposition of marine sediments. Interpretation of geologic history of the ocean floor in terms of sea-floor spreading theory.
Prerequisite(s): GEL 050 or (GEL 116N or ESP 116N).
Learning Activities: Lecture 3 hour(s).
Cross Listing: GEL 150B.
Grade Mode: Letter.
General Education: Science & Engineering (SE).

ESP 150C — Biological Oceanography (4 units)

Course Description: Ecology of major marine habitats, including intertidal, shelf benthic, deep-sea and plankton communities. Existing knowledge and contemporary issues in research. Segment devoted to human use. One weekend field trip required.
Prerequisite(s): BIS 002A; consent of instructor; a course in general ecology.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s), Fieldwork.
Cross Listing: GEL 150C.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Scientific Literacy (SL).

ESP 151 — Limnology (4 units)

Course Description: Biology and productivity of inland waters with emphasis on the physical and chemical environment.
Prerequisite(s): BIS 002A; BIS 002B; (BIS 002C and ESP 100 or EVE 101 recommended.)
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE).

ESP 151L — Limnology Laboratory (3 units)

Course Description: Limnological studies of lakes, streams, and reservoirs with interpretation of aquatic ecology.
Prerequisite(s): ESP 151 (can be concurrent); junior, senior, or graduate standing.
Learning Activities: Laboratory 6 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE).

ESP 152 — Coastal Oceanography (3 units)

Course Description: Oceanography of coastal waters, including bays, river plumes, nearshore and estuaries; focus on transport patterns, how they are forced and implications for ecological and environmental problems. Pertinent for students in oceanography, ecology, environmental engineering, geology and hydrology.
Prerequisite(s): Upper division standing or consent of the instructor; physics (PHY 009B), calculus (MAT 021B) and exposure to physical and chemical oceanography (GEL 150A and ESP 150A) are recommended; residence at or near Bodega Marine Laboratory required.
Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s), Laboratory 3 hour(s), Fieldwork 3 hour(s).
Enrollment Restriction(s): Enrollment restricted to application at http://www.bml.ucdavis.edu.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Scientific Literacy (SL).

ESP 155 — Wetland Ecology (4 units)

Course Description: Introduction to wetland ecology. The structure and function of major wetland types and principles that are common to wetlands and that distinguish them from terrestrial and aquatic ecosystems.
Prerequisite(s): BIS 002A; or equivalent of BIS 002A; ESP 100 or EVE 101 recommended.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE).

ESP 155L — Wetland Ecology Laboratory (3 units)

Course Description: Modern and classic techniques in wetland field ecology. Emphasis on sampling procedures, vegetation analysis, laboratory analytical procedures, and examples of successful wetland restoration techniques.
Prerequisite(s): ESP 155 (can be concurrent).
Learning Activities: Lecture 1 hour(s), Laboratory 6 hour(s), Fieldwork.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Scientific Literacy (SL).

ESP 160 — The Policy Process (4 units)

Course Description: Alternative models of public policymaking and application to case studies in the U.S. and California.
Prerequisite(s): POL 001 or POL 001Y; ECN 001A and STA 013 recommended.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Social Sciences (SS).

ESP 161 — Environmental Law (4 units)

Course Description: 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.
Prerequisite(s): Upper division standing; one course in environmental science or political science recommended.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Social Sciences (SS); Writing Experience (WE).

ESP 162 — Environmental Policy (4 units)

Course Description: 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.
Prerequisite(s): ECN 001A or ECN 001AY or ECN 001AV.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Social Sciences (SS).

ESP 163 — Energy & Environmental Aspects of Transportation (4 units)

Course Description: Engineering, economic, and systems planning concepts. Analysis and evaluation of energy, air quality and selected environmental attributes of transportation technologies. Strategies for reducing pollution and petroleum consumption in light of institutional and political constraints. Evaluation of vehicle emission models.
Prerequisite(s): Upper division standing in engineering or economics or environmental studies.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Cross Listing: ECI 163.
Grade Mode: Letter.
General Education: Science & Engineering (SE) or Social Sciences (SS).

ESP 165 — Climate Policy (3 units)

Course Description: Models, data and assumptions behind competing arguments regarding societal response to the prospect of climate change at the state, national and international level from economic, ethical and policy science perspectives.
Prerequisite(s): ESP 001 or ECN 001A or ESP 001AY or ECN 001AV; or consent of instructor.
Learning Activities: Lecture 3 hour(s).
Grade Mode: Letter.
General Education: Writing Experience (WE).

ESP 166 — Ocean & Coastal Policy (3 units)

Course Description: Overview of U.S. and International ocean and coastal policy, including energy, coastal land-use and water quality, protected areas and species.
Prerequisite(s): ESP 001; or consent of instructor.
Learning Activities: Lecture 3 hour(s).
Enrollment Restriction(s): Limited enrollment.
Grade Mode: Letter.
General Education: Social Sciences (SS).

ESP 167 — Energy Policy (4 units)

Course Description: 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.
Prerequisite(s): (ECN 001A or ECN 001AY or ECN 001AV); (MAT 016B or MAT 017B or MAT 021B); or consent of instructor.
Learning Activities: Lecture 4 hour(s), Term Paper.
Grade Mode: Letter.
General Education: Social Sciences (SS).

ESP 168A — Methods of Environmental Policy Analysis (5 units)

Course Description: Evaluation of alternatives for solution of complex environmental problems; impact analysis, benefit cost analysis, distributional analysis, decision making under uncertainty, and multi-objective evaluation.
Prerequisite(s): (ESP 001 or ESP 010); (STA 013 or STA 013Y or STA 100); (ECN 001A or ECN 001AY or ECN 001AV); ECN 100 recommended.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s), Term Paper.
Grade Mode: Letter.
General Education: Social Sciences (SS).

ESP 168B — Methods of Environmental Policy Evaluation (4 units)

Course Description: Continuation of ESP 168A. Emphasis on examination of the literature for applications of research & evaluation techniques to problems of transportation, air & water pollution, land use, and energy policy.
Prerequisite(s): ESP 168A.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Social Sciences (SS).

ESP 169 — Water Policy & Politics (3 units)

Course Description: Governance of water, including issues of water pollution/quality and water supply. 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.
Prerequisite(s): ECN 001A or POL 001 recommended.
Learning Activities: Lecture 3 hour(s).
Grade Mode: Letter.
General Education: Social Sciences (SS).

ESP 170 — Conservation Biology Policy (4 units)

Course Description: 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.
Prerequisite(s): One course in environmental science (e.g., ESP 001), conservation (e.g., WFC 011 or WFC 154), or government (e.g., POL 001) recommended.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE) or Social Sciences (SS).

ESP 171 — Urban & Regional Planning (4 units)

Course Description: 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.
Prerequisite(s): ESP 001 or ESP 161 or ESP 179 recommended.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s), Term Paper.
Grade Mode: Letter.
General Education: Social Sciences (SS); Writing Experience (WE).

ESP 172 — Public Lands Management (4 units)

Course Description: Investigation of alternative approaches to public lands management by Federal and state agencies. Role each agency's legislation plays in determining the range of resource allocations.
Prerequisite(s): POL 001 and ECN 001A recommended.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Social Sciences (SS); American Cultures, Governance, & History (ACGH).

ESP 173 — Land Use & Growth Controls (4 units)

Course Description: Exposes students to the economic, political, and legal factors affecting land use and growth controls, and helps students critically evaluate written materials in terms of their arguments and supporting data. May be taught abroad.
Prerequisite(s): Upper division standing; one course in environmental policy.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Social Sciences (SS).

ESP 174 — Environmental Justice Policy & Practice (4 units)

Course Description: History and frameworks of environmental justice; environmental justice policy; methods of spatial analysis. Emphasis on California and the United States.
Prerequisite(s): ESP 001 or equivalent recommended.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Social Sciences (SS); Domestic Diversity (DD); Writing Experience (WE).

ESP 175 — Natural Resource Economics (4 units)

Course Description: 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).
Prerequisite(s): ARE 100A C- or better or ECN 100A C- or better or ECN 100 C- or better.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Enrollment Restriction(s): Pass One open to Managerial Economics (AMGE), Environmental Policy Analysis & Planning (AEPP) Majors, Agricultural & Resource Economics (GARE) Graduate Majors.
Cross Listing: ARE 175.
Grade Mode: Letter.
General Education: Social Sciences (SS).

ESP 178 — Applied Research Methods (4 units)

Course Description: Research methods for analysis of urban and regional land use, transportation, and environmental problems. Survey research and other data collection techniques; demographic analysis; basic forecasting, air quality, and transportation models. Collection, interpretation, and critical evaluation of data.
Prerequisite(s): STA 103 or STA 100 or STA 108 or SOC 106 or ARE 106; or the equivalent.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Social Sciences (SS); Quantitative Literacy (QL).

ESP 179 — Environmental Impact Assessment (4 units)

Course Description: 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.
Prerequisite(s): ESP 001; or the equivalent.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Social Sciences (SS).

ESP 179L — Environmental Impact Reporting Using Geographic Information (2 units)

Course Description: Introduction to Geographic Information Systems (GIS) by using ArcView for assessment and environmental planning.
Prerequisite(s): ESP 179 (can be concurrent); ESP 179 required concurrently.
Learning Activities: Discussion/Laboratory 2 hour(s), Laboratory 4 hour(s).
Credit Limitation(s): Not open for credit to students who have completed ABT 180, ABT 181, or ASE 132.
Grade Mode: Letter.
General Education: Science & Engineering (SE).

ESP 190 — Workshops on Environmental Problems (1-8 units)

Course Description: Workshops featuring empirical analyses of contemporary environmental problems by multidisciplinary student teams. Guided by faculty and lay professionals, the teams seek to develop an integrated view of a problem and outline a series of alternative solutions.
Prerequisite(s): Consent of instructor.
Learning Activities: Laboratory 2-16 hour(s).
Enrollment Restriction(s): Open to all upper division and graduate students on application.
Repeat Credit: May be repeated.
Grade Mode: Pass/No Pass only.
General Education: Science & Engineering (SE).

ESP 191A — Workshop on Food System Sustainability (3 units)

Course Description: 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.
Prerequisite(s): PLS 015; CRD 020; ARE 121; PLS 150; or consent of instructor; upper division standing.
Learning Activities: Lecture 2 hour(s), Laboratory 3 hour(s).
Enrollment Restriction(s): Priority enrollment for seniors in the sustainable agriculture and food systems major; limited to 25 students per section.
Grade Mode: Letter.
General Education: Science & Engineering (SE).

ESP 191B — Workshop on Food System Sustainability (3 units)

Course Description: Continuation of ESP 191A. 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.
Prerequisite(s): ESP 191A.
Learning Activities: Lecture 2 hour(s), Laboratory 3 hour(s).
Enrollment Restriction(s): Priority enrollment for seniors in the sustainable agriculture and food systems major; limited to 25 students per section.
Grade Mode: Letter.
General Education: Science & Engineering (SE).

ESP 192 — Internship (1-12 units)

Course Description: Work experience off and on campus in all subject areas offered in the College of Agricultural and Environmental Sciences. Internships supervised by a member of the faculty.
Prerequisite(s): Consent of instructor; completion of 84 units.
Learning Activities: Internship 3-36 hour(s).
Grade Mode: Pass/No Pass only.

ESP 197T — Tutoring in Environmental Science & Policy (1-5 units)

Course Description: Experience in teaching under guidance of faculty member.
Prerequisite(s): Consent of instructor; upper division standing.
Learning Activities: Tutorial 2-6 hour(s).
Grade Mode: Pass/No Pass only.

ESP 198 — Directed Group Study (1-5 units)

Course Description: Directed group study.
Learning Activities: Variable.
Grade Mode: Pass/No Pass only.

ESP 199 — Special Study for Advanced Undergraduates (1-5 units)

Course Description: Special study for advanced undergraduates.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable.
Grade Mode: Pass/No Pass only.

ESP 212A — Environmental Policy Process (4 units)

Course Description: Introduction to selected theories of the policy process and applications to the field of environmental policy. Develops critical reading skills, understanding of policy theory, and an ability to apply multiple theories to the same phenomena.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Enrollment Restriction(s): Restricted to graduate standing.
Cross Listing: ECL 212A.
Grade Mode: Letter.

ESP 212B — Environmental Policy Evaluation (4 units)

Course Description: Method and practice, philosophical basis, and political role of policy analysis. Reviews basic concepts from economic theory; how and why environmental problems emerge in a market economy; and tools necessary for solving environmental problems.
Learning Activities: Lecture 4 hour(s).
Enrollment Restriction(s): Restricted to Graduate Standing.
Cross Listing: ECL 212B, ENV 200B.
Grade Mode: Letter.

ESP 220 — Tropical Ecology (3 units)

Course Description: Overview of present status of knowledge on structure and processes of major tropical ecosystems. Differences and similarities among tropical and temperate systems stressed.
Prerequisite(s): ESP 100; EVE 101; EVE 117; EVE 138 recommended.
Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s).
Enrollment Restriction(s): Open to graduate and undergraduate students who meet requirement subject to consent of instructor.
Grade Mode: Letter.

ESP 228 — Advanced Simulation Modeling (3 units)

Course Description: Advanced techniques in simulation modeling; optimization and simulation, dynamic parameter estimation, linear models, error propagation, and sensitivity testing. Latter half of course introduces model evaluation in ecological and social system models.
Prerequisite(s): (STA 108 or ARE 106); (ESP 128 and ESP 128L).
Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.

ESP 275 — Economic Analysis of Resource & Environmental Policies (4 units)

Course Description: 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.
Prerequisite(s): ARE 204 or ECN 204.
Learning Activities: Lecture/Discussion 4 hour(s).
Cross Listing: ARE 275.
Grade Mode: Letter.

ESP 278 — Research Methods in Environmental Policy (3 units)

Course Description: Introduction to scientific research in environmental policy.Major issues in the philosophy of the social sciences.How to design research that acknowledges theoretical assumptions and that is likely to produce evidence in an intersubjectively reliable fashion with explicit recognition of its uncertainties.
Prerequisite(s): ARE 106; or the equivalent.
Learning Activities: Lecture/Discussion 3 hour(s).
Grade Mode: Letter.

ESP 298 — Directed Group Study (1-5 units)

Course Description: Directed group study.
Learning Activities: Variable.
Grade Mode: Letter.

ESP 299 — Research (1-12 units)

Course Description: Research.
Prerequisite(s): Consent of instructor; graduate standing.
Learning Activities: Variable.
Grade Mode: Satisfactory/Unsatisfactory only.

ESP 396 — Teaching Assistant Training Practicum (1-4 units)

Course Description: Teaching assistant training practicum.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable 3-12 hour(s).
Enrollment Restriction(s): Open to graduate students only.
Repeat Credit: May be repeated.
Grade Mode: Satisfactory/Unsatisfactory only.