Earth and Environmental Sciences, BS

Requirements

The Bachelor of Science with a major in earth and environmental sciences requires a minimum of 120 s.h., including 72–82 s.h. of work for the major, depending on the student's chosen track (earth and planetary science, environmental bioscience, or environmental geoscience). Students must maintain a grade-point average of at least 2.00 in all courses for the major and in all UI courses for the major. They must also complete the College of Liberal Arts and Sciences GE CLAS Core. Transfer students must complete a minimum of 15 s.h. of School of Earth, Environment, and Sustainability coursework in the major.

In planning coursework, students should be guided by the College of Liberal Arts and Sciences maximum hours rule: students earning a BS may apply a maximum of 56 s.h. earned in one department to the minimum 120 s.h. required for graduation, whether or not the coursework is accepted toward requirements for the major; students who earn more than 56 s.h. from one department may use the additional semester hours to satisfy requirements for the major (if the department accepts them), and the grades they earn become part of their grade-point average, but they cannot apply the additional semester hours to the minimum 120 s.h. required for graduation.

Students who are earning two majors from the same department (e.g., a BS in earth and environmental sciences and a BS in geographical and sustainability sciences), two degrees from the same department (e.g., a BS in earth and environmental sciences and a BA in environmental policy and planning), or a major and a minor from the same department (e.g., a BS in earth and environmental sciences and a minor in environmental policy and planning) may apply more than 56 s.h. from their home department toward their degree, but they must earn at least 56 s.h. of credit in courses outside their home department in order to graduate.

The BS with a major in earth and environmental sciences requires the following coursework.

Requirements	Hours
Foundation Courses	27
Track Courses	27-46
Electives	9-18

Foundation Courses

Course #	Title	Hours
All of these:		
SEES:1070	Contemporary Environmental Issues	3
SEES:1085	Fundamentals of Environmental Science	4
SEES:2010	Interdisciplinary Environmental Seminar	1
SEES:2050	Foundations of GIS	4
CHEM:1110	Principles of Chemistry I	4
CHEM:1120	Principles of Chemistry II	4
MATH:1850	Calculus I	4
One of these:		
SEES:4100	Computation in the Earth and Environment	3
CS:1110	Introduction to Computer Science	3
STAT:2010	Statistical Methods and Computing	3
STAT:3510/ IGPI:3510	Biostatistics	3

Tracks

Students must complete one of three tracks: earth and planetary science, environmental bioscience, or environmental geoscience. Courses taken to complete a track requirement may not also be used to satisfy the electives requirement.

Earth and Planetary Science Track

Students in the earth and planetary science track must complete 41–42 s.h. in earth and planetary science track courses, a 3–4 s.h. allied math or science course, and 9 s.h. in elective courses.

Earth and Planetary Science Track Courses

Course #	Title	Hours
All of these:		
SEES:1040	Evolution and the History of Life (with laboratory)	4
SEES:1050	Introduction to Geology	4
SEES:2200	Historical Geology	4
SEES:2410	Mineralogy	4
SEES:2831	Earth and Environmental Field Methods	3
SEES:3330	Sedimentary Geology	4
SEES:3510	Igneous and Metamorphic Petrology	4
SEES:3840	Structural Geology	4
SEES:4832	Geologic Field Analysis	3
PHYS:1511 or PHYS:1611	College Physics I Introductory Physics I	4
One of these:		
SEES:3210	Principles of Paleontology	3
SEES:3608	Planetary Geology	3
SEES:4490	Elements of Geochemistry	3
SEES:4630	Hydrogeology	4
SEES:4790	Applied Environmental Geology	3
SEES:4800	Environmental Geophysics	3

Allied Math or Science Course

Course #	Title	Hours
One of these:		
a biology course (prefix BIOL)		4
a chemistry course (prefix CHEM) numbered 1120 or above		3-4
a mathematics course (prefix MATH) numbered 1860 or above		3-4

a statistics course (prefix STAT) numbered 2000 or above		3-4
SEES:4100	Computation in the Earth and Environment	3
PHYS:1512	College Physics II	4
PHYS:1612	Introductory Physics II	4

Students with an interest in paleontology are encouraged to take BIOL:1411 Foundations of Biology and BIOL:1412 Diversity of Form and Function.

Earth and Planetary Science Track Electives

Students in this track must complete an additional 9 s.h. in elective courses. These 9 s.h. of elective courses must be in the School of Earth, Environment, and Sustainability (prefix SEES) and numbered 3000 or above. Refer to the "Electives" section that follows for information about the electives categories and their corresponding courses.

Students may not use any course to satisfy more than one requirement.

Environmental Bioscience Track

Students in the environmental bioscience track must complete 27–29 s.h. in environmental bioscience track courses and 18 s.h. in elective courses.

Environmental Bioscience Track Courses

Course #	Title	Hours
All of these:		
SEES:2673/ BIOL:2673	Ecology	3
SEES:3020	Earth Surface Processes	3
SEES:3315	Ecosystem Ecology	4
BIOL:1411	Foundations of Biology	4
BIOL:1412	Diversity of Form and Function	4
One of these:		
SEES:2374/ BIOL:2374	Biogeography	3
SEES:2950	Environmental Conservation	4
SEES:3070	Marine Ecosystems and Conservation	3
One of these:		
SEES:2310	Introduction to Climatology	3
SEES:3320	Earth's Climate System	3
One of these:		
SEES:3220	Evolution of the Vertebrates	3
BIOL:1261	Introduction to Botany	4
BIOL:2246	Entomology Lab	4
An approved organismal course at the Iowa Lakeside Laboratory (prefix IALL)		3-4

Environmental Bioscience Track Electives

Students in this track must complete at least 18 s.h. in elective courses, including at least one course from the field study category and one course from each of three other categories. At least 9 s.h. of the elective courses must be numbered 3000 or above. Refer to the "Electives" section that follows for information about the electives categories and their corresponding courses.

Students may not use any course to satisfy more than one requirement.

Environmental Geoscience Track

Students in the environmental geoscience track must complete 42 s.h. in environmental geoscience track courses and 9 s.h. in elective courses.

Environmental Geoscience Track Courses

Course #	Title	Hours
All of these:		
SEES:1050	Introduction to Geology	4
SEES:2673/ BIOL:2673	Ecology	3
SEES:3020	Earth Surface Processes	3
SEES:3330	Sedimentary Geology	4
SEES:3360	Soil Genesis and Geomorphology	3
SEES:4630	Hydrogeology	4
SEES:4790	Applied Environmental Geology	3
SEES:4800	Environmental Geophysics	3
MATH:1860	Calculus II	4
One of these sequences:		
PHYS:1511 & PHYS:1512	College Physics I and College Physics II	8
PHYS:1611 & PHYS:1612	Introductory Physics I and Introductory Physics II	8
One of these:		
SEES:2310	Introduction to Climatology	3
SEES:3320	Earth's Climate System	3

Environmental Geoscience Track Electives

Students in this track must complete at least 9 s.h. in elective courses numbered 3000 or above, including at least one course from the field study category and one from each of two other categories. Refer to the "Electives" section that follows for information about the electives categories and their corresponding courses.

Students may not use any course to satisfy more than one requirement.

Electives

Elective courses each fall into one of five categories: chemistry, earth systems, ecology and the biosphere, field study, or research and internships. All students must complete at least 3 s.h. from the field study category except for students in the earth and planetary science track. Students in the environmental bioscience track must select courses from at least three additional elective categories. Students in the environmental geoscience track must select courses from at least two additional elective categories.

Field Study Electives

Course #	Title	Hours
At least 3 s.h. from these:		
SEES:1179 & SEES:1180	Geology of National Parks: Preparation and Planning and Geology of National Parks: Field Trip	3

SEES:2001	Second-Year Field Trip for Earth and Environmental Sciences	1
SEES:2831	Earth and Environmental 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:3097	Introduction to Bird Study	2
SEES:3150	Sustainability Project	1-4
SEES:3160	Field Trip	1-3
SEES:3230	Prairie Restoration	3
SEES:4001	Fourth-Year Field Trip for Earth and Environmental Sciences	1
SEES:4010	Field Methods in Physical Geography	3
SEES:4680	Field Methods in Hydrologic Science	3
SEES:4832	Geologic Field Analysis	3
Approved Iowa Lakeside Laboratory courses (prefix IALL)		1-4

Chemistry Electives

Course #	Title	Hours
SEES:4110	Global Biogeochemical Cycles	3
SEES:4490	Elements of Geochemistry	3
CEE:4150/CBE:4420	Environmental Chemistry	3
CEE:4158/ OEH:4920	Solid and Hazardous Wastes	3
CEE:5440	Foundations of Environmental Chemistry and Microbiology	3
CHEM:2021	Fundamentals of Chemical Measurements	3
CHEM:2210	Organic Chemistry I	3
CHEM:3110	Equilibria and Electrochemistry	3
CHEM:3120	Spectroscopy and Separations	3
CHEM:3430	Analytical Measurements	3

Earth Systems Electives

Course #	Title	Hours
SEES:1050	Introduction to Geology	4
SEES:2200	Historical Geology	4
SEES:2310	Introduction to Climatology	3
SEES:2410	Mineralogy	4
SEES:3020	Earth Surface Processes	3
SEES:3080	Oceanography	3
SEES:3320	Earth's Climate System	3
SEES:3330	Sedimentary Geology	4
SEES:3360	Soil Genesis and Geomorphology	3
SEES:3380/ CEE:3328	Fluvial Geomorphology	3
SEES:3390	Integrated Watershed Analysis	3
SEES:3500/ IGPI:3500	Introduction to Environmental Remote Sensing	3
SEES:3510	Igneous and Metamorphic Petrology	4
SEES:3570	Light Detection and Ranging (LiDAR): Principles and Applications	3
SEES:3608	Planetary Geology	3
SEES:3840	Structural Geology	4
SEES:4310	Climate Change	3
SEES:4500/ IGPI:4500	Advanced Remote Sensing	4
SEES:4630	Hydrogeology	4
SEES:4640	Contaminant Hydrogeology	3
SEES:4720	Paleoclimatology	3
SEES:4760	Mineral and Petroleum Exploration Geology	3
SEES:4780	Global Stratigraphy	3
SEES:4790	Applied Environmental Geology	3
SEES:4800	Environmental Geophysics	3
SEES:4820	Tectonics and Basin Analysis	3

Ecology and the Biosphere Electives

Course #	Title	Hours
SEES:2374/ BIOL:2374	Biogeography	3
SEES:2950	Environmental Conservation	4
SEES:3070	Marine Ecosystems and Conservation	3
SEES:3210	Principles of Paleontology	3
SEES:3220	Evolution of the Vertebrates	3
SEES:3315	Ecosystem Ecology	4
SEES:3350	Urban Ecology	3
SEES:4470	Ecological Climatology	3
SEES:4600	Biogeography, Ecology, and Conservation of Mammals	4
BIOL:1261	Introduction to Botany	4
BIOL:2246	Entomology Lab	4
BIOL:2663	Plant Response to the Environment	3
BIOL:3244	Animal Behavior	3

Research and Internship Electives

Course #	Title	Hours
SEES:3150	Sustainability Project	1-3
SEES:3190	Undergraduate Directed Study	1-3
SEES:3992	Undergraduate Research	1-3
SEES:4995	Honors Thesis	arr.
BIOL:3994	Introduction to Research	1-3
BIOL:4999	Honors Research in Biology	arr.
CCP:1201	Academic Internship	1-3