ENSC 2025-2026 COURSE OFFERINGS
(TENTATIVE SCHEDULE)

Course Number	Units	Course Title	Prerequisites and Corequisites (Course Description)	Fall	Winter	Spring	Summer
ENSC 092	1	Freshman Seminar in the Environmental Sciences	Prerequisite(s): restricted to class level standing of freshman; restricted to major(s) Environmental Sciences; or consent of instructor. Introduction to the program of environmental sciences. Includes peer network development, career options and goals in the environmental sciences, opportunities for undergraduate research, development of learning and study skills, ethics in research and education, and an introduction to the faculty in ENSC. Graded Satisfactory (S) or No Credit (NC).	X	X		
ENSC 001	4	Introduction to Environmental Science: Natural Resources	Prerequisite(s): none. An introduction to environmental science, focusing on natural resource description, management, and conservation. Covers ecosystem characteristics and function; material and energy flows; population dynamics and influence of population on the environment; energy resources and conservation; and mineral and soil resources and their management.	X			
ENSC 002	4	Introduction to Environmental Science: Environmental Quality	Prerequisite(s): none. An introduction to environmental science, focusing on the impact of human development and technology on the quality of natural resources and living organisms. Topics include soil, water, and air pollution; water, land, and food resources; wildlife management and species endangerment; toxicology and risk management; and solid and hazardous waste management.		X		
ENSC 003	4	Contemporary Issues in the Environmental Sciences	Prerequisite(s): none. An issue-oriented approach to understanding the scientific principles behind environmental issues. Case studies of environmental issues appearing in the mass media provide the context for assessing the status of scientific knowledge and its role in human decision making.			X	
ENSC 004	4	Climate Change in California	Prerequisite(s): none. Introduction to the science of contemporary climate change including the drivers and impacts of change to date and into the future focusing on inland Southern California. Addresses individuals facing the climate crisis as well as explores possible solutions to the causes and consequences of climate change.			X	
ENSC 100	4	Introduction to Soil Science	Prerequisite(s): CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 01HLC; ENSC 001, may be taken concurrently or ENSC 002, may be taken concurrently or CEE 010; or consent of instructor. Explores the fundamental principles of soil science and soils as a natural resource. Introduces the morphology, physics, chemistry, microbiology, fertility, classification, development, and management of soils in relation to the environment.	X			
ENSC 101	4	Water Resources	Prerequisite(s): CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 01HLC; ENSC 001, may be taken concurrently or ENSC 002, may be taken concurrently; or consent of instructor. An introduction to the hydrologic cycle. Covers water sources, distribution, and conveyance; physical, chemical, and biological properties of water; water treatment and reuse; and regulatory framework.		X		
ENSC 102	4	Introductory Atmospheric Science	Prerequisite(s): CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 01HLC; ENSC 001, may be taken concurrently or ENSC 002, may be taken concurrently; or consent of instructor. Covers the physical structure and chemical composition of the Earth's atmosphere including interactions with terrestrial, biological, and oceanic systems. Also emphasizes human impacts including an introduction of air quality and climate change concepts as well as an overview of air pollution control strategies.			X	
ENSC 105	4	Ecohydrology	Prerequisite(s): ENSC 002. Introduction to the role of water in ecosystems. Explores the movement of water through ecosystems and interactions with biota across a range of climatic and ecological zones. Examines the major human impacts on hydrology and their ecological and environmental implications. Field trips to representative hydrological systems			X	
ENSC 107	4	Soil Physics	Prerequisite(s): MATH 007B or MATH 009B or MATH 09HB; PHYS 002A or PHYS 02HA; ENSC 100; or consent of instructor. Topics include physical properties of soils and methods of evaluation. Emphasizes movement of water, heat, gases, and chemicals through soil.	X			
ENSC 110	4	Environmental Statistics	Prerequisite(s): MATH 007B or MATH 009B or MATH 009HB; STAT 008 or STAT 010; or consent of instructor. Introduces the use of computers to solve mathematical problems arising in environmental sciences. Applies various computational methods (such as linear regression, optimization, Monte Carlo simulation, and data assimilation) to environmental problems using R.		X		
ENSC 120	4	Soil Ecology	Prerequisite(s): BIOL 002 or BIOL 005A, BIOL 05LA; CHEM 001C, CHEM 01LC or CHEM 01HC, CHEM 1HLC; ENSC 100; or consent of instructor. A study of soil biota and their relationships with plants and the soil environment. Emphasizes life strategies of soil organisms and methods to study them. Examines importance of microbial and faunal groups from the rhizosphere to the ecosystem. Explores impact on soil fertility, carbon and nitrogen cycles, and Earth's climate. Crosslisted with NEM 120.		X		
ENSC 127	4	Fate and Transport of Contaminants in the Environment	Prerequisite(s): ENSC 100; MATH 007B or MATH 009B or MATH 09HB; or consent of instructor. Topics include interactions of environmental conditions with abiotic and biotic transformation and transport of major organic and inorganic contaminants in the environment.			X	
ENSC 134	4	Soil Conditions and Plant Growth	Prerequisite(s): BIOL 104/BPSC 104 or ENSC 100; or consent of instructor. A study of the chemical, physical, and biological properties of soils and their influence on plant growth and development. Topics include soil-plant water relations; fundamentals of plant mineral nutrition; soil nutrient pools and cycles; soil acidity, alkalinity, salinity, and sodicity; root symbioses; and rhizosphere processes. Crosslisted with BPSC 134.		X		
ENSC 135	4	Atmospheric Chemistry	Prerequisite(s): CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA, CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB, or consent of instructor; ENSC 102 recommended. Structure of the troposphere and stratosphere; formation of atmospheric ozone; tropospheric NOx chemistry; methane oxidation cycle; phase distributions of chemicals; wet and dry deposition; chemistry of volatile organic compounds; formation of photochemical air pollution; modeling of air pollution and control strategies; stratospheric ozone depletion and global warming. Cross-listed with CHEM 135, and ENTX 135.		X		
ENSC 136	4	Chemistry of Natural Waters	Prerequisite(s): CHEM 005 with a grade of "C-" or better or ENSC 101 with a grade of "C-" or better or consent of instructor. Introduction to processes controlling the chemical composition of natural waters. Topics include chemical equilibria, acid-base and coordination chemistry, oxidation-reduction reactions, precipitation-dissolution, air-water exchange, and use of equilibrium and kinetic models for describing marine nutrient, trace metal, and sediment chemistry. Cross-listed with CHEM 136.	X			
ENSC 138	4	Pedology	Prerequisite(s): ENSC 100; GEO 001; or consent of instructor. Covers the study of soils in natural environments. Examines how soils form and their roles within ecosystems and landscapes. Topics include soil variability, soil classification, and soils as indicators of environmental conditions. Field trips emphasize description and interpretation of soils. Requires two 3-hour Laboratory activities and four 6-hour Field Trips. Cross-listed with GEO 138.			X	

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Lower Division Requirement	Upper Division Requirement	Major Electives	Approved Graduate Level Courses (require instructor approval and petition with advisor)

ENSC 2025-2026 COURSE OFFERINGS

(TENTATIVE SCHEDULE)

Course Number	Units	Course Title	Prerequisites and Corequisites (Course Description)	Fall	Winter	Spring	Summer
ENSC 140	4	Limnology	Prerequisite(s): ENSC 101; or consent of instructor. A study of surface waters. Considers in detail the physical and chemical processes in surface waters, aquatic biology, ecosystem dynamics, and aspects of surface water quality and modelin	X			
ENSC 154	4	Risk Assessment	Prerequisite(s): ENTX 101; STAT 010; or equivalent; or consent of instructor. An introduction to the basic principles and methods by which health risks associated with exposure to chemical and physical agents are determined. Topics include hazard identification, dose response and exposure assessments, and risk characterization and management. Cross-listed with ENTX 154.		X		
ENSC 163	4	Hydrology	Prerequisite(s): ENSC 100; ENSC 101; ENSC 110; MATH 007B or MATH 009B or MATH 09HB; or consent of instructor. Introduction to the scientific study of the hydrologic cycle. Covers the measurement and evaluation of hydrologic phenomena including the use of statistical methods. Explores computer techniques in hydrology with applications to water resource development and water quality problems, particularly those in California.	X			
ENSC 165	4	Principles of Groundwater Science	Prerequisite(s): CHEM 001B; ENSC 101; MATH 007B or MATH 009B or MATH 09HB. Covers the fundamental understanding of groundwater resources and aquifer properties. Explores physical principles of fluid flow in sediments and rocks, surface water groundwater interactions, and contaminant transport. Discusses current issues in groundwater management and sustainability with an emphasis on California water resources. Students present topics related to groundwater science and management.		X		
ENSC 175	4	Spatial Analysis and Remote Sensing For Environmental Sciences	Prerequisite(s): ENSC 110; or consent of instructor. Explores the principles of spatial data analysis in environmental sciences. Provides comprehensive and systematic understanding of spatial analysis methods. Covers theory of remotely sensed data acquisition from satellites and UAVs and discusses image analysis techniques. Utilizes Geographic Information Systems (GIS) and statistical and image classification software.			X	
ENSC 177	4	Environmental Sampling and Analysis	Prerequisite(s): two of the following courses ENSC 100, ENSC 101, ENSC 102; or consent of instructor. Introduces sampling, preparation and quantitative analysis of environmental samples. Topics include environmental sampling design; sampling techniques; quality assurance/quality control (QA/QC); data collection and reporting; sample preparations; extraction and cleanup; chemical separations (chromatography); and instrumental detection methods relevant to quantitative environmental analysis.			X	
ENSC 190	1-5	Special Studies	Prerequisite(s): upper-division standing and consent of instructor. Special studies as a means of meeting special curricular problems. Graded Satisfactory (S) or No Credit (NC); however, students may petition the instructor for a letter grade. Course is repeatable.			X	
ENSC 191	2	Seminar in Professional Development in Environmental Sciences	Prerequisite(s): upper division standing in Environmental Sciences or consent of instructor. Lectures and discussions on scientific writing, critical analysis in reading, public speaking, job interview and resume preparation, and professional conduct. Students make both written and oral presentations on topics in Environmental Sciences.	X	X	X	
ENTX 101	4	Fundamental Toxicology	Prerequisite(s): BIOL 005A; BIOL 005B; CHEM 008A and CHEM 08LA or CHEM 08HA and CHEM 08HLA; CHEM 008B and CHEM 08LB or CHEM 08HB and CHEM 08HLB; CHEM 008C and CHEM 08LC or CHEM 08HC and CHEM 08HLC; or consent of instructor. Fundamental concepts relating to the adverse effects of chemical agents. Topics covered include dose-response relationships, absorption, distribution, metabolism, excretion, mechanisms of toxicity, and the effects of selected environmental toxicants on various organ systems. Characterization and assessment of risks are also covered.			X	
ENSC 200	4	Fate and Transport of Chemicals in the Environment	Prerequisite(s): one year of organic chemistry; graduate standing; or consent of instructor. Covers identification of toxicants and their sources in the environment; equilibrium partitioning of chemicals between air, water, soil, sediment, and biota using physico-chemical properties; and the transport and transformations of chemicals in air, water, and soil media. Includes case studies of fate and transport of selected toxic chemicals. Cross-listed with CHEM 246, and ENTX 200.	X			
ENSC 204	4	Fluvial Geomorphology	Prerequisite(s): graduate standing or consent of instructor. Advanced inquiry into the processes that produce fluvial landforms. The topics of erosion, sediment transport and deposition and their roles in the creation and evolution of river channels, wetlands and floodplains are explored from first principles. Field trips to representative fluvial geomorphic systems. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.			X	
ENSC/CEE 207	4	Air Quality Modeling	Prerequisite(s): CEE 202, CEE 206, ENVE 134; graduate standing; or consent of instructor. Prepares for research and entry- level positions that require knowledge of empirical and deterministic air quality modeling applications. Covers empirical model derivations and applications, box modeling, chemical transport modeling, model evaluation, model sensitivity analysis, and data visualization.		X		
ENSC 209	4	Artificial Intelligence in Toxicology and Environmental Health	Prerequisite(s): graduate standing; or consent of instructor. An introduction of fundamental principles and methodology of machine learning and artificial intelligence (AI) to investigate critical research questions within the fields of environmental science. Explores cutting-edge techniques and tools based on machine learning and AI algorithms with applications from toxicology, environmental health, and air pollution. Cross-listed with ENTX 209.			X	
ENSC 217	4	Vadose Zone Processes	Prerequisite(s): ENSC 107; or consent of instructor. Studies physical and mathematical descriptions of transient flow and transport processes in the vadose zone. Emphasizes numerical solutions to equations describing the movement of water, gas, contaminants, and heat including chemical and biological reactions. Explores mathematical models for direct and inverse solutions, spatial heterogeneity, and determination of soil hydraulic properties.	X			
ENSC 218	4	Isotopes in Ecology and Environmental Science	Prerequisite(s): graduate standing; both CHEM 001C and CHEM 01LC or both CHEM 01HC and CHEM 1HLC. Explores the principles and techniques of isotope tracer fractionation and mixing commonly used in ecology and environmental science. Introduces isotope notation, mixing models, and kinetic and equilibrium fractionation concepts. Includes case studies involving stable- and radioisotopes of carbon, nitrogen, oxygen, and sulfur. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor. Course is repeatable to a maximum of 4 units.	X			
ENSC 227	4	Global Change and the Earth System	Prerequisite(s): graduate standing; or consent of instructor. Examines the fundamental principles of Earth system science in the context of global change. Topics include the preindustrial and modern-day Earth system, responses of the Earth's support machinery to human activities, consequences of global change for human well-being, and pathways towards global sustainability.	X			

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ENSC 245	4	Chemistry and Physics of Aerosols	Prerequisite(s): CHEM 109, CHEM 110B; graduate standing; or consent of instructor. Fundamentals of chemical and physical processes controlling behavior and properties of airborne particles. Topics include particle mechanics; electrical, optical, and thermodynamic properties; nucleation; surface and aqueous-phase chemistry; gas-particle partitioning; sampling; size and chemical analysis; atmospheric aerosols; and environmental effects. Cross-listed with CHEM 245 and ENTX 245.	X			
ENSC 275	1	Research Seminar in Environmental Sciences	Prerequisite(s): graduate standing or consent of instructor. Involves seminars by faculty, visiting scholars, environmental professionals, and advanced graduate students on current research topics in Environmental Sciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.		X	X	
ENSC 401	2	Professional Development in Environmental Sciences	Prerequisite(s): graduate standing; consent of instructor. Introduces students to strategies for successful graduate study and early career development. Consists of lectures, discussions and presentations covering research and professional ethics, grant/fellowship writing, and preparation of technical journal articles. Addresses effective job search skills, including preparation of curriculum vitae, networking, effective oral presentations, and job interviews. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 4 units.	X			
ENTX 201	4	Principles of Toxicology	Prerequisite(s): BCH 110A or BCH 110HA, BCH 110B or BCH 110HB; or consent of instructor. The structure-activity and dose-response relationships of environmental toxicants; their absorption, distribution, metabolism, and excretion; and evaluation of their toxicity and factors that influence toxicity. Quantitative methods in measuring acute and chronic toxicity	X			

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