

# ENVIRONMENTAL RESOURCES ENGINEERING

## Bachelor of Science degree with a major in Environmental Resources Engineering

See *Environmental Systems for the Master of Science degree with options in Environmental Resources Engineering (ERE) and Energy Technology and Policy (ETaP)*.

### Department Chair

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For a complete description of the ERE program, including its program goals, see our webpage at [www.humboldt.edu/engineering](http://www.humboldt.edu/engineering).

### Mission Statement

The mission of the ERE program is to prepare engineers to identify and solve complex environmental resource problems. The program strives to educate leaders who will sustain, restore and protect our natural resources and the environment.

### The Program

Students completing this program will have demonstrated:

- an ability to apply knowledge of mathematics, science, and engineering
- an ability to design and conduct experiments, as well as to analyze and interpret data
- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- an ability to function on multidisciplinary teams
- an ability to identify, formulate, and solve engineering problems
- an understanding of professional and ethical responsibility
- an ability to communicate effectively
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- a recognition of the need for, and an ability to engage in, life-long learning
- a knowledge of contemporary issues

- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

HSU offers one of the largest undergraduate accredited environmental engineering programs in the United States. While studying in one of the most environmentally interesting areas of California, Environmental Resources Engineering students will learn to apply an interdisciplinary approach to understanding and resolving resource planning and management problems in their social, economic, ethical, and historical contexts.

Program coursework and research are in three primary areas: water quality, water resources, and energy resources.

Students prepare for work in industry, private practice, or government, or for continued studies in graduate school.

Potential careers include: environmental engineer, ocean engineer, sanitary engineer, hazardous waste engineer, fisheries engineer, energy engineer, groundwater engineer, air pollution engineer, water quality engineer, civil engineer, hydraulic engineer, public health engineer, solar engineer, consulting engineer, hydrologist, resource planner, and water resources engineer.

The Environmental Resources Engineering program at Humboldt State University is accredited by the Engineering Accreditation Commission of ABET (111 Market Place, Suite 1050, Baltimore, MD 21202-4012, 410-347-7700).

### Preparation

High school students should take courses in biology, chemistry, physics, mathematics, critical thinking, and oral/written communications.

### REQUIREMENTS FOR THE MAJOR

For a description of degree requirements to be fulfilled in addition to those listed below for the major, please see "The Bachelor's Degree" section of the catalog, pp. 61-77, and "The Master's Degree" section of the catalog, pp. 78-80.

A minimum grade of C- is required for all courses in the major. Grades of D, D+, F, WU, and NC count as failed attempts. Required courses in the major may not be repeated more than one time. If a student has two failed attempts in a required course, the student will not be able to graduate with an ERE degree.

### Lower Division

- BIOL 105 (4) Principles of Biology  
CHEM 109/CHEM 110 (5/5) General Chemistry I, II  
MATH 109/MATH 110/MATH 210 (4/4/4) Calculus I, II, III  
PHYX 110 (4) General Physics II  
ENGR 115 (3) Intro to Environmental Resources Engineering  
ENGR 210 (3) Solid Mechanics: Statics  
ENGR 211 (3) Solid Mechanics: Dynamics  
ENGR 215 (3) Introduction to Design  
ENGR 225 (3) Computational Methods for Environmental Engineering I

### Upper Division

- ENGR 313 (3) Systems Analysis  
ENGR 322 (4) Environmental Data Modeling & Analysis  
ENGR 325 (3) Computational Methods for Environmental Engineering II  
ENGR 326 (3) Computational Methods for Environmental Engineering III  
ENGR 330 (3) Mechanics & Science of Materials  
ENGR 331 (3) Thermodynamics & Energy Systems I  
ENGR 333 (4) Fluid Mechanics  
ENGR 351 (4) Water Quality & Environmental Health  
ENGR 410 (3) Environmental Impact Assessment  
ENGR 416 (3) Transport Phenomena  
ENGR 440 (3) Hydrology I  
ENGR 492 (3) Capstone Design Project

### Major Elective Program

With advice and approval of an Environmental Resources Engineering faculty advisor and the department chair, select one upper division science or natural resources course and three senior engineering design courses from the following lists to form a coherent elective program.

- One science/natural resources course:  
BIOL 330 (4) Principles of Ecology  
CHEM 328 (4) Brief Organic Chemistry  
FISH 320 (3) Limnology  
GEOL 306 (3) General Geomorphology  
PHYX 315 (3) Intro to Electronics and Electronic Instrumentation  
SOIL 360 (3) Origin and Class of Soils  
SOIL 363 (3) Wetland Soils

Three engineering design courses:

- ENGR 418 (3) Applied Hydraulics
- ENGR 421 (3) Advanced Numerical  
Methods for Engineers I
- ENGR 434 (3) Air Quality Management
- ENGR 435 (3) Solid Waste Management
- ENGR 441 (3) Hydrology II
- ENGR 443 (3) Groundwater Hydrology
- ENGR 445 (3) Water Resources  
Planning & Management
- ENGR 448 (3) River Hydraulics
- ENGR 451 (4) Water & Wastewater  
Treatment Engineering
- ENGR 452 (3) Design of Water  
Treatment & Reuse  
Systems
- ENGR 455 (3) Engineered Natural  
Treatment Systems
- ENGR 471 (3) Thermodynamics &  
Energy Systems II
- ENGR 473 (3) Building Energy Analysis
- ENGR 475 (3) Renewable Energy Power  
Systems
- ENGR 477 (3) Solar Thermal Engineering
- ENGR 481 (3) Selected Topics with  
Engineering Design
- ENGR 498 (1-3) Directed Design Project

