

Environmental Science & Management

LOWER DIVISION

ESM 105. Natural Resource Conservation (3). Broad aspects; history of humanity in relation to land use; human populations in relation to resources; history of conservation movement; present day conservation problems. [D-LD.]

ESM 108. Environmental Science and Climate Change (3). Examination of critical thinking and the scientific method; how these intellectual tools have been used to develop an understanding of the global environment; special attention on climate change. [B-LD.]

ESM 111. Environmental Science Seminar (1). Introduction to the scope of the environmental sciences, current issues, guest speakers, career opportunities. [Rep 4 times. CR/NC.]

ESM 210. Public Land Use Policies & Management (3). Overview of public lands: Historical view of major statutes, agency evolution, and resource management policies. [Rec: ESM 105.]

ESM 215. Natural Resources & Recreation (3). Three primary components: resources, visitors, and management. Motivations and benefits, overview of providers, and fundamental recreation concepts.

ESM 230. Environmental Methods (3). Introduction to quantitative tools for environmental problem solving. Basic modeling skills in the context of topics related to environmental issues associated with air, water, land/earth, and energy. [Prereq: ESM 105 or GEOG 106; STAT 108 or STAT 108i or STAT 109; sophomore standing or greater. Weekly: 2 hrs lect, 3 hrs lab.]

ESM 253. Interpretive Computer Graphics (3). Fundamental course in computer graphic design and layout for producing natural resource interpretive displays, flyers, posters, book covers, brochures, newsletters, and multimedia slide presentations. Background in basic computer skills required. [Weekly: two 3-hr labs.]

UPPER DIVISION

ESM 301 / GEOG 301. International Environmental Issues & Globalization (3). Cross-disciplinary examination of economic development, world regions, population trends, resource exploitation, sustainability, impact of resource extraction in key world locations, and increasing global environmental connectivity, integration, and interdependence. [D-UD.]

ESM 302. Biodiversity on Earth (3). State of biodiversity around the world and forces that affect it. Origins of this diversity, advantages of variability in the environment for human life, and contemporary challenges to diversity. [B-UD.]

ESM 303. Applied Natural History & Ecology (4). Biotic communities of the north coast of California and the identification, ecology and life history of the organisms living there. Includes basic principles of ecology, field techniques for studying organisms in the wild, and methods of

collecting and recording field data. [Prereq: ESM 105, STAT 108 or STAT 108i or STAT 109; BIOL 105 or BOT 105; ESM 230 (C); environmental science & management majors; junior standing or greater. B-UD.]

ESM 305. Environmental Conflict Resolution (3). Introduction to conflict theory as applied in complex natural resource disputes. Skill development in planning culturally appropriate and inclusive public participation processes, meeting facilitation, and conflict mediation. Comparison of options for nonviolent conflict management. [Prereq: sophomore standing or greater. Weekly: 2 hrs lect, 2 hrs activ. D-UD.]

ESM 308. Ecotopia (3). Interdisciplinary study of redwood ecosystem biophysical and cultural characteristics. Guest presentations, disc/activ sessions. [Prereq: lower division GE area B completed. B-UD.]

ESM 309B. Environmental Communication (3). This course is intended for advanced students who want to learn the basic theories, strategies, and techniques used to communicate a body of scientific knowledge to the public in a comprehensible manner. [Prereq: sophomore standing or greater. C-UD; D-UD.]

ESM 325. Environmental Law & Regulation (3). Overview of laws, policy, and institutions used to regulate natural resource management and protect the environment. Legal principles; property rights; federal, state, and international environmental legislation; and regulatory authorities. [Prereq: ESM 105. Weekly: 3 hrs lect.]

ESM 350. Fundamentals of Environmental Education & Interpretation (3). Theories, processes, goals of environmental education and interpretation, evolution of disciplines, curriculum standards. Program development techniques for environmental and cultural heritage themes. Skill development in program presentation and evaluation. [Weekly: 2 hrs lect, 3 hrs lab.]

ESM 351. Environmental Interpretation Field Trip (1). Visit sites illustrating issues and techniques of natural resources interpretation. [CR/NC. Three-day field trip.]

ESM 353. Environmental Education & Interpretation Graphics (3). Theory and skills of written and graphic interpretation techniques. Application to signs, brochures, self-guided trails, exhibits. [Prereq: ESM 253 and ESM 350. Weekly: 2 hrs lect, 3 hrs lab.]

ESM 355. Principles of Ecological Restoration (3). Scientific basis for reconstruction of degraded ecosystems. Focus on practices designed to improve ecological structure and function, and meeting societal needs for sustainable and functional ecosystems. [Prereq: BOT 105; SOIL 260; ESM majors; junior standing or greater.]

ESM 360. Introduction to Environmental Planning Methods (3). Interdisciplinary planning methods. Application of ecological, economic, and social information and analysis for environmental planning from wildlands to working landscapes, rural and urban communities, at site and landscape scales. [Must have sophomore standing or

greater. Rec: ESM 105 and ESM 210. Weekly: 2 hrs lect, 3 hrs lab.]

ESM 365. Local Government Planning (3). History of resource and land-use planning, planning theory, planning processes, and land development in the US. Overview of current land-use planning issues, processes, and techniques with emphasis at the local and regional levels. [Prereq: ESM 360. Weekly: 3 hrs lect.]

ESM 370. Energy, Technology & Society (3). Interdisciplinary course in energy, the environment, and society. Focuses on energy and climate change, integrating physical science, social science, and policy dimensions. [Prereq: CHEM 107 or CHEM 109; ESM 230; junior standing or greater.]

ESM 375. Energy, Technology & Society II (3). Methods, tools and perspectives to understand and influence society's technical, economic, and policy choices concerning energy generation and use. Electric power systems, generation technologies, grid operation, electricity markets, and efficiency. [Prereq: ESM 370.]

ESM 400. Inscape & Landscape (3). An evaluation of individual perception (inscape) of nature (landscape) relative to our unique individual histories. An overview of human population growth, resource consumption, and resource availability will lead to a personal evaluation of the relationship of inscape to landscape. [Prereq: junior standing or greater. Weekly: 2 hrs lect, 2 hrs activ. E-UD.]


ESM 410. Environmental Science Practicum (3). Work locally to develop creative solutions to environmental problems. Critique opportunities and obstacles to innovative decision making. [Prereq: ESM 230, GSP 216, GSP 316 and GSP 370; senior standing.]

ESM 411. Sustainable Campus (3). Environmental science & management majors capstone: Systematic problem solving framework applied to making the campus sustainable. [Prereq: ESM 370; ENGR 371; senior or graduate standing; IA for non-majors.]

ESM 415. Recreation & Park Planning (3). The planning process as applied to natural resource recreation areas; master planning for parks and other wildland recreation areas; NEPA; public involvement; planning facilities such as trails and campgrounds. [Prereq: ESM 215. Weekly: 2 hrs lect, one 3-hr lab.]

ESM 420. Ecosystem Analysis (3). Inventory and analysis methods for ecosystems based on systems ecology, sustainability science, and resilience theory. Focus on human impacts and management efforts in local landscapes. [Prereq: ESM 303 or IA. Weekly: 2 hrs lect, 3 hrs lab.]


ESM 425. Environmental Impact Assessment (3). Legislative/judicial history and current implementation of National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). Practice analyzing and preparing impact assessments for development projects. [Rec: ESM 325. Weekly: 2 hrs lect, one 3-hr lab.]


 **ESM 430. Natural Resource Management in Protected Areas** (3). Principles/practices managing natural resources in wildland recreation areas. Fire, air, water quality; erosion; endangered species; exotic species control; hazardous features. Case studies. [Prereq: STAT 108 or STAT 108i or STAT 109; ESM 303; upper division standing. Weekly: 2 hrs lect, 3 hrs lab.]


ESM 435. Grant Proposal Writing (2). Fundamentals of grant proposal writing, from conception of the idea to writing a coherent and persuasive proposal. Combines critical thinking, communication and quantitative reasoning skills, and critical evaluation of proposals. [Weekly: 2 one-hr lect.]


ESM 440. Managing Recreation Visitors (2). Theoretical foundations and practical applications of managing recreation settings and people who visit them. [Prereq: ESM 215.]

ESM 440L. Managing Recreation Visitors Lab (1). Field trips to state and national parks and forests. [Prereq: ESM 215.]


 **ESM 450. Applied Environmental Education & Interpretation** (3). Theories, teaching methods, current research, controversial issues. Design of environmental education and interpretation programs for children and adults. Advanced skills in program evaluation. Professional development in environmental education and interpretation. [Prereq: ESM 350 or IA. Weekly: 2 hrs lect, 3 hrs lab.]

 **ESM 453. Environmental Education & Interpretation Practicum** (4). Capstone course for interpretation majors with a focus on graphic skills in interpretive programming and design. Projects include exhibits, brochures, and overall interpretive programming. [Prereq: ESM 350, ESM 353, ESM 450; or their equivalents.]


 **ESM 455. Applied Ecological Restoration** (4). Restoration process, including identifying causes of degradation, devising methods and goals for restoration, developing management strategies for restored sites, monitoring changes and assessing success; focus on aquatic systems. [Prereq: ESM 303; ESM 355; ESM majors; senior standing or greater. Weekly: 2 hrs lect, 1 hr disc, 3 hrs lab.]


 **ESM 460. Environmental Planning for Public Lands & Rural Communities** (3). Environmental planning processes applied by state and federal agencies and rural communities to manage for desired ecological, economic, and social outcomes on public lands and across rural landscapes. Key themes: collaborative processes, community involvement, stewardship. [Prereq: ESM 360. Rec: ESM 425. Weekly: 2 hrs lect, 3 hrs lab; 3-day field trip required. Service fee.]

ESM 462. Coastal & Marine Planning (3). Approaches, policies, and politics related to planning and management in coastal and ocean areas. Consider ways to balance coastal and marine ecosystem conservation with a variety of human uses. [Prereq: ESM 360.]

 **ESM 471. Spatial Analysis Lab Projects** (1). Intended for students with experience in GIS and/or Remote Sensing who require the facilities and software tools available in the Spatial Analysis Lab for special projects or research. This course does not count towards graduation units. [Prereq: GSP 216 or GSP 270 or GSP 326 or GSP 330 or GSP 370 or GSP 436 or GSP 470 or GSP 570. AU. Rep 3 times.]

ESM 475. Senior Planning Practicum (4). Capstone course: a planning project in a group format. [Prereq: ESM 365; ESM 425 (C); senior standing. Weekly: 2 hrs lect, 6 hrs lab.]

 **ESM 480. Selected Topics** (.5-3). Planning, ecology, administration, law, ethics, or other topics of current interest. [Rep with different topics. Prereq: IA. Variable format.]

 **ESM 480L. Selected Topics/Lab** (.5-3). Planning, ecology, administration, law, ethics, or other topics of current interest. Lab/field format. Service Fee. [Rep with different topics. May require prereqs.]


ESM 482. Internship (2-3). Students implement the theory and practice of their major by working for a public agency or private firm/organization. Advanced standing and instructor consent. [CR/NC.]

ESM 499. Directed Study (1-3). Individualized research/study project. [Prereq: junior/senior standing. Rep.]

GRADUATE

ESM 510. Human Dimensions of Natural Resources (3). Overview of the role of social issues in natural resource management. Theory and methods related to human dimensions research. Applications of sociocultural research to management. Practice implementing methods. [Prereq: graduate standing or IA.]

ESM 555. Applied Ecological Restoration (4). Project-based course provides graduate students with experience related to the planning, design, implementation, and monitoring of restoration projects, including research techniques. Additional rigor required for graduate students. Prior coursework in ecology, conservation and/or ecological restoration are recommended. [Prereq: graduate standing; IA.]

 **ESM 580. Selected Topics** (1-3). Interpretation, planning, ecology, administration, law, ethics, other topics of interest. [Rep with different topics.]

ESM 597. Mentoring & Teaching-Associate Training (1-4). Train in course preparation and delivery. Advanced majors and grad students take this prior to or concurrent with teaching-assistant or teaching-associate assignments. No credit toward graduate degree.

ESM 620. Ecosystems & Society (3). Exploration of sustainability science based approaches to an integrated understanding of ecosystems and society and implications for ecological and social resilience, adaptation, and transformation. [Prereq: must have graduate standing.]

ESM 685. Graduate Seminar (1-3). Topics of current interest. [Rep.]

ESM 690. Thesis (1-4). [Rep. CR/NC.]

ESM 695. Field Research (1-4). [Rep. CR/NC.]

ESM 699. Directed Study (1-4). [Rep.]