

Environmental Engineering, B.S.

Program Educational Objectives: Graduates of the Environmental Engineering program will (1) establish an Environmental Engineering career in industry, government, or academia and achieve professional licensure as appropriate; (2) demonstrate excellence and innovation in engineering problem solving and design in a global and societal context; (3) commit to lifelong learning and professional development to stay current in technology and contemporary issues; and (4) take on increasing levels of responsibility and leadership in technical and/or managerial roles. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The curriculum includes a core of mathematics, physics, chemistry, and biology, as well as engineering mechanics and methods courses. Students may select from a variety of environmental engineering courses to fulfill the remaining portion of the program and to focus their environmental engineering training in one or more of the following areas: water supply and resources, waste water management, or atmospheric systems and air pollution control. Students apply principles of sustainability, leadership, diversity, equity, and inclusion in the formulation and solution of environmental problems. Design experiences are integrated into environmental engineering courses, and seniors enroll in a capstone design course.

High School Students: See School Admissions (<http://catalogue.uci.edu/thehenrysamuelischoolofengineering/#undergraduatestudytext>) information.

Transfer Students: Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, one year of general chemistry (with laboratory), and one course in introductory programming. For course equivalency specific to each college, visit assist.org (<https://assist.org>).

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

All students must meet the University Requirements (<http://catalogue.uci.edu/informationforadmittedstudents/requirementsforabachelorsdegree/>).

All students must meet the School Requirements (<http://catalogue.uci.edu/thehenrysamuelischoolofengineering/#schoolrequirements>).

Major Requirements

Mathematics and Basic Science Courses:	
CHEM 1A	General Chemistry
or ENGR 1A	General Chemistry for Engineers
CHEM 1B- 1C	General Chemistry and General Chemistry
CHEM 1LC- 1LD	General Chemistry Laboratory and General Chemistry Laboratory
CHEM 51A	Organic Chemistry
ENGRCEE 11	Methods II: Probability and Statistics
MATH 2A- 2B	Single-Variable Calculus I and Single-Variable Calculus II
MATH 2D	Multivariable Calculus I
MATH 2E	Multivariable Calculus II
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory
PHYSICS 7D	Classical Physics
PHYSICS 7LD	Classical Physics Laboratory
Two additional basic science electives, one Earth System Science course approved for General Education II and one Biological Sciences course approved for General Education II.	
Lower-Division Engineering Elective:	
Students must take one course from the following:	
CBE 40A	Chemical Processes and Material Balances
EECS 70A	Network Analysis I

ENGR 7A- 7B	Introduction to Engineering I and Introduction to Engineering II *
ENGR 54	Principles of Materials Science and Engineering
ENGRCEE 80	Dynamics
or ENGRMAE 80	Dynamics
Engineering Topics Courses:	
Students must complete a minimum of 19 units of engineering design.	
Core Courses:	
ENGRCEE 20	Introduction to Computational Problem Solving
ENGRCEE 21	Computational Problem Solving
ENGRCEE 30	Statics
ENGRCEE 81A	Civil Engineering Practicum I
ENGRCEE 81B	Civil Engineering Practicum II
ENGRMAE 91	Introduction to Thermodynamics
ENGRCEE 110	Methods III: Modeling, Economics, and Management
ENGRCEE 130- 130L	Soil Mechanics and Soil Mechanics Laboratory
ENGRCEE 150- 150L	Mechanics of Materials and Mechanics of Materials Laboratory
ENGRCEE 160	Environmental Processes
ENGRCEE 162	Introduction to Environmental Chemistry
ENGRCEE 170	Introduction to Fluid Mechanics
ENGRCEE 181A- 181B- 181C	Senior Design Practicum I and Senior Design Practicum II and Senior Design Practicum III
Engineering Elective Courses:	
Students must take two courses each from two of the following three groups and one course from the remaining group. At least one of the Engineering electives must be one of the following courses: ENGRCEE 165, ENGRCEE 172, or ENGRCEE 178.	
Water Supply and Resources:	
ENGRCEE 171	Water Resources Engineering
ENGRCEE 172	Groundwater Hydrology
ENGRCEE 173	Watershed Modeling
ENGRCEE 176	Hydrology
ENGRCEE 178	Fluid Mechanics of Open Channels
Environmental Processes:	
ENGRCEE 163	Wastewater Treatment Process Design
ENGRCEE 164	Carbon and Energy Footprint Analysis
ENGRCEE 165	Physical-Chemical Treatment Processes
ENGRCEE 166	Microbial Processes for Bioremediation
ENGRCEE 168	Microorganisms and Climate Change
ENGRCEE 169	Environmental Microbiology for Engineers
Atmospheric Systems and Air Pollution Control:	
EARTHSS 112	Global Climate Change and Impacts
ENGRCEE 168	Microorganisms and Climate Change
ENGRMAE 110	Combustion and Fuel Cell Systems
ENGRMAE 115	Applied Engineering Thermodynamics
ENGRMAE 164	Air Pollution and Control
All additional engineering topics courses needed to satisfy school and major requirements must be approved by the faculty advisor. Environmental Engineering is an inherently interdisciplinary program. Students interested in pursuing a second degree along with Environmental Engineering may be able to substitute appropriate course work for required courses stated above. Please consult with an Engineering academic or faculty advisor.	
Engineering Professional Topics Courses:	
ENGRCEE 40	Fundamentals of Economic Analysis for Scientists and Engineers

or	
ECON 20A- 20B	Basic Economics I and Basic Economics II
ENGR 190W	Communications in the Professional World
ENGRCEE 60	Contemporary and Emerging Environmental Challenges
or UPPP 8	Introduction to Environmental Analysis and Design
(The nominal Environmental Engineering program requires 191 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)	

At most an aggregate total of 6 units of 199 or H199 courses may be used to satisfy degree requirements.

* ENGR 7A-ENGR 7B is available only to lower-division students in Fall and Winter quarters. Both ENGR 7A-ENGR 7B must be taken to be counted as one Lower-Division Engineering Elective course.

The sample program of study chart shown is typical for the major in Environmental Engineering. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their programs approved by their faculty advisor. Environmental Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

Sample Program of Study — Environmental Engineering

Freshman		
Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
CHEM 1A or ENGR 1A	CHEM 1B	CHEM 1C
Lower-Division Engineering Elective	PHYSICS 7C	CHEM 1LC
General Education	PHYSICS 7LC	PHYSICS 7D
		PHYSICS 7LD
		ENGRCEE 81A
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	MATH 2E
CHEM 51A	ENGRCEE 11	ENGRCEE 21
CHEM 1LD	ENGRCEE 81B	ENGRMAE 91
ENGRCEE 20	General Education	General Education
ENGRCEE 30		
Junior		
Fall	Winter	Spring
ENGRCEE 150	ENGRCEE 130	ENGRCEE 110
ENGRCEE 150L	ENGRCEE 130L	ENGRCEE 160
ENGRCEE 170	ENGRCEE 162	Basic Science Elective
ENGR 190W	Engineering Elective	General Education
Basic Science Elective	General Education	
Senior		
Fall	Winter	Spring
ENGRCEE 181A	ENGRCEE 181B	ENGRCEE 181C
Engineering Elective	Engineering Elective	Engineering Elective
General Education	Engineering Elective	General Education
General Education	General Education	General Education

- Civil and Environmental Engineering, M.S.
- Civil and Environmental Engineering, Ph.D.
- Civil Engineering, B.S.