Environmental Engineering, BSE

Requirements

The Bachelor of Science in Engineering (BSE) with a major in environmental engineering requires a minimum of 128 s.h. of credit, plus up to two professional skills seminars. At the time of graduation, students must have a cumulative grade-point average of at least 2.00 in all college work used to complete degree requirements and in all UI coursework in order to be awarded the BSE.

All BSE students are required to take the same collegiate curriculum. For information about these collegiate requirements, see the Bachelor of Science in Engineering, BSE in the catalog. 6 s.h. of a student's major courses fulfill the basic science or college-level math collegiate requirement. Students completing the major in environmental engineering fulfill the collegiate statistics requirement by completing STAT:2020 Probability and Statistics for the Engineering and Physical Sciences. The focus area may require specific courses to count toward the general education component of the collegiate curriculum; see the section titled "Focus Area."

The major in environmental engineering may include the following professional skills seminars depending on when a student declares the major.

Course #	Title	Hours
CEE:1010	Introduction to Careers in Environmental Engineering (typically taken spring semester of the first year)	0
CEE:2010	Civil and Environmental Engineering Professional Practice and Ethics (typically taken in the spring semester of the second year)	1

The BSE with a major in environmental engineering requires the following coursework.

Requirements	Hours
Collegiate Curriculum	49
Basic Science and College-Level Math, from Major Requirements or Focus Area	6
Major Requirements	58
Focus Area	15-16

Major Requirements

Major requirements include a set of common courses (58 s.h.), three professional skills courses (3 s.h.), and one capstone design course (3 s.h.).

Common Courses

Course #	Title	Hours
All of these:		
CEE:1030	Introduction to Earth Science (no lab required)	3
or SEES:1080	Introduction to Environmental Science	
CEE:3155	Principles of Environmental Engineering (with lab)	4
CEE:3371	Principles of Hydraulics and Hydrology	3
CEE:3430	Water Treatment (with lab)	4
CEE:4102	Groundwater	3
CEE:4150	Environmental Chemistry	3
CEE:4157	Environmental Engineering Design	3
CEE:4158	Solid and Hazardous Wastes	3
CEE:4159	Air Pollution Control Technology	3
CEE:4374	Water Resource Design	3
BIOL:1411	Foundations of Biology	4
CHEM:1120	Principles of Chemistry II	4
CHEM:2210	Organic Chemistry I (no lab required)	3
ENGR:2110	Statics	2
ENGR:2130	Thermodynamics	3
ENGR:2510	Fluid Mechanics	4
ENGR:2710	Dynamics	3
ENGR:2720	Materials Science	3

Professional Skills

Course #	Title	Hours
All of these:		
CEE:3001	Leadership Skills for Engineers	1
CEE:3002	Technical Communication in Civil and Environmental Engineering	1
CEE:3003	Project Management Skills	1

Capstone Design Course

Course #	Title	Hours
This course:		
CEE:4850	Project Design and Management in Civil Engineering	3

Focus Area

Students must select focus area courses according to guidelines established by the Department of Civil and Environmental Engineering. Environmental engineering students may choose from several standard focus areas developed by the department or create an individual focus area tailored to their interests.

The department offers standard focus areas are offered in chemistry [p. 2], ecological engineering [p. 2], environmental [p. 3], geoscience [p. 3], hydrosciences [p. 3], informatics [p. 4], public health [p. 4], sustainability [p. 4], and urban studies [p. 5]. To see guidelines related to tailored focus areas, see Environmental Engineering Focus Areas on the Department of Civil and Environmental Engineering website.

Focus areas in environmental engineering consist of content area courses and electives; carefully selected elective courses may contribute to earning a minor and/or certificate.

Chemistry

Students in the chemistry focus area complete at least 9 s.h. in chemistry electives and at least 6 s.h. in additional electives.

Chemistry Electives

Course #	Title	Hours
At least 9 s.h. from these:		
CHEM:2220	Organic Chemistry II	3
CHEM:2410	Organic Chemistry Laboratory	3
CHEM:3110	Equilibria and Electrochemistry	3
CHEM:3120	Spectroscopy and Separations	3
CHEM:3250	Inorganic Chemistry	3
CHEM:3430	Analytical Measurements	3
CHEM:3440	Physical Measurements	3
CHEM:3530	Inorganic Chemistry Laboratory	3
CHEM:4431	Chemical Thermodynamics	3
CHEM:4432	Quantum Mechanics and Chemical Kinetics	3
Another course approved for the minor in chemistry; see "Chemistry, Minor" in the College of Liberal Arts and Sciences section of the catalog.		3

Additional Electives–Chemistry Focus Area

Course #	Title	Hours
At least 6 s.h. from these:		
CEE:2015	Civil Engineering Tools	2
CEE:4107/CBE:4410	Sustainable Systems	3
CEE:4119	Hydrology	3
CEE:4371	Water Resources Engineering	3
CPH:3400/ SEES:3250	Health, Work, and the Environment	3
ECON:3625/ URP:3135	Environmental and Natural Resource Economics	3
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3
OEH:4240	Global Environmental Health	3
SEES:2050	Foundations of GIS	4
A civil and environmental engineering course (prefix CEE) numbered 3000 or above		3

Ecological Engineering

Students in the ecological engineering focus area complete two required courses (4 s.h.) and at least 11 s.h. in ecological engineering and additional electives.

Required Ecological Engineering Courses

Course #	Title	Hours
Both of these:		
BIOL:2673/ SEES:2673	Ecology	3
SEES:1081	Introduction to Environmental Sciences Laboratory	1

Ecological Engineering Electives

Students can view courses applicable for the minor in earth and environmental sciences in the College of Liberal Arts and Sciences section of the catalog.

Course #	Title	Hours
At least one of these (minimum 3 s.h.):		
SEES:2950	Environmental Conservation	4
SEES:3315	Ecosystem Ecology	4
SEES:3350	Urban Ecology	3
SEES:3500/ IGPI:3500	Introduction to Environmental Remote Sensing	3
SEES:4110	Global Biogeochemical Cycles	3
SEES:4310	Climate Change	3
A course that counts toward the minor in earth and environmental sciences		3-4
At least one of these:		
CHEM:3430	Analytical Measurements	3
SEES:2001	Second-Year Field Trip for Earth and Environmental Sciences	1
SEES:2831	Geologic Field Methods	3
SEES:3001	Third-Year Field Trip for Earth and Environmental Sciences	1
SEES:3095	Field Ecology	4
SEES:3096	Winter Ecology	2
SEES:3230	Prairie Restoration	3
SEES:4001	Fourth-Year Field Trip for Earth and Environmental Sciences	2
SEES:4010	Field Methods in Physical Geography	3
SEES:4680	Field Methods in Hydrologic Science	3
A course that counts toward the minor in earth and environmental sciences		2-4

Additional Electives–Ecological Engineering Focus Area

Students select additional electives from the preceding ecological engineering electives or from the following list to bring the total for the focus area to 15 s.h. Courses not listed here may be counted with departmental approval.

Course #	Title	Hours
CEE:2015	Civil Engineering Tools	2
ECON:3625/ URP:3135	Environmental and Natural Resource Economics	3
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3
OEH:4240	Global Environmental Health	3
SEES:2050	Foundations of GIS	4

SEES:3210	Principles of Paleontology	3
A civil and environmental engineering course (prefix CEE) numbered 3000 or above		

Environmental

Students in the environmental focus area complete two content area courses (6 s.h.) and three additional electives (9 s.h.).

Environmental Electives

Course #	Title	Hours
Two of these:		
CEE:4107/CBE:4410	Sustainable Systems	3
CEE:4119	Hydrology	3
CEE:4371	Water Resources Engineering	3

Additional Electives–Environmental Focus Area

Students complete 9 s.h. in additional electives. These electives may include any Department of Civil and Environmental Engineering course (prefix CEE) not already taken for the major numbered 3000 or above.

The following courses are additional suggested electives in the environmental focus area.

Course #	Title	Hours
CPH:3400/ SEES:3250	Health, Work, and the Environment	3
CPH:3500/ GHS:3500	Global Public Health	3
ECON:3625/ URP:3135	Environmental and Natural Resource Economics	3
ENGR:2120	Electrical Circuits	3
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3
LAW:8992	Water Law	arr.
OEH:4240	Global Environmental Health	3
SEES:2050	Foundations of GIS	4

Geoscience

Students in the geoscience focus area complete two required courses (4 s.h.) and at least 11 s.h. in geoscience and additional electives.

Required Geoscience Courses

Course #	Title	Hours
All of these:		
SEES:1081	Introduction to Environmental Sciences Laboratory	1
SEES:3020	Earth Surface Processes	3

Geoscience Electives

Course #	Title	Hours
At least one of these:		
SEES:2410	Mineralogy	4
SEES:3080	Introduction to Oceanography	2
SEES:3320	Earth's Climate System	3
SEES:3360	Soil Genesis and Geomorphology	3
SEES:3380/ CEE:3328	Fluvial Geomorphology	3
SEES:3390	Integrated Watershed Analysis	3
SEES:4490	Elements of Geochemistry	3
SEES:4790	Applied Environmental Geology	3
SEES:4800	Global Geophysics	3
At least one of these:		
SEES:4010	Field Methods in Physical Geography	3
SEES:4680	Field Methods in Hydrologic Science	3

Additional Elective–Geoscience Focus Area

Students select additional electives from the preceding geoscience electives or from the following list to bring the total for the focus area to 15 s.h. Students can view courses applicable for the minor in earth and environmental sciences in the College of Liberal Arts and Sciences section of the catalog.

Course #	Title	Hours
CEE:2015	Civil Engineering Tools	2
CPH:3400/ SEES:3250	Health, Work, and the Environment	3
ECON:3625/ URP:3135	Environmental and Natural Resource Economics	3
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3
OEH:4240	Global Environmental Health	3
SEES:2050	Foundations of GIS	4
A civil and environmental engineering course (prefix CEE) numbered 3000 or above		3
A course that counts toward the minor in earth and environmental sciences		1-4

Hydrosciences

Students in the hydrosciences focus area complete four required courses (10 s.h.), one hydrosciences elective (3–4 s.h.), and one field methods elective (3 s.h.).

Required Hydrosciences Courses

Course #	Title	Hours
All of these:		
CEE:4119	Hydrology	3
CEE:4371	Water Resources Engineering	3
SEES:1081	Introduction to Environmental Sciences Laboratory	1
SEES:3020	Earth Surface Processes	3

Hydrosciences Elective

Course #	Title	Hours
One of these:		
SEES:3380/ CEE:3328	Fluvial Geomorphology	3
SEES:3390	Integrated Watershed Analysis	3
SEES:4490	Elements of Geochemistry	3
SEES:4630	Hydrogeology	4
SEES:4640	Contaminant Hydrogeology	3
SEES:4790	Applied Environmental Geology	3

Field Methods Elective–Hydrosciences

Course #	Title	Hours
One of these:		
SEES:4010	Field Methods in Physical Geography	3
SEES:4680	Field Methods in Hydrologic Science	3

Informatics

Students in the informatics focus area complete three required courses (10 s.h.) and two informatics electives (at least 5 s.h.).

Required Informatics Courses

Course #	Title	Hours
All of these:		
CS:2110	Programming for Informatics	4
CS:2420	Analyzing Data for Informatics	3
CS:2520	Human-Computer Interaction for Informatics	3

Informatics Electives

Course #	Title	Hours
At least 5 s.h. from these:		
CEE:2015	Civil Engineering Tools	2
CPH:3400/ SEES:3250	Health, Work, and the Environment	3
ECON:3625/ URP:3135	Environmental and Natural Resource Economics	3
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3
OEH:4240	Global Environmental Health	3
SEES:2050	Foundations of GIS	4
A civil and environmental engineering course (prefix CEE) numbered 3000 or above		3

Public Health

Students in the public health focus area complete one required course (3 s.h.), three focus area electives (9 s.h.), and at least 3 s.h. in additional electives.

Students in the public health focus area are required to complete the undergraduate certificate in public health in the College of Public Health. The public health focus area requires CPH:1400 Fundamentals of Public Health as part of the collegiate curriculum general education component.

Required Public Health Course

Course #	Title	Hours
This course:		
CPH:1600	Public Health Science: Inquiry and Investigation in Public Health	3

Public Health Electives

Course #	Title	Hours
Three of these:		
CPH:1800	Social and Psychological Determinants of Health: Changing Behavior, Improving Health	3
CPH:2400	The U.S. Health System in a Global Context	3
CPH:3400/ SEES:3250	Health, Work, and the Environment	3
CPH:3500/ GHS:3500	Global Public Health	3

Additional Elective–Public Health Focus Area

Students complete at least 3 s.h. in additional electives. The following courses are suggested electives in the public health focus area. Students can view courses applicable for the Certificate in Public Health in the College of Public Health section of the catalog.

Course #	Title	Hours
CPH:2200	Climageddon: Understanding Climate Change and Associated Impacts on Health	3
CPH:2220	Building a Healthier Tomorrow: Public Health Methods to Minimize Disease and Pollutant Exposures	3
CPH:4200	Agriculture, Food Systems, and Sustainability	3
CPH:4220/ GHS:4530/ OEH:4530	Global Road Safety	3
Courses that count toward the undergraduate Certificate in Public Health		2-3

Sustainability

Students in the sustainability focus area should complete ENGL:1510 Introduction to Environmental Literature or JMC:1800 Environmental Communication as an approved general education course. In addition, students complete two required courses (6 s.h.); one communication, ethics, and interpretation elective (3 s.h.); at least 3 s.h. in sustainability electives; and at least 3 s.h. in additional electives.

Required Sustainability Courses

Course #	Title	Hours
Both of these:		
SEES:1070	Contemporary Environmental Issues	3

SEES:2013/ BUS:2013/ URP:2013	Introduction to Sustainability	3

Communication, Ethics, and Interpretation Elective–Sustainability

Course #	Title	Hours
One of these:		
CNW:2740	The Art and Craft of Writing about the Environment	3
ENTR:3500	Social Entrepreneurship	3
FREN:1007	Nature/Ecology French Philosophy and Fiction	3
HIST:3230	American Environmental History	3
LAW:8622	International Environmental Law	3
MGMT:2000	Introduction to Law	3
RHET:3700	Advocacy and Sustainability: Crafting Stories of People, Place, and Resilience	3
SEES:4770/ AFAM:4770/ GHS:4770	Environmental Justice	3
URP:6273/ PBAF:6273	Community Development Through Creative Placemaking	3

Sustainability Elective

Course #	Title	Hours
At least 3 s.h. from these:		
CEE:4107/CBE:4410	Sustainable Systems	3
ABRD:3445	India Winterim (with consent of advisor)	arr.
ANTH:2261	Human Impacts on the Environment	3
ENTR:3700	Sustainable Innovation and Management	3
ENTR:4100	International Entrepreneurship, Culture, and Social Impact	1-3
EVNT:3180	Sustainable Events	3
GHS:4100	Topics in Global Health (when topic is sustainability)	1-3
MKTG:4250	Marketing and Sustainability	3
SEES:2930	Water Resources	3
SEES:3400	Iowa Environmental Policy in Practice	3
SEES:3760/ GHS:3760	Hazards and Society	3
TDSN:3260	Design for Production (when topic is special issues and topics in design)	4
URP:6256/ PBAF:6256	Environmental Policy	3
URP:6273/ PBAF:6273	Community Development Through Creative Placemaking	3

Additional Elective–Sustainability Focus Area

In addition to the following courses, students may select a course that fulfills requirements for the Certificate in Sustainability.

Course #	Title	Hours
At least 3 s.h. from these:		
CEE:2015	Civil Engineering Tools	2
ISE:2500	Engineering Economy	3
SEES:2050	Foundations of GIS	4
A civil and environmental engineering course (prefix CEE) numbered 3000 or above		3

Urban Studies

Students in the urban studies focus area should complete URP:3001 Planning Livable Cities as an approved general education course. In addition, students complete at least 12 s.h. in urban studies electives and at least 3 s.h. in additional electives.

Urban Studies Electives

In addition to the following courses, students may select courses that fulfill requirements for the minor in urban studies.

Course #	Title	Hours
At least 12 s.h. from these:		
CRIM:4120	Environmental Criminology	3
PBAF:3560/ POLI:3560/ RHET:3560/ SJUS:3560	Public Policy and Persuasion	3
PBAF:3570/ GHS:3570/ POLI:3570	Poverty Policy	3
URP:2020/ PBAF:2020	Environment and Society: Sustainability, Policy, and Politics	3
URP:4225/ PBAF:4225	Applied GIS for Planning and Policy Making	3
URP:4253/ PBAF:4253	Designing Sustainable and Healthy Cities	1-3
URP:4260/ PBAF:4260	Transportation Policy and Planning	3
URP:4266/ PBAF:4266	Transportation, Urban Form, and Sustainability	3
URP:4273/ PBAF:4273	Community Development Through Creative Placemaking	3
URP:4280/ PBAF:4280	Planning for Disaster Mitigation and Recovery	2-3
URP:4295	Economic Development Policy	3

Additional Elective–Urban Studies Focus Area

Course #	Title	Hours
At least 3 s.h. from these:		
CEE:2015	Civil Engineering Tools	2
CPH:3400/ SEES:3250	Health, Work, and the Environment	3

ECON:3625/ URP:3135	Environmental and Natural Resource Economics	3
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3
OEH:4240	Global Environmental Health	3
SEES:2050	Foundations of GIS	4
URP:3350/ ECON:3750/ SEES:3940	Transportation Economics	3
A civil and environmental engineering course (prefix CEE) numbered 3000 or above		3