ENVIRONMENTAL ENGINEERING UNDERGRADUATE MAJOR (BS, HBS)

This program is available at the following location:

- **Corvallis**

The Bachelor of Science and Honors Bachelor of Science degrees in Environmental Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The ENVE program draws upon a strong foundation in the basic sciences and prepares students for environmental engineering careers in consulting, industry, and state and local governments. It is a rigorous program incorporating course work in civil and chemical engineering, water and wastewater treatment, hazardous substance management, air pollution, and environmental health. The concept of environmental engineering design is introduced during the freshman year, with most of the design skills developed at the junior and senior level. Training culminates in team-based solutions to open-ended, realistic problems that incorporate aspects of economics, process operation and maintenance, process stability and reliability, and consideration of constraints.

The environmental engineering undergraduate curriculum is designed to meet the student objectives through relevant course content, structured collaborative learning experiences, and hands-on laboratory and design experiences in the first year through senior levels. The school has a core curriculum where students from all three programs housed within the school (CHE, BIOE, ENVE) take common courses in the areas of first-year engineering, materials and energy balances, thermodynamics, transport phenomena, and senior year unit operations.

Environmental engineering students have opportunities to obtain internships offered through the School of CBEE, and through the College of Engineering Multiple Engineering Cooperative Program (MECOP). Many scholarships are available on a competitive basis for environmental engineering undergraduate students. More detailed descriptions of the curriculum and requirements are available on our website (https://engineering.oregonstate.edu/Academics/Degrees/environmental-engineering#toc-undergraduate-information).

Program Educational Objectives (PEOs)

The PEOs represent the objectives for alumni of the Environmental Engineering program about three years after graduation, and are as follows.

Alumni of the environmental engineering program will be work-ready engineers prepared with the knowledge and skills necessary to solve contemporary environmental engineering problems. Within a few years of graduation, environmental engineering alumni will have:

1. Gained employment in the field of environmental engineering or a related field, or matriculated in an environmental engineering or related graduate or professional program.
2. Created value through analysis, data-driven tools and designing sustainable solutions to problems involving resource management, regulatory compliance, environmental processes, human health, and pollution abatement and prevention in water, air and soil.
3. Successfully communicated or defended designs and decisions using modern engineering tools and through reference to fundamental concepts of math, science, and engineering.
4. Facilitated collaboration, demonstrated leadership and built strong professional relationships by working successfully in multi-disciplinary teams and effectively communicating with a diverse group of constituents.
5. Actively participated in professional development activities that demonstrate a commitment to lifelong learning and sound professional and ethical practices, and the protection of human health and the environment.
6. Achieved Engineer in Training (EIT) certification by passing the Fundamentals of Engineering exam and gained experience relevant for professional licensure.

Major Code: 311

Upon successful completion of the program, students will meet the following learning outcomes:

- Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

Code	Title	Credits
ENGR 110 & ENGR 115 or ENGR 310	+TRANSITIONS and THE OREGON STATE ENGINEERING STUDENT [1] +TRANSITIONS	3
ENGR 102	+DESIGN ENGINEERING AND PROBLEM SOLVING	3
ENGR 103	ENGINEERING COMPUTATION AND ALGORITHMIC THINKING	3
ENGR 211	STATICS	3
ENGR 213	STRENGTH OF MATERIALS	3
ENGR 330	+INCLUSIVE AND EQUITABLE ENGINEERING	3
CH 201 & CH 204	GENERAL CHEMISTRY FOR ENGINEERING APPLICATIONS and +CHEMISTRY FOR ENGINEERING APPLICATIONS LABORATORY I	4
CH 202 & CH 205	CHEMISTRY FOR ENGINEERING MAJORS and LABORATORY FOR CH 202	4
CH 203	GENERAL CHEMISTRY FOR ENGINEERING APPLICATIONS	3
CH 331	ORGANIC CHEMISTRY	4
WR 121Z	+*COMPOSITION I	4
WR 227Z	+*TECHNICAL WRITING	4
COMM 111Z	+*PUBLIC SPEAKING	3-4

or COMM 114	+*ARGUMENT AND CRITICAL DISCOURSE	
or COMM 218Z	+*INTERPERSONAL COMMUNICATION	
MTH 251Z	+*DIFFERENTIAL CALCULUS	4
MTH 252Z	INTEGRAL CALCULUS	4
MTH 254	VECTOR CALCULUS I	4
MTH 256	APPLIED DIFFERENTIAL EQUATIONS	4
PH 211 & PH 212 & PH 213	+*GENERAL PHYSICS WITH CALCULUS and *GENERAL PHYSICS WITH CALCULUS and *GENERAL PHYSICS WITH CALCULUS	12
CBEE 211	MATERIAL BALANCES AND STOICHIOMETRY	3
CBEE 212	ENERGY BALANCES	3
CBEE 213	PROCESS DATA ANALYSIS	4
CBEE 320	PROFESSIONALISM AND ENGINEERING ETHICS	3
CBEE 414	^PROCESS ENGINEERING LABORATORY	3
CHE 311	THERMODYNAMICS	3
CHE 331	TRANSPORT PHENOMENA I	4
CHE 332	TRANSPORT PHENOMENA II	3
CHE 333	TRANSPORT PHENOMENA III	3
CHE 334	TRANSPORT PHENOMENA LABORATORY	3
ENVE 322	FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING	4
ENVE 415	ENVIRONMENTAL ENGINEERING LABORATORY	3
ENVE 421	DRINKING WATER TREATMENT PROCESSES	4
ENVE 422	WASTEWATER TREATMENT PROCESSES	4
ENVE 425	AIR POLLUTION CONTROL	3
ENVE 431	FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS	4
ENVE 456	SUSTAINABLE WATER RESOURCES DEVELOPMENT	3
ENVE 457	BIOREACTORS	3
ENVE 490	+ENVIRONMENTAL ENGINEERING DESIGN	4
Biological Science Elective		
Select one course from the following:		3-5
BEE 270	ECOLOGY FOR ENGINEERS	
BEE 362	ECOLOGICAL ENGINEERING MICROBIAL PROCESSES	
BI 221Z	+*PRINCIPLES OF BIOLOGY: CELLS	
MB 230	+*INTRODUCTORY MICROBIOLOGY	
MB 255	+*ALLIED HEALTH MICROBIOLOGY	
MB 314	AQUATIC MICROBIOLOGY	
Earth Science Elective		
Select one of the following:		4
CLIM 201	+*CLIMATE SCIENCE	
ENSC 210	+*ENVIRONMENTAL EARTH SCIENCES	
GEO 487	+HYDROGEOLOGY	
OC 201	+*OCEANOGRAPHY	
SOIL 205 & SOIL 206	SOIL SCIENCE and +*SOIL SCIENCE LABORATORY FOR SOIL 205	
Restricted Electives		
Select a total of 21 credits with a minimum of 12 upper-division credits [2]		21
Core Education		
+Arts & Humanities		6
+Social Science		3
+Difference, Power & Oppression Foundations		3
+Seeking Solutions		3
Total Credits		**180**

* Baccalaureate Core course. Applies to general education requirements for undergraduate students in a catalog year up to 2024-2025

\+ Core Education course. Applies to general education requirements for undergraduate students in catalog year 2025-2026 and beyond

^ Writing Intensive Curriculum (WIC) course

[1] Students who complete CORE 100 or CORE 300 or a non-ENGR Transitions course will use an Engineering elective course to substitute for ENGR 115

[2] The unit faculty and advisors maintain an approved list of Restricted Electives that range from specific courses in AEC, AG, ATS, BEE, BHS, BI, BRR, CE, CH, CHE, CS, EAH, ECE, ECON, ENGR, ESE, FE, GEO, GEOG, GOEG, H, HEST, IE, MB, MTH, PPOL, SOC, SUS and TOX. Students should consult the unit to develop their specific program of study to ensure courses are approved as an ABET elective

Major Code: 311

Degree plans are subject to change and the following is only an example of how students may complete their degree in four years. Students should consult their advisor to determine the best degree plan for them. Contact details for advisors can be found on the Academic Advising *(https://catalog.oregonstate.edu/advising/) page.*

First Year		
Fall		**Credits**
CH 201 & CH 204	GENERAL CHEMISTRY FOR ENGINEERING APPLICATIONS and +CHEMISTRY FOR ENGINEERING APPLICATIONS LABORATORY I	4
ENGR 110 & ENGR 115 or ENGR 310	+TRANSITIONS or +TRANSITIONS	3
MTH 251Z	+*DIFFERENTIAL CALCULUS	4
WR 121Z	+*COMPOSITION I	4
	Credits	**15**
Winter		
CH 202 & CH 205	CHEMISTRY FOR ENGINEERING MAJORS and LABORATORY FOR CH 202	4
COMM 114 or COMM 111Z or COMM 218Z	+*ARGUMENT AND CRITICAL DISCOURSE or +*PUBLIC SPEAKING or +*INTERPERSONAL COMMUNICATION	3-4
ENGR 102	+DESIGN ENGINEERING AND PROBLEM SOLVING	3
MTH 252Z	INTEGRAL CALCULUS	4
	Credits	**14**
Spring		
CH 203	GENERAL CHEMISTRY FOR ENGINEERING APPLICATIONS	3
ENGR 103	ENGINEERING COMPUTATION AND ALGORITHMIC THINKING	3
MTH 254	VECTOR CALCULUS I	4
PH 211	+*GENERAL PHYSICS WITH CALCULUS	4
	Credits	**14**
Second Year		
Fall		
CBEE 211	MATERIAL BALANCES AND STOICHIOMETRY	3
CH 331	ORGANIC CHEMISTRY	4
MTH 256	APPLIED DIFFERENTIAL EQUATIONS	4
PH 212	*GENERAL PHYSICS WITH CALCULUS	4
	Credits	**15**
Winter		
CBEE 212	ENERGY BALANCES	3
ENGR 211	STATICS	3
PH 213	*GENERAL PHYSICS WITH CALCULUS	4
WR 227Z	+*TECHNICAL WRITING	4
Core Ed: Arts & Humanities General		3
	Credits	**17**
Spring		
CBEE 213	PROCESS DATA ANALYSIS	4
ENGR 213	STRENGTH OF MATERIALS	3
Restricted Elective		4

Core Ed: Difference, Power & Oppression Foundations		3
	Credits	**14**
Third Year		
Fall		
CBEE 320	PROFESSIONALISM AND ENGINEERING ETHICS	3
CHE 311	THERMODYNAMICS	3
CHE 331	TRANSPORT PHENOMENA I	4
Restricted Elective		3
Core Ed: Social Science		3
	Credits	**16**
Winter		
CHE 332	TRANSPORT PHENOMENA II	3
ENVE 322	FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING	4
Biological Science Elective		3-5
Restricted Elective		4
	Credits	**15**
Spring		
CHE 333	TRANSPORT PHENOMENA III	3
CHE 334	TRANSPORT PHENOMENA LABORATORY	3
Earth Science Elective		4
Restricted Elective		4
	Credits	**14**
Fourth Year		
Fall		
ENVE 421	DRINKING WATER TREATMENT PROCESSES	4
ENVE 457	BIOREACTORS	3
CBEE 414	^PROCESS ENGINEERING LABORATORY	3
Restricted Elective		3
Core Ed: Seeking Solutions		3
	Credits	**16**
Winter		
ENVE 415	ENVIRONMENTAL ENGINEERING LABORATORY	3
ENVE 422	WASTEWATER TREATMENT PROCESSES	4
ENVE 431	FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS	4
Restricted Elective		3
	Credits	**14**
Spring		
ENVE 425	AIR POLLUTION CONTROL	3
ENVE 456	SUSTAINABLE WATER RESOURCES DEVELOPMENT	3
ENVE 490	+ENVIRONMENTAL ENGINEERING DESIGN	4
ENGR 330	+INCLUSIVE AND EQUITABLE ENGINEERING	3
Core Ed: Arts & Humanities Global		3
	Credits	**16**
	Total Credits	**180**

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