Environmental Sciences, B.S.

Learning Outcomes

Environmental Sciences Program students will:

- synthesize scientific knowledge and methods across disciplines,
- comprehend and evaluate primary findings in published scientific articles,
- gain experience conducting independent research and/or reviewing scientific areas of interest, and
- effectively communicate scientific findings in written and/or oral form.

Requirements

The Bachelor of Science with a major in environmental sciences requires a minimum of 120 s.h., including 76-80 s.h. of work for the major. Students must maintain a g.p.a. of at least 2.00 in all courses for the major and in all UI courses for the major. They also must complete the College of Liberal Arts and Sciences GE CLAS Core; some courses required for the major in environmental sciences may be used to satisfy GE CLAS Core requirements.

Bachelor of Science students majoring in environmental sciences must complete requirements in three areas: the science and mathematics foundation, the environmental sciences foundation, and one of four environmental sciences tracks. During their third year of study, students are assigned a faculty advisor who specializes in their track.

The science and mathematics foundation develops fundamental skills and comprehension in biology, chemistry, geology, mathematics, and statistics. The environmental sciences foundation includes an introductory course in environmental science and additional courses that focus on remote sensing techniques, design and use of geographic information technologies, the geomorphic and environmental processes that shape the earth's surface, and ecological factors that influence the distribution and abundance of organisms.

Each of the program's four tracks focuses on areas of specialization within environmental sciences:

> biosciences (green) track—biological systems and ecological approaches;
>
> chemical sciences (yellow) track—environmental systems and chemistry;
>
> geosciences (brown) track—earth materials and surficial geologic processes; and
>
> hydrosciences (blue) track—hydrogeology and hydrogeologic systems, and water chemistry.

The tracks aim to prepare scientists who can tackle problems that require particular areas of expertise, and to help students develop the skills needed for future employment or graduate study.

The B.S. with a major in environmental sciences requires the following coursework.

Code	Title	Hours
Science and Mathematics Foundation Courses		27
Environmental Sciences Foundation Courses		16
Environmental Sciences Track Courses		33-37
Total Hours		76-80

Science and Mathematics Foundation

Students must complete at least 27 s.h. of coursework, as follows.

Code	Title	Hours
All of these:		
BIOL:1411	Foundations of Biology	4
BIOL:1412	Diversity of Form and Function	4
CHEM:1110	Principles of Chemistry I	4
CHEM:1120	Principles of Chemistry II	4
EES:1050	Introduction to Geology	4
MATH:1850	Calculus I	4
One of these:		
CHEM:2021	Fundamentals of Chemical Measurements (must be taken by chemical sciences track students)	3
STAT:3510/ IGPI:3510	Biostatistics	3
STAT:4200/ IGPI:4200	Statistical Methods and Computing	3

Environmental Sciences Foundation

Students must complete 16 s.h. of coursework, as follows.

Code	Title	Hours
All of these:		
ENVS:1085/ EES:1085	Fundamentals of Environmental Science	4
ENVS:2010/ EES:2010/ GEOG:2010	Interdisciplinary Environmental Seminar	1
ENVS:2673/ BIOL:2673	Ecology	3
ENVS:3010/ EES:3010/ GEOG:3003	Interdisciplinary Environmental Seminar	1
ENVS:3020/ EES:3020/ GEOG:3020	Earth Surface Processes	3
GEOG:1050	Foundations of GIS	4

Environmental Sciences Track Courses

Students majoring in environmental sciences must choose one of the following four tracks. Each track includes required general sciences courses, track foundation courses, field study courses, and elective courses.

Biosciences (Green) Track

The biosciences track provides the essential skills for entry-level positions that require a good knowledge of biotic systems and the ability to inventory biologic resources. The track's aim is to produce scientists who are capable of tackling environmental problems in which links and interactions with life sciences are crucial and in which a substantial knowledge of biological/ecological sciences is required. The track also provides a strong foundation for graduate or professional training in disciplines such as ecology, wildlife management, and natural resource management.

Students must complete at least 33 s.h., including one field study course, as follows.

Biosciences Track: Foundation

Code	Title	Hours
These three courses:		
BIOL:2512	Fundamental Genetics	4
BIOL:3172	Evolution	4
GEOG:2374/ BIOL:2374	Biogeography	3
At least 9 s.h. from these:		
BIOL:2246	Entomology Lab	4
BIOL:4373/ IGPI:4373	Molecular Evolution: Genes, Genomes, and Organisms	3
EES:3030/ ENVS:3030	Conservation Paleobiology	4
EES:3070	Marine Ecosystems and Conservation	3
EES:3220	Evolution of the Vertebrates	4
ENVS:3100/ EES:3100	Introduction to Applied Remote Sensing	3-4
or GEOG:3500/ IGPI:3500	Introduction to Environmental Remote Sensing	
GEOG:2950	Environmental Conservation	3
GEOG:3315	Ecosystem Ecology	3
GEOG:3350	Urban Ecology	3
GEOG:4470	Ecological Climatology	3

Iowa Lakeside Laboratory courses (prefix IALL) may be approved in consultation with an environmental sciences advisor

Biosciences Track: Field Study

Code	Title	Hours
At least 3 s.h. from these:		
ENVS:3095	Field Ecology	4
ENVS:3096	Winter Ecology	2
ENVS:3097	Introduction to Bird Study	2
ENVS:3230	Special Topics (must include field component)	1-4
IALL:3034	Topics in Ecology and Sustainability	2
IALL:3103	Aquatic Ecology	4
IALL:3109	Ecology and Systematics of Algae	4
IALL:3117	Ecology and Systematics of Diatoms	4
IALL:3122	Prairie Ecology	4
IALL:3126	Ornithology	2

Other Iowa Lakeside Laboratory courses (prefix IALL) may be approved in consultation with an environmental sciences advisor

Biosciences Track: Electives

Code	Title	Hours
Biosciences track students must complete at least 6 s.h. of elective coursework; additional field study and foundation courses may be approved for elective credit:		
BIOL:1261	Introduction to Botany	4
BIOL:2663	Plant Response to the Environment	3
BIOL:3244	Animal Behavior	3
BIOL:3676	Evolution Lab	4
BIOL:3994	Introduction to Research (no more than 6 s.h. of research credit may count toward the major)	2-3
BIOL:4999	Honors Research in Biology (no more than 6 s.h. of research credit may count toward the major)	arr.
CEE:5440	Foundations of Environmental Chemistry and Microbiology	3
CHEM:2210	Organic Chemistry I	3
CHEM:3110	Analytical Chemistry I	3
CHEM:3120	Analytical Chemistry II	3
EES:2200/ ENVS:2200	Historical Geology	4
EES:3080	Introduction to Oceanography	2
EES:3110/ ENVS:3110	Chemical Evolution of the Oceans	3
EES:3210	Principles of Paleontology	3
ENVS:3230	Special Topics	1-4
GEOG:2310/ EES:2310	Introduction to Climatology	3
GEOG:3310	Landscape Ecology	3
GEOG:3320/ EES:3260	Wetlands: Function, Geography, and Management	3
GEOG:3570	Light Detection and Ranging (LiDAR): Principles and Applications	3
STAT:6513/ PSQF:6243	Intermediate Statistical Methods	4

Biosciences Track: Policy

Code	Title	Hours
Biosciences track students must complete one of the following courses:		
BIOL:1260	Plants and Human Affairs	3
ECON:3625/ URP:3135	Environmental and Natural Resource Economics	3
EES:1115/ ENVS:1115/ GEOG:1115/ HIST:1115	The History and Science of Oil	3
GEOG:1070	Contemporary Environmental Issues	3

GEOG:3340	Ecosystem Services: Human Dependence on Natural Systems	3
GEOG:3400	Iowa Environmental Policy in Practice	3
GEOG:3780/ GHS:3780/ HIST:3240	U.S. Energy Policy in Global Context	3
GEOG:4750/ URP:4750	Environmental Impact Analysis	3
GEOG:4770/ GHS:4770	Environmental Justice	3

Chemical Sciences (Yellow) Track

The chemical sciences track provides the essential skills for entry-level positions that require a basic understanding of chemical principles and a working knowledge of basic chemical concepts as applied in the environment. The track's aim is to produce scientists who are capable of tackling environmental problems in which chemical and molecular processes play an important role. The track also provides a strong foundation for graduate or professional training in environmental chemistry.

Students must complete at least 33 s.h. of coursework, as follows.

Chemical Sciences Track: Foundation

Code	Title	Hours
These three courses:		
CHEM:2210	Organic Chemistry I	3
CHEM:3120	Analytical Chemistry II	3
CHEM:3250	Inorganic Chemistry	3
And 9 s.h. from this list (at least 3 s.h. must be lab hours):		
CEE:5153	Fundamentals of Environmental Sampling and Analysis	3
CHEM:2220	Organic Chemistry II	3
CHEM:2410	Organic Chemistry Laboratory	3
CHEM:3110	Analytical Chemistry I	3
CHEM:3440	Physical Measurements	3
CHEM:3530	Inorganic Chemistry Laboratory	3
CHEM:4430	Principles of Physical Chemistry	3
CHEM:4431	Physical Chemistry I	3
CHEM:4432	Physical Chemistry II	3
CHEM:4450	Synthesis and Measurement	3

Chemical Sciences Track: Lab and Field Study

Code	Title	Hours
This course:		
CHEM:3430	Analytical Measurements	3

Chemical Sciences Track: Electives

Code	Title	Hours
Chemical sciences track students must complete at least 9 s.h. of elective coursework chosen from the following lists; students may petition the chemistry department's environmental sciences advisor to use appropriate Department of Chemistry courses numbered 3000 and above as electives; additional foundation courses may be approved for elective credit:		
ENVS:3110/ EES:3110	Chemical Evolution of the Oceans	3
ENVS:3230	Special Topics (no more than 6 s.h. may count toward the major)	1-4
BIOC:3110	Biochemistry	3
CEE:4150/CBE:4420	Environmental Chemistry	3
CEE:4158/ OEH:4920	Solid and Hazardous Wastes	3
CHEM:3994	Undergraduate Research (no more than 6 s.h. of research credit may count toward the major)	1-4
CHEM:4760	Radiochemistry: Energy, Medicine, and the Environment	3
CHEM:4873	Atmospheric and Environmental Chemistry	3
EES:2200/ ENVS:2200	Historical Geology	4
EES:3100/ ENVS:3100	Introduction to Applied Remote Sensing	4
EES:4490	Elements of Geochemistry	3
EES:4520	Isotope Geochemistry	3
EES:4640	Contaminant Hydrogeology	3
GEOG:2310/ EES:2310	Introduction to Climatology	3
GEOG:2950	Environmental Conservation	3
GEOG:3500/ IGPI:3500	Introduction to Environmental Remote Sensing	3

Chemical Sciences Track: Policy

Code	Title	Hours
Chemical sciences track students must complete at least one of the following courses:		
BIOL:1260	Plants and Human Affairs	3
ECON:3625/ URP:3135	Environmental and Natural Resource Economics	3
EES:1115/ ENVS:1115/ GEOG:1115/ HIST:1115	The History and Science of Oil	3
GEOG:1070	Contemporary Environmental Issues	3
GEOG:2930	Water Resources	3
GEOG:3340	Ecosystem Services: Human Dependence on Natural Systems	3
GEOG:3400	Iowa Environmental Policy in Practice	3

GEOG:3780/ GHS:3780/ HIST:3240	U.S. Energy Policy in Global Context	3
GEOG:4750/ URP:4750	Environmental Impact Analysis	3
GEOG:4770/ GHS:4770	Environmental Justice	3

Geosciences (Brown) Track

The geosciences track provides the essential skills for entry-level positions that require a basic understanding of geologic principles and a working knowledge of basic geologic concepts applied in the environmental industry. The track's aim is to produce scientists who are capable of tackling environmental problems in which earth materials and surficial geologic processes are of primary importance. The track also lays a strong foundation for graduate study in environmental geology, engineering geology, and natural hazards assessment.

Students must complete at least 35 s.h. of coursework, as follows.

Geosciences Track: General Sciences

Code	Title	Hours
These two courses:		
MATH:1860	Calculus II	4
PHYS:1400	Basic Physics	4
Students are strongly encouraged to take additional coursework in physics		

Geosciences Track: Foundation

Code	Title	Hours
These two courses:		
EES:2410	Mineralogy	4
EES:3300	Sedimentary Geology	4
And 7 s.h. from these:		
EES:2200/ ENVS:2200	Historical Geology	4
EES:3360/ GEOG:3360	Soil Genesis and Geomorphology	3
EES:3500	Igneous and Metamorphic Petrology	4
EES:3840	Structural Geology	4
EES:4630	Hydrogeology	4
EES:4790	Applied Environmental Geology	3

Geosciences Track: Field Study

Code	Title	Hours
One of these:		
EES:2831	Geologic Field Methods	3
EES:4680	Field Methods in Hydrologic Science	3
EES:4832	Geologic Field Analysis	3
GEOG:4010	Field Methods in Physical Geography	3

Geosciences Track: Electives

Code	Title	Hours
Geosciences track students must complete at least 6 s.h. of elective coursework chosen from the following list; additional field study or foundation courses may be approved for elective credit:		
ENVS:3100/ EES:3100	Introduction to Applied Remote Sensing	4
ENVS:3110/ EES:3110	Chemical Evolution of the Oceans	3
ENVS:3230	Special Topics	1-4
CEE:4158/ OEH:4920	Solid and Hazardous Wastes	3
EES:1290	Energy and the Environment	3
EES:1400	Natural Disasters	3
EES:3030/ ENVS:3030	Conservation Paleobiology	4
EES:3070	Marine Ecosystems and Conservation	3
EES:3080	Introduction to Oceanography	2
EES:3190	Directed Study (no more than 6 s.h. may count toward the major)	arr.
EES:3350	Active Tectonics	3
EES:3380/CEE:3328	Fluvial Geomorphology	3
EES:3390	Integrated Watershed Analysis	3
EES:3770	Global Stratigraphy	3
EES:4490	Elements of Geochemistry	3
EES:4520	Isotope Geochemistry	3
EES:4630	Hydrogeology	4
EES:4640	Contaminant Hydrogeology	3
EES:4720	Glacial and Pleistocene Geology	3
EES:4800	Solid Earth Geophysics	3
EES:4820	Tectonics and Basin Analysis	3
GEOG:2310/ EES:2310	Introduction to Climatology	3
GEOG:2950	Environmental Conservation	3
GEOG:3570	Light Detection and Ranging (LiDAR): Principles and Applications	3

Geosciences Track: Policy

Code	Title	Hours
Geosciences track students must complete at least one of the following courses:		
ENVS:1115/ EES:1115/ GEOG:1115/ HIST:1115	The History and Science of Oil	3
BIOL:1260	Plants and Human Affairs	3
ECON:3625/ URP:3135	Environmental and Natural Resource Economics	3
GEOG:1070	Contemporary Environmental Issues	3
GEOG:3340	Ecosystem Services: Human Dependence on Natural Systems	3

GEOG:3400	Iowa Environmental Policy in Practice	3
GEOG:3760/ GHS:3760	Hazards and Society	3
GEOG:3780/ GHS:3780/ HIST:3240	U.S. Energy Policy in Global Context	3
GEOG:4750/ URP:4750	Environmental Impact Analysis	3
GEOG:4770/ GHS:4770	Environmental Justice	3

Hydrosciences (Blue) Track

The hydrosciences track provides the essential skills for entry-level positions that require a basic understanding of geologic principles and a working knowledge of hydrogeology and hydrogeochemistry. The track's aim is to produce scientists who are capable of tackling environmental problems that emphasize hydrogeologic systems and for which substantial knowledge of hydrogeology and water chemistry are essential. The track also lays a strong foundation for graduate education in hydrogeology, hydrology, geochemistry, and aqueous chemistry.

Students must complete at least 37 s.h. of coursework, as follows.

Hydrosciences Track: General Sciences

Code	Title	Hours
These three courses:		
MATH:1860	Calculus II	4
PHYS:1511	College Physics I	4
PHYS:1512	College Physics II	4

Hydrosciences Track: Foundation

Code	Title	Hours
These two courses:		
EES:4630	Hydrogeology	4
EES:4790	Applied Environmental Geology	3
And 6 s.h. from these:		
ENVS:3110/ EES:3110	Chemical Evolution of the Oceans	3
EES:3380/CEE:3328	Fluvial Geomorphology	3
EES:3390	Integrated Watershed Analysis	3
EES:4490	Elements of Geochemistry	3
EES:4640	Contaminant Hydrogeology	3
EES:4800	Solid Earth Geophysics	3

Hydrosciences Track: Field Study

Code	Title	Hours
This course:		
EES:4680	Field Methods in Hydrologic Science	3

Hydrosciences Track: Electives

Code	Title	Hours
Hydrosciences track students must complete at least 6 s.h. of elective coursework chosen from the following list; additional field study and foundation courses may be approved for elective credit:		
CEE:3371	Principles of Hydraulics and Hydrology	3
CEE:4103	Water Quality	3
CEE:4378	Hydrometeorology	3
CEE:5153	Fundamentals of Environmental Sampling and Analysis	3
CEE:5440	Foundations of Environmental Chemistry and Microbiology	3
EES:2200/ ENVS:2200	Historical Geology	4
EES:3080	Introduction to Oceanography	2
EES:3190	Directed Study (no more than 6 s.h. may count toward the major)	arr.
EES:3300	Sedimentary Geology	4
EES:3350	Active Tectonics	3
EES:3360/ GEOG:3360	Soil Genesis and Geomorphology	3
EES:4660/CEE:4104	Groundwater Modeling	3
EES:4800	Solid Earth Geophysics	3
ENVS:3100/ EES:3100	Introduction to Applied Remote Sensing	4
ENVS:3230	Special Topics	1-4
GEOG:2310/ EES:2310	Introduction to Climatology	3
GEOG:2950	Environmental Conservation	3
GEOG:3320/ EES:3260	Wetlands: Function, Geography, and Management	3
GEOG:3570	Light Detection and Ranging (LiDAR): Principles and Applications	3
GEOG:4470	Ecological Climatology	3

Hydrosciences Track: Policy

Code	Title	Hours
Hydrosciences track students must complete at least one of the following courses:		
ENVS:1115/ EES:1115/ GEOG:1115/ HIST:1115	The History and Science of Oil	3
BIOL:1260	Plants and Human Affairs	3
ECON:3625/ URP:3135	Environmental and Natural Resource Economics	3
GEOG:1070	Contemporary Environmental Issues	3
GEOG:2930	Water Resources	3
GEOG:3340	Ecosystem Services: Human Dependence on Natural Systems	3
GEOG:3400	Iowa Environmental Policy in Practice	3
GEOG:3780/ GHS:3780/ HIST:3240	U.S. Energy Policy in Global Context	3
GEOG:4750/ URP:4750	Environmental Impact Analysis	3

GEOG:4770/ GHS:4770	Environmental Justice	3

Teacher Licensure

Students interested in teaching in elementary and/or secondary schools should seek admission to the Teacher Education Program (TEP) in the College of Education.

To qualify for licensure in secondary teaching, students in the TEP complete a degree in education as well as a related College of Liberal Arts and Sciences degree. See Teacher Education Program Application and Admission on the College of Education website for details on requirements and deadlines for applying to the College of Education and about TEP choices of majors leading to licensure.

Honors

Honors in the Major

Students have the opportunity to graduate with honors in the major. Honors study provides students with opportunities to engage in independent research under the guidance of a faculty sponsor chosen from affiliated faculty of the Environmental Sciences Program. The program draws faculty members from the Departments of Anthropology, Biology, Chemistry, Civil and Environmental Engineering, Earth and Environmental Sciences, and Geographical and Sustainability Sciences. Honors students learn how to write the results of their research in the format of a scientific paper, and they have the experience of formally presenting their research as either a short seminar or a poster.

The College of Liberal Arts and Sciences requires that students who earn honors in the major maintain a minimum University of Iowa cumulative g.p.a. of 3.33. Additional grade-point average standards and requirements are set by each department or program.

Students must fulfill the following requirements:

- complete a B.S. with a major in environmental sciences with a g.p.a. of at least 3.33 in all work for the major;
- submit a research proposal to the honors director within two months of the beginning of the semester in which the research is initiated;
- complete a minimum of 6 s.h. of honors research taken over two semesters in BIOL:4999 Honors Research in Biology, CHEM:3994 Undergraduate Research, EES:3190 Directed Study, or GEOG:3992 Undergraduate Research, depending on the departmental affiliation of the faculty sponsor;
- prepare a thesis presenting the research in the format of a scientific paper with abstract, introduction, methods, results, discussion, and conclusions; the thesis must include a title page and an abstract formatted according to the specifications of the honors program and must be submitted to the honors director at least one week before the honors program deadline for submission; and
- present either a short seminar or a poster about the research at a professional meeting and/or at the University of Iowa.

Beginning in their sophomore or junior year, students should identify potential faculty sponsors by conducting a web-based survey of the research interests of the program's affiliated faculty. The student should contact potential sponsors to determine who would be willing to sponsor an honors student and what research projects the student might undertake. Students who choose a sponsor whose faculty appointment is not in the College of Liberal Arts and Sciences (CLAS) must choose a cosponsor who has a faculty appointment in CLAS.

After the student has identified a sponsor and the two have agreed on a project, the sponsor guides the student in the preparation of a research proposal that identifies the background, goals, methods, and significance of the research project. The proposal serves as the foundation of the honors thesis, which the student prepares under the sponsor's supervision upon completion of the research. Once the thesis is nearing completion or is completed, the student presents a short seminar or a poster detailing the purpose of the research.

For examples of honors projects in environmental sciences, see Honors Projects on the Environmental Sciences Program website.

University of Iowa Honors Program

In addition to honors in the major, students have opportunities for honors study and activities through membership in the University of Iowa Honors Program. Visit Honors at Iowa to learn about the University's honors program.

Membership in the UI Honors Program is not required to earn honors in the environmental sciences major.

Career Advancement

Graduates are prepared for careers in conservation, environmental assessment, hazardous waste management, park inspection and compliance, or pollution control and monitoring.

The undergraduate degree program also prepares students for graduate study in disciplines such as biology, chemistry, ecosystem sciences, environmental engineering, environmental law, environmental science, environmental sustainability, geoscience, hydrologic sciences, natural resource management, remote sensing and landscape modeling, renewable energy, and urban and regional planning.

The Pomerantz Career Center offers multiple resources to help students find internships and jobs.

Academic Plans

Four-Year Graduation Plan

The Four-Year Graduation Plan is not available for the environmental sciences major. Students work with their advisors on individual graduation plans.

Sample Plans of Study

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, see MyUI.

Environmental Sciences, B.S.

- Biosciences (Green) Track [p. 7]
- Chemical Sciences (Yellow) Track [p. 7]

- Geosciences (Brown) Track [p. 8]
- Hydrosciences (Blue) Track [p. 9]

Biosciences (Green) Track

Course	Title	Hours
First Year		
Fall		
ENVS:1085	Fundamentals of Environmental Science [a]	4
CHEM:1110	Principles of Chemistry I [a, b]	4
EES:1050	Introduction to Geology	4
ENGL:1200 or RHET:1030	The Interpretation of Literature or Rhetoric	3 - 4
CSI:1600	Success at Iowa	2
	Hours	17-18
Spring		
ENVS:2010	Interdisciplinary Environmental Seminar	1
CHEM:1120	Principles of Chemistry II	4
ENGL:1200 or RHET:1030	The Interpretation of Literature or Rhetoric	3 - 4
MATH:1850	Calculus I [a, c]	4
GE CLAS Core: Values and Culture [d]		3
	Hours	15-16
Second Year		
Fall		
ENVS:3020	Earth Surface Processes	3
BIOL:1411	Foundations of Biology	4
GE CLAS Core: World Languages First Level Proficiency or elective course [e]		4 - 5
GE CLAS Core: Historical Perspectives [d]		3
	Hours	14-15
Spring		
BIOL:1412	Diversity of Form and Function	4
GEOG:1050	Foundations of GIS	4
GE CLAS Core: World Languages Second Level Proficiency or elective course [e]		4 - 5
GE CLAS Core: Social Sciences [d]		3
	Hours	15-16
Summer		
Major: biosciences field study course		4
	Hours	4
Third Year		
Fall		
ENVS:2673	Ecology	3
BIOL:2512	Fundamental Genetics	4
Major: biosciences policy course [f]		3
GE CLAS Core: World Languages Second Level Proficiency or elective course [e]		4 - 5
	Hours	14-15
Spring		
GE CLAS Core: World Languages Fourth Level Proficiency or elective course [e]		4 - 5
BIOL:3172	Evolution	4
STAT:4200 or STAT:3510 or CHEM:2021	Statistical Methods and Computing or Biostatistics or Fundamentals of Chemical Measurements	3
GE CLAS Core: Diversity and Inclusion [d]		3
	Hours	14-15
Fourth Year		
Fall		
GEOG:2374	Biogeography	3
Major: biosciences "select 9 s.h." foundation course [f]		3
Major: biosciences "select 9 s.h." foundation course [f]		3
Major: biosciences elective course [f]		3
GE CLAS Core: Literary, Visual, and Performing Arts [d]		3
	Hours	15
Spring		
ENVS:3010	Interdisciplinary Environmental Seminar	1
Major: biosciences "select 9 s.h." foundation course [f]		3
Major: biosciences elective course [f]		3
GE CLAS Core: International and Global Issues [d]		3
Elective course [g]		3
Elective course [g]		1 - 3
Degree Application: apply on MyUI before deadline (typically in February for spring, September for fall) [h]		
	Hours	14-16
	Total Hours	122-130

a Fulfills a major requirement and may fulfill a GE requirement.

b Enrollment in chemistry courses requires completion of a placement exam.

c Enrollment in math courses requires completion of a placement exam.

d GE CLAS Core courses may be completed in any order unless used as a prerequisite for another course. Students should consult with an advisor about the best sequencing of courses.

e Students who have completed four years of a single language in high school have satisfied the GE CLAS Core World Languages requirement. Enrollment in world languages courses requires a placement exam, unless enrolling in a first-semester-level course.

f Refer to the General Catalog for course options.

g Students may use elective courses to earn credit towards the total s.h. required for graduation or to complete a double major, minors, or certificates.

h Please see Academic Calendar, Office of the Registrar website for current degree application deadlines. Students should apply for a degree for the session in which all requirements will be met. For any questions on appropriate timing, contact your academic advisor. For more information visit http://commencement.uiowa.edu/. If applicable search for "Early and Late Participation" to find this page (e.g. participate in graduation ceremony in May, degree conferral in August).

Chemical Sciences (Yellow) Track

Course	Title	Hours
First Year		
Fall		
ENGL:1200 or RHET:1030	The Interpretation of Literature or Rhetoric	3 - 4
ENVS:1085	Fundamentals of Environmental Science [a]	4
CHEM:1110	Principles of Chemistry I [a, b]	4
EES:1050	Introduction to Geology	4
CSI:1600	Success at Iowa	2
	Hours	17-18

Spring		
RHET:1030 or ENGL:1200	Rhetoric or The Interpretation of Literature	3 - 4
CHEM:1120	Principles of Chemistry II	4
ENVS:2010	Interdisciplinary Environmental Seminar	1
MATH:1850	Calculus I [a, c]	4
GE CLAS Core: Values and Culture [d]		3
	Hours	15-16
Second Year		
Fall		
GE CLAS Core: World Languages First Level Proficiency or elective course [e]		4 - 5
BIOL:1411	Foundations of Biology	4
CHEM:2021	Fundamentals of Chemical Measurements [f]	3
CHEM:2210	Organic Chemistry I	3
	Hours	14-15
Spring		
GE CLAS Core: World Languages Second Level Proficiency or elective course [e]		4 - 5
BIOL:1412	Diversity of Form and Function	4
Major: chemical sciences "select 9 s.h." foundation course [g]		3
GE CLAS Core: International and Global Issues [d]		3
	Hours	14-15
Third Year		
Fall		
GE CLAS Core: World Languages Second Level Proficiency or elective course [e]		4 - 5
ENVS:3020	Earth Surface Processes	3
Major: chemical sciences "select 9 s.h." foundation course [h]		3
Major: chemical sciences elective course [i]		3
Elective course [j]		1 - 3
	Hours	14-17
Spring		
GE CLAS Core: World Languages Fourth Level Proficiency or elective course [e]		4 - 5
CHEM:3120	Analytical Chemistry II	3
CHEM:3250	Inorganic Chemistry	3
Major: chemical sciences policy course [i]		3
	Hours	13-14
Fourth Year		
Fall		
ENVS:2673	Ecology	3
Major: chemical sciences "select 9 s.h." foundation course [k]		3
Major: chemical sciences elective course [i]		3
GE CLAS Core: Historical Perspectives [d]		3
GE CLAS Core: Social Sciences [d]		3
	Hours	15
Spring		
ENVS:3010	Interdisciplinary Environmental Seminar	1
CHEM:3430	Analytical Measurements	3
GEOG:1050	Foundations of GIS	4
Major: chemical sciences elective course [i]		3
GE CLAS Core: Literary, Visual, and Performing Arts [d]		3
GE CLAS Core: Diversity and Inclusion [d]		3
Degree Application: apply on MyUI before deadline (typically in February for spring, September for fall) [l]		
	Hours	17
	Total Hours	119-127

a Fulfills a major requirement and may fulfill a GE requirement.

b Enrollment in chemistry courses requires completion of a placement exam.

c Enrollment in math courses requires completion of a placement exam.

d GE CLAS Core courses may be completed in any order unless used as a prerequisite for another course. Students should consult with an advisor about the best sequencing of courses.

e Students who have completed four years of a single language in high school have satisfied the GE CLAS Core World Languages requirement. Enrollment in world languages courses requires a placement exam, unless enrolling in a first-semester-level course.

f This course is required for the statistics requirement in the major for all chemical sciences track students.

g The department recommends taking CHEM:2220.

h The department recommends taking CHEM:3110.

i Refer to the General Catalog for course options.

j Students may use elective courses to earn credit towards the total s.h. required for graduation or to complete a double major, minors, or certificates.

k This course must be a lab course. See the General Catalog for options.

l Please see Academic Calendar, Office of the Registrar website for current degree application deadlines. Students should apply for a degree for the session in which all requirements will be met. For any questions on appropriate timing, contact your academic advisor. For more information visit http://commencement.uiowa.edu/. If applicable search for "Early and Late Participation" to find this page (e.g. participate in graduation ceremony in May, degree conferral in August).

Geosciences (Brown) Track

Course	Title	Hours
First Year		
Fall		
ENGL:1200 or RHET:1030	The Interpretation of Literature or Rhetoric	3 - 4
ENVS:1085	Fundamentals of Environmental Science [a]	4
CHEM:1110	Principles of Chemistry I [a, b]	4
EES:1050	Introduction to Geology	4
CSI:1600	Success at Iowa	2
	Hours	17-18
Spring		
ENGL:1200 or RHET:1030	The Interpretation of Literature or Rhetoric	3 - 4
CHEM:1120	Principles of Chemistry II	4
ENVS:2010	Interdisciplinary Environmental Seminar	1
MATH:1850	Calculus I [a, c]	4
GE CLAS Core: Values and Culture [d]		3
	Hours	15-16
Second Year		
Fall		
GE CLAS Core: World Languages First Level Proficiency or elective course [e]		4 - 5
BIOL:1411	Foundations of Biology	4

MATH:1860	Calculus II	4
EES:2410	Mineralogy	4
	Hours	16-17
Spring		
GE CLAS Core: World Languages Second Level Proficiency or elective course [e]		4 - 5
BIOL:1412	Diversity of Form and Function	4
GEOG:1050	Foundations of GIS	4
GE CLAS Core: Historical Perspectives [d]		3
	Hours	15-16
Summer		
Major: geosciences field study course [f]		3 - 4
	Hours	3-4
Third Year		
Fall		
GE CLAS Core: World Languages Second Level Proficiency or elective course [e]		4 - 5
ENVS:3020	Earth Surface Processes	3
PHYS:1400	Basic Physics	4
EES:3300	Sedimentary Geology	4
	Hours	15-16
Spring		
GE CLAS Core: World Languages Fourth Level Proficiency or elective course [e]		4 - 5
CHEM:2021 or STAT:3510 or STAT:4200	Fundamentals of Chemical Measurements or Biostatistics or Statistical Methods and Computing	3
Major: geosciences "select 7 s.h." foundation course [g]		3 - 4
GE CLAS Core: Diversity and Inclusion [d]		3
	Hours	13-15
Fourth Year		
Fall		
ENVS:2673	Ecology	3
Major: geosciences "select 7 s.h." foundation course [g]		3 - 4
Major: geosciences elective course [h]		3
GE CLAS Core: Literary, Visual, and Performing Arts [d]		3
	Hours	12-13
Spring		
ENVS:3010	Interdisciplinary Environmental Seminar	1
Major: geosciences policy course [h]		3
Major: geosciences elective course [h]		3
GE CLAS Core: International and Global Issues [d]		3
GE CLAS Core: Social Sciences [d]		3
Degree Application: apply on MyUI before deadline (typically in February for spring, September for fall) [i]		
	Hours	13
	Total Hours	119-128

a Fulfills a major requirement and may fulfill a GE requirement.

b Enrollment in chemistry courses requires completion of a placement exam.

c Enrollment in math courses requires completion of a placement exam.

d GE CLAS Core courses may be completed in any order unless used as a prerequisite for another course. Students should consult with an advisor about the best sequencing of courses.

e Students who have completed four years of a single language in high school have satisfied the GE CLAS Core World Languages requirement. Enrollment in world languages courses requires a placement exam, unless enrolling in a first-semester-level course.

f It is recommended that students take EES:2831 whenever possible.

g Choose from EES:2200, EES:3360, EES:3500, EES:3840, EES:4630, EES:4790.

h Refer to the General Catalog for course options.

i Please see Academic Calendar, Office of the Registrar website for current degree application deadlines. Students should apply for a degree for the session in which all requirements will be met. For any questions on appropriate timing, contact your academic advisor. For more information visit http://commencement.uiowa.edu/. If applicable search for "Early and Late Participation" to find this page (e.g. participate in graduation ceremony in May, degree conferral in August).

Hydrosciences (Blue) Track

Course	Title	Hours
First Year		
Fall		
ENGL:1200 or RHET:1030	The Interpretation of Literature or Rhetoric	3 - 4
ENVS:1085	Fundamentals of Environmental Science [a]	4
CHEM:1110	Principles of Chemistry I [a, b]	4
EES:1050	Introduction to Geology	4
CSI:1600	Success at Iowa	2
	Hours	17-18
Spring		
RHET:1030 or ENGL:1200	Rhetoric or The Interpretation of Literature	3 - 4
ENVS:2010	Interdisciplinary Environmental Seminar	1
CHEM:1120	Principles of Chemistry II	4
MATH:1850	Calculus I [a, c]	4
GE CLAS Core: Values and Culture [d]		3
	Hours	15-16
Second Year		
Fall		
GE CLAS Core: World Languages First Level Proficiency or elective course [e]		4 - 5
BIOL:1411	Foundations of Biology	4
MATH:1860	Calculus II	4
GE CLAS Core: Historical Perspectives [d]		3
	Hours	15-16
Spring		
GE CLAS Core: World Languages Second Level Proficiency or elective course [e]		4 - 5
BIOL:1412	Diversity of Form and Function	4
PHYS:1511	College Physics I	4
Major: hydrosciences elective course [f]		3 - 4
	Hours	15-17
Third Year		
Fall		
GE CLAS Core: World Languages Second Level Proficiency or elective course [e]		4 - 5
PHYS:1512	College Physics II	4
EES:4790	Applied Environmental Geology	3

ENVS:3020	Earth Surface Processes	3
	Hours	14-15
Spring		
GE CLAS Core: World Languages Fourth Level Proficiency or elective course [e]		4 - 5
EES:4630	Hydrogeology	4
STAT:4200 or CHEM:2021 or STAT:3510	Statistical Methods and Computing or Fundamentals of Chemical Measurements or Biostatistics	3
GE CLAS Core: International and Global Issues [d]		3
Elective course [g]		1 - 3
	Hours	15-18
Summer		
EES:4680	Field Methods in Hydrologic Science [h]	3
	Hours	3
Fourth Year		
Fall		
Major: hydrosciences "select 6 s.h." foundation course [i]		3
Major: hydrosciences elective course [f]		3 - 4
ENVS:2673	Ecology	3
GEOG:1050	Foundations of GIS	4
GE CLAS Core: Literary, Visual, and Performing Arts [d]		3
	Hours	16-17
Spring		
Major: hydrosciences "select 6 s.h." foundation course [i]		3
Major: hydrosciences policy course [f]		3
ENVS:3010	Interdisciplinary Environmental Seminar	1
GE CLAS Core: Social Sciences [d]		3
GE CLAS Core: Diversity and Inclusion [d]		3
Degree Application: apply on MyUI before deadline (typically in February for spring, September for fall) [j]		
	Hours	13
	Total Hours	123-133

a Fulfills a major requirement and may fulfill a GE requirement.

b Enrollment in chemistry courses requires completion of a placement exam.

c Enrollment in math courses requires completion of a placement exam.

d GE CLAS Core courses may be completed in any order unless used as a prerequisite for another course. Students should consult with an advisor about the best sequencing of courses.

e Students who have completed four years of a single language in high school have satisfied the GE CLAS Core World Languages requirement. Enrollment in world languages courses requires a placement exam, unless enrolling in a first-semester-level course.

f Refer to the General Catalog for course options.

g Students may use elective courses to earn credit towards the total s.h. required for graduation or to complete a double major, minors, or certificates.

h This course is offered every other summer. Check MyUI for course availability since offerings are subject to change.

i Choose from EES:3110, EES:3380, EES:3390, EES:4490, EES:4640, EES:4800.

j Please see Academic Calendar, Office of the Registrar website for current degree application deadlines. Students should apply for a degree for the session in which all requirements will be met. For any questions on appropriate timing, contact your academic advisor. For more information visit http://commencement.uiowa.edu/. If applicable search for "Early and Late Participation" to find this page (e.g. participate in graduation ceremony in May, degree conferral in August).