

# ENVIRONMENTAL RESOURCES ENGINEERING

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

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

### **Department Chair**

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### **Department of Environmental Resources Engineering**

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

### **Mission Statement**

The mission of the ERE program is to educate students to identify and solve complex environmental resources engineering problems. The program prepares responsible 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, [abet.org](http://abet.org).

### **Preparation**

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

### **REQUIREMENTS FOR THE MAJOR**

#### **Modifications to General Education Requirements**

The ERE program has approval for the following GE requirements to be fulfilled by completion of all ERE major coursework. Lower Division GE Areas A2 (3 units), A3 (3 units), D (3 units), and E (3 units); Upper Division GE Area B: (3 units). In addition, the ERE program has approval for courses fulfilling requirements in American Institutions (6 units) to count as fulfilling Lower Division GE area D requirements (6 units).

Students who change out of the ERE major are encouraged to contact the Office of the Registrar or the Academic & Career

Advising Center regarding completion of GE requirements.

*The following degree requirements must be fulfilled in addition to those listed below for the major, please see "The Bachelor's Degree" section of the catalog, pp. 66-81.*

- Lower Division GE Area A1: Written Communication (3 units)
- Lower Division GE Area C (9 units)
- American Institutions (6 units)
- Upper Division GE Area C (3 units)
- Upper Division GE Area D (3 units)
- Diversity & Common Ground (0-6 units)

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	(5)	General Chemistry I
CHEM 110	(5)	General Chemistry II
MATH 109	(4)	Calculus I
MATH 110	(4)	Calculus II
MATH 210	(4)	Calculus III
PHYX 210	(4)	General Physics B
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)	Introduction to Water Quality

- ENGR 410 (3) Environmental Health & 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 341 (5) Quantitative Analysis
- CHEM 370 (3) Earth Systems Chemistry
- FISH 320 (3) Limnology
- GEOL 306 (3) General Geomorphology
- PHYX 315 (3) Intro to Electronics & 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 (3) Directed Design Project

