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).

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For a complete description of the ERE program, including its program goals, see our webpage at www.humboldt.edu/engineering.

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, 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, http://www.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) and D: (3 units); Upper Division GE Area B: (3 units); and GE Area E (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. 66-80.

- 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/CHEM 110 (5/5) General Chemistry I, II
- MATH 109/MATH 210 (4/4) Calculus I, II
- PHXY 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) 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 328 (4) Brief Organic Chemistry
FISH 320 (3) Limnology
GEDL 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