

# ENVIRONMENTAL ENGINEERING, B.S.

## REQUIREMENTS

### UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (<http://guide.wisc.edu/undergraduate/#requirementsforundergraduatestudytext>) section of the *Guide*.

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|-------------------|--|
| General Education | <ul style="list-style-type: none"> <li>• Breadth–Humanities/Literature/Arts: 6 credits</li> <li>• Breadth–Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits</li> <li>• Breadth–Social Studies: 3 credits</li> <li>• Communication Part A &amp; Part B *</li> <li>• Ethnic Studies *</li> <li>• Quantitative Reasoning Part A &amp; Part B *</li> </ul> |
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\* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

### SUMMARY OF REQUIREMENTS

The following curriculum applies to students who were admitted to the environmental engineering degree program (classification changed to BSEnvE) in Fall 2021 or later.

Code	Title	Credits
	Introduction to Engineering	3
	Mathematics and Statistics	19
	Basic Science	16
	Engineering Mechanics	9
	Engineering Tools	6
	Fundamental Principles	18
	Advanced Principles and Practices	33
	Communications	8
	Liberal Studies	16
	<b>Total Credits</b>	<b>128</b>

### INTRODUCTION TO ENGINEERING

Code	Title	Credits
INTEREGR 170	Design Practicum	3
	<b>Total Credits</b>	<b>3</b>

### MATHEMATICS AND STATISTICS

Code	Title	Credits
MATH 221 or MATH 217 or MATH 275	Calculus and Analytic Geometry 1 Calculus with Algebra and Trigonometry II Topics in Calculus I	5
MATH 222 or MATH 276	Calculus and Analytic Geometry 2 Topics in Calculus II	4
MATH 234	Calculus--Functions of Several Variables	4
MATH 319	Techniques in Ordinary Differential Equations	3
	<i>One of the following:</i>	3
STAT 324	Introductory Applied Statistics for Engineers	
STAT 311 & STAT 312	Introduction to Theory and Methods of Mathematical Statistics I and Introduction to Theory and Methods of Mathematical Statistics II	
	<b>Total Credits</b>	<b>19</b>

### BASIC SCIENCE

Code	Title	Credits
	<i>One of the following:</i>	5
CHEM 109	Advanced General Chemistry	
CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II	
	<i>One of the following:</i>	5
PHYSICS 202	General Physics	
PHYSICS 208	General Physics	
	<i>One of the following:</i>	3
GEOSCI 100	Introductory Geology: How the Earth Works	
GEOSCI/ ENVIR ST 106	Environmental Geology	
	<i>One of the following:</i>	3
ZOOLOGY/ BIOLOGY/ BOTANY 151	Introductory Biology	
ZOOLOGY 153	Introductory Biology	
ZOOLOGY/ BOTANY/ ENVIR ST 260	Introductory Ecology	
MICROBIO 101	General Microbiology	
	<b>Total Credits</b>	<b>16</b>

**ENGINEERING MECHANICS**

Code	Title	Credits
E M A 201	Statics (with a grade of C or better)	3
E M A 202	Dynamics	3
CIV ENGR 310	Fluid Mechanics	3
<b>Total Credits</b>		<b>9</b>

**ENGINEERING TOOLS**

Code	Title	Credits
CIV ENGR/G L E 291	Problem Solving Using Computer Tools	4
CIV ENGR 159	Civil Engineering Graphics (was ME 170 before Fall 2023)	2
<b>Total Credits</b>		<b>6</b>

**FUNDAMENTAL ENVIRONMENTAL ENGINEERING PRINCIPLES**

Code	Title	Credits
CIV ENGR 311	Hydroscience	3
CIV ENGR 320	Environmental Engineering	3
CIV ENGR 324	Environmental Engineering Thermodynamics	3
CIV ENGR 325	Environmental Engineering Materials	3
CIV ENGR 494	Civil and Environmental Engineering Decision Making	3
CIV ENGR 498	Construction Project Management	3
<b>Total Credits</b>		<b>18</b>

**ADVANCED PRINCIPLES AND PRACTICES****Environmental Engineering Experiments**

Note: Courses taken to meet this requirement may not be used to meet the environmental engineering breadth requirement.

Code	Title	Credits
One of the following lab courses:		
CIV ENGR 322	Environmental Engineering Processes	3
CIV ENGR 410	Hydraulic Engineering	
BSE 365	Measurements and Instrumentation for Biological Systems	
GEOSCI/ G L E 627	Hydrogeology	
<b>Total Credits</b>		<b>3</b>

**Senior Capstone Design**

Code	Title	Credits
CIV ENGR 578	Senior Capstone Design <sup>1</sup>	4
<b>Total Credits</b>		<b>4</b>

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At least one engineering design course as designated with an asterisk(\*) must be completed before taking CIV ENGR 578 Senior Capstone Design.

**Environmental Engineering Breadth Electives**

Code	Title	Credits
<b>At least one class in at least four of the following sub-disciplines. At least two of the courses must be designated as an engineering design course (*) and must be from different sub-disciplines. If more than one course is taken from a sub-discipline, then the additional course(s) will be counted towards the Technical and Professional Electives Requirement.</b>		
<i>Environmental Chemistry</i>		
CIV ENGR 500	Water Chemistry	
ATM OCN 638	Atmospheric Chemistry	
SOIL SCI 621	Soil Chemistry	
<i>Health Hazards and Risk Assessment</i>		
CIV ENGR 422	Elements of Public Health Engineering	
POP HLTH/ ENVIR ST 471	Introduction to Environmental Health	
POP HLTH/ ENVIR ST 502	Air Pollution and Human Health	
<i>Hydraulics</i>		
CIV ENGR 410	Hydraulic Engineering	
CIV ENGR 411	Open Channel Hydraulics	
<i>Surface Water Resources and Hydrology</i>		
BSE 473	Water Management Systems	
BSE 571	Small Watershed Engineering	
CIV ENGR 414	Hydrologic Design *	
CIV ENGR 415	Hydrology	
<i>Groundwater, Soils, and Sediments</i>		
CIV ENGR 412	Groundwater Hydraulics	
GEOSCI/ G L E 627	Hydrogeology	
<i>Water and Wastewater</i>		
CIV ENGR 426	Design of Wastewater Treatment Plants *	
CIV ENGR 428	Water Treatment Plant Design *	
<i>Air Quality and Control</i>		
CIV ENGR 423	Air Pollution Effects, Measurement and Control	
ATM OCN/ ENVIR ST 535	Atmospheric Dispersion and Air Pollution	
<i>Solid and Hazardous Waste</i>		
CIV ENGR 427	Solid and Hazardous Wastes Engineering *	
CIV ENGR 522	Hazardous Waste Management *	
<i>Energy and Environment</i>		
BSE/ ENVIR ST 367	Renewable Energy Systems	
CBE 512	Energy Technologies and Sustainability	
CIV ENGR/ G L E 421	Environmental Sustainability Engineering	
CIV ENGR/ G L E 535	Wind Energy Balance-of-Plant Design *	

GEOSCI/ Energy Resources  
ENVR ST 411

**Total Credits** 12

### Professional Electives

*Note: Courses taken to meet this requirement may not be used to meet the environmental engineering breadth requirement.*

Select 14 credits of coursework that meets at least one of the following criteria:

- Any engineering course numbered 300 or higher, excluding E P D and INTEREGR. Up to six credits of independent study (e.g. CIV ENGR 699 Independent Study and others) may be counted
- Any intermediate or advanced-level course<sup>1</sup> from atmospheric and oceanic sciences, botany, chemistry, geography, geoscience, mathematics<sup>2</sup>, microbiology, molecular and environmental toxicology, physics, population health sciences, soil science, statistics<sup>2</sup>, or zoology
- Up to three credits of any intermediate or advanced-level course from agricultural and applied economics, economics, general business, management and human resources, or INTEREGR 303 Applied Leadership Competencies in Engineering
- Up to three credits of CIV ENGR 1 Cooperative Education Program

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Courses with social science, humanities, or literature breadth (H, L, S, W, X, Y, Z) cannot be used

2

Transfer/test math elective credits for calculus or STAT 301 Introduction to Statistical Methods may not be used to fulfill Professional Electives

### COMMUNICATIONS

Code	Title	Credits
<i>Communications A (choose one)</i>		3
ENGL 100	Introduction to College Composition	
LSC 100	Science and Storytelling	
COM ARTS 100	Introduction to Speech Composition	
ESL 118	Academic Writing II	
<i>Speech-Related Course (choose one)</i>		2
E P D 275	Technical Presentations <sup>1</sup>	
COM ARTS 105	Public Speaking	
COM ARTS 181	Elements of Speech-Honors Course	
COM ARTS 262	Theory and Practice of Argumentation and Debate	
COM ARTS 266	Theory and Practice of Group Discussion	
<i>Writing-Related Course (choose one)</i>		3
INTEREGR 397	Engineering Communication <sup>1</sup>	
ENGL 201	Intermediate Composition	
<b>Total Credits</b>		<b>8</b>

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E P D 275 Technical Presentations and INTEREGR 397 Engineering Communication are strongly recommended to satisfy these requirements.

### LIBERAL STUDIES

Code	Title	Credits
<b>College of Engineering Liberal Studies Requirements</b>		<b>16</b>

Complete Requirements (<http://guide.wisc.edu/undergraduate/engineering/#requirements>)<sup>1</sup>

#### Requirements specific to Environmental Engineering:

*An economics course must be selected from the following list:*

ECON 101	Principles of Microeconomics
ECON 102	Principles of Macroeconomics
ECON 111	Principles of Economics-Accelerated Treatment

A minimum of three credits of environmental studies course that meets the breadth designations of Humanities, Literature, and/or Social Studies. Courses that also carry breadth designations of Biological Sciences, Natural Sciences, or Physical Sciences will not count towards this requirement.

**Total Credits** 16

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All liberal studies credits must be identified with the letter H, S, L, or Z. Language courses are acceptable without the letter and are considered humanities. An economics elective and an environmental studies elective are required.

Note: See an environmental engineering advisor for additional information.

### HONORS IN RESEARCH

Students in environmental engineering that have completed at least two semesters on the Madison campus with a cumulative GPA of **at least 3.5** may apply to participate in the Honors in Research program. Students may register for 1 to 3 credits per semester. A grade of P (Progress) will be assigned each semester until the student completes the honors in research program or drops out of the program, at which time a final grade is assigned (based on research progress and the written thesis, if completed). This becomes the grade for all credits taken in CIV ENGR 489 Honors in Research.

A senior thesis worth 3 credits of CIV ENGR 489 is required. The senior thesis is a written document reporting on a substantial piece of work that is prepared in the style of a graduate thesis. The thesis advisor determines the grade which the student receives for the thesis. A bound copy of the thesis must be submitted to the Department of Civil and Environmental Engineering office to complete the program.

The designation "Honors in Research" will be recorded on the student's transcript if the following criteria are met:

1. Satisfaction of requirements for an undergraduate degree in Environmental Engineering.
2. A cumulative grade-point average of at least 3.3.
3. Completion of a total of at least 8 credits in CIV ENGR 489.
4. Completion of a senior honors thesis with a final grade of B or better.

Students interested in the Honors in Research program should contact their advisor or the BSEnvE chair for more information. Applications to the program are to be submitted to the BSEnvE chair with a supporting letter

from the student's academic and thesis advisors. Decisions regarding acceptance are made by the BSEnE chair.

## UNIVERSITY DEGREE REQUIREMENTS

**Total Degree** To receive a bachelor's degree from UW–Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.

**Residency** Degree candidates are required to earn a minimum of 30 credits in residence at UW–Madison. "In residence" means on the UW–Madison campus with an undergraduate degree classification. "In residence" credit also includes UW–Madison courses offered in distance or online formats and credits earned in UW–Madison Study Abroad/Study Away programs.

**Quality of Work** Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.