

Geoscience, BA

The BA in geoscience offers students a background in the Earth sciences and related scientific disciplines and is designed for flexibility in potential career paths. The department focuses training in the areas of environmental geology, geochemistry, geophysics, paleontology, stratigraphy, tectonics, basin analysis, surficial processes, petrology, and volcanology. Students gain field experience along with classroom learning.

Learning Outcomes

Geoscience BA graduates will:

- understand the structure, composition, and physical processes of Earth;
- understand the coevolution of the Earth-life system;
- have experience interpreting the geologic record in the field;
- understand natural resources and resource sustainability; and
- develop a quantitative analytical skill set to integrate the diverse array of Earth sciences and related disciplines.

Requirements

The Bachelor of Arts with a major in geoscience requires a minimum of 120 s.h., including at least 56 s.h. of work for the major (at least 37 s.h. in earth and environmental sciences courses, at least 16 s.h. in supporting disciplines, and a field requirement course). 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 also must complete the College of Liberal Arts and Sciences GE CLAS Core. Transfer students must complete a minimum of 15 s.h. of coursework in the Department of Earth and Environmental Sciences.

The geoscience major for the BA is designed to provide students with a varied background in geology and a broader choice of electives than is practical in the Bachelor of Science program. It is intended for students who are interested in the fundamentals of geology or earth science teaching (see the following section, "Teacher Licensure"). Completing the minimum requirements for this degree may not adequately prepare a student for an entry-level professional job in geology.

The department recommends that students fulfill the GE CLAS Core World Languages requirement with French, German, Russian, or Spanish and the Social Sciences requirement with approved coursework in economics, geography, or anthropology.

The BA with a major in geoscience requires the following coursework.

| Requirements | Hours |
|--|-------|
| Earth and Environmental Sciences Courses | 37-40 |
| Mathematics Courses | 10 |
| Chemistry Courses | 6-8 |
| Field Requirement | 3-4 |

Earth and Environmental Sciences Courses

| Course # | Title | Hours |
|---|-----------------------------------|-------|
| Both of these: | | |
| EES:2200 | Historical Geology | 4 |
| EES:2410 | Mineralogy | 4 |
| One of these: | | |
| EES:1030 | Introduction to Earth Science | 4 |
| EES:1050 | Introduction to Geology | 4 |
| One or both of these: | | |
| EES:1040 | Evolution and the History of Life | 4 |
| EES:3210 | Principles of Paleontology | 3 |
| At least three of these: | | |
| EES:3300 | Sedimentary Geology | 4 |
| EES:3360 | Soil Genesis and Geomorphology | 3 |
| EES:3380 | Fluvial Geomorphology | 3 |
| EES:3500 | Igneous and Metamorphic Petrology | 4 |
| EES:3840 | Structural Geology | 4 |
| EES:4630 | Hydrogeology | 4 |
| And: | | |
| Earth and environmental sciences electives numbered EES:3000 or above | | 12 |

Mathematics

Students must complete the following coursework in mathematics.

| Course # | Title | Hours |
|--|-------|-------|
| College-level mathematics (may include computer science and statistics), excluding MATH:1210 | | 10 |

Chemistry

Students must complete at least two college-level chemistry courses as a sequence, as follows. Chemistry courses numbered below CHEM:1070 General Chemistry I do not count toward this requirement.

| Course # | Title | Hours |
|-------------------------|------------------------------|-------|
| One of these sequences: | | |
| CHEM:1070 & CHEM:1080 | General Chemistry I-II | 6 |
| CHEM:1110 & CHEM:1120 | Principles of Chemistry I-II | 8 |

Field Requirement

To complete the major, students must have field experience. They may take at least 4 s.h. of EES:1179 Geology of National Parks: Preparation and Planning and EES:1180 Geology of National Parks: Field Trip, and/or EES:3160 Field Trip to satisfy this requirement. Either EES:1179 and EES:1180, or EES:3160, may be repeated and/or combined to fulfill the necessary semester hours.

Alternatively, students may take one semester of EES:2831 Geologic Field Methods or the Iowa Lakeside Laboratory session for 3 s.h.

| Course # | Title | Hours |
|------------------------------|---|-------|
| At least 4 s.h. from these: | | |
| EES:1179-EES:1180 | Geology of National Parks: Preparation and Planning - Geology of National Parks: Field Trip | 3 |
| EES:3160 | Field Trip | 2 |
| Or 3 s.h. from one of these: | | |
| EES:2831 | Geologic Field Methods | 3 |
| | One natural science session at Iowa Lakeside Laboratory for a minimum of 3 s.h. | 3 |

Independent Research Option for Geoscience Majors

A junior or senior who is ready to pursue independent research for credit in geoscience may assist a faculty member or graduate student with a current research project in EES:2190 Directed Study or may initiate a small-scale project involving a combination of field, laboratory, and library investigation in EES:3190 Directed Study. Independent study is encouraged and may lead to an honors thesis in EES:4999 Honors Thesis in Geoscience or a senior thesis in EES:4990 Senior Thesis in Geoscience that may be published subsequently.

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 Apply 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.

Combined Programs

BA/MAT

Students interested in pursuing a graduate degree in teaching may apply to the combined Bachelor of Arts/Master of Arts in Teaching with a science education subprogram offered by the College of Liberal Arts and Sciences and the College of Education. The combined program enables students to earn a BA in geoscience and an MAT in five years by beginning to earn graduate credit during their fourth year of undergraduate study and by counting up to 19 s.h. of qualifying credit toward both degrees. For more information, see Science Education in the Master of Arts in Teaching (College of Education) section of the catalog. Interested students should consult an advisor.

Honors

Honors in the Major

Students have the opportunity to graduate with honors in the major. Departmental honors students must maintain a cumulative grade-point average (GPA) of at least 3.33 in all University of Iowa coursework and in all geoscience courses. Students must complete a senior thesis, registering for EES:4999 Honors Thesis in Geoscience. They must obtain approval of their honors thesis contract from their advisor and

the department's undergraduate committee, and they must earn a grade of B or higher in EES:4999.

National Honor Society

The department sponsors a chapter of Sigma Gamma Epsilon National Honor Society for the Earth Sciences. Students with an overall GPA of at least 2.80 and at least 3.20 in geoscience courses are considered for membership after they have completed a minimum of 16 s.h. of coursework in geoscience. Consult the departmental honors advisor for more information.

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 geoscience major.

Career Advancement

The BA in geoscience is designed to prepare students for employment after graduation or for admission to graduate study in an allied field of earth and environmental sciences, such as public policy, environmental engineering, law, business, archaeology, or science education. Nearly all University of Iowa geoscience graduates gain employment or move on to graduate programs following the completion of their degree.

Graduates are typically employed in environmental corporations or consulting agencies; nongovernmental organizations; law firms; and local, state, and federal agencies, in career fields that include education, conservation, urban planning, natural resources, and water resource management.

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

Academic Plans

Four-Year Graduation Plan

The following checkpoints list the minimum requirements students must complete by certain semesters in order to stay on the university's Four-Year Graduation Plan. Courses in the major are those required to complete the major; they may be offered by departments other than the major department.

These checkpoints show the range of required coursework. The major requires field trip experiences, many of which take place during breaks in or between semesters or during the summer session. These checkpoints do not include the field trip requirements.

Before the third semester begins: competence in math through trigonometry and the first required chemistry course.

Before the fifth semester begins: three to five courses in the major, including the remainder of the chemistry requirement and continuation of the mathematics requirement.

Before the seventh semester begins: 7-11 courses in the major and at least 90 s.h. earned toward the degree.

Before the eighth semester begins: 10-14 courses in the major.

During the eighth semester: enrollment in all remaining coursework in the major, all remaining GE CLAS Core courses, and a sufficient number of semester hours to graduate.

Sample Plan 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.

Geoscience, BA

| Course | Title | Hours |
|---|---|--------------|
| Academic Career | | |
| Any Semester | | |
| Research: students are strongly encouraged to be active participants in research within the department. | | |
| While only one field course is required, students are encouraged to participate in additional field experiences, whenever possible. | | |
| GE CLAS Core: Sustainability ^a | | |
| Hours | | 0 |
| First Year | | |
| Fall | | |
| EES:1030 or EES:1050 | Introduction to Earth Science ^b or Introduction to Geology | 4 |
| CHEM:1070 | General Chemistry I ^b | 3 |
| Major: math/statistics/computer science course ^{b, c} | | 3 - 4 |
| ENGL:1200 or RHET:1030 | The Interpretation of Literature or Rhetoric | 3 - 4 |
| CSI:1600 | Success at Iowa | 2 |
| Hours | | 15-17 |
| Spring | | |
| EES:2200 | Historical Geology | 4 |
| CHEM:1080 | General Chemistry II | 3 |
| Major: math/statistics/computer science course ^c | | 3 - 4 |
| ENGL:1200 or RHET:1030 | The Interpretation of Literature or Rhetoric | 3 - 4 |
| GE CLAS Core: Understanding Cultural Perspectives ^d | | 3 |
| Hours | | 16-18 |
| Second Year | | |
| Fall | | |
| EES:1040 or EES:3210 | Evolution and the History of Life ^e or Principles of Paleontology | 4 |
| EES:2410 | Mineralogy | 4 |
| Major: math/statistics/computer science course ^c | | 4 |
| GE CLAS Core: World Languages First Level Proficiency or elective course ^f | | 4 - 5 |
| Hours | | 16-17 |
| Spring | | |
| EES:2001 | Second-Year Field Trip for Earth and Environmental Sciences ^g | 1 |
| Major: geoscience "choose three" course ^h | | 3 - 4 |
| GE CLAS Core: Historical Perspectives ^d | | 3 |
| GE CLAS Core: Values and Society ^d | | 3 |

| | | |
|---|--|----------------|
| GE CLAS Core: World Languages Second Level Proficiency or elective course ^f | | 4 - 5 |
| Hours | | 14-16 |
| Summer | | |
| EES:2831 | Geologic Field Methods ⁱ | 3 |
| Hours | | 3 |
| Third Year | | |
| Fall | | |
| EES:3001 | Third-Year Field Trip for Earth and Environmental Sciences ^g | 1 |
| Major: geoscience "choose three" course ^h | | 3 - 4 |
| GE CLAS Core: International and Global Issues ^d | | 3 |
| GE CLAS Core: World Languages Third Level Proficiency or elective course ^f | | 4 - 5 |
| Elective course ^j | | 3 |
| Hours | | 14-16 |
| Spring | | |
| Major: geoscience "choose three" course ^h | | 3 - 4 |
| GE CLAS Core: Social Sciences ^d | | 3 |
| GE CLAS Core: World Languages Fourth Level Proficiency or elective course ^f | | 4 - 5 |
| Elective course ^j | | 3 |
| Elective course ^j | | 2 |
| Hours | | 15-17 |
| Fourth Year | | |
| Fall | | |
| EES:4001 | Fourth-Year Field Trip for Earth and Environmental Sciences ^g | 2 |
| Major: geoscience elective course prefix EES numbered 3000 or above | | 3 - 4 |
| Major: geoscience elective course prefix EES numbered 3000 or above | | 3 - 4 |
| GE CLAS Core: Literary, Visual, and Performing Arts ^d | | 3 |
| Elective course ^j | | 3 |
| Hours | | 14-16 |
| Spring | | |
| Major: geoscience elective course prefix EES numbered 3000 or above | | 3 - 4 |
| Major: geoscience elective course prefix EES numbered 3000 or above | | 3 - 4 |
| Elective course ^j | | 3 |
| Elective course ^j | | 3 |
| Elective course ^j | | 3 |
| Degree Application: apply on MyUI before deadline (typically in February for spring, September for fall) ^k | | |
| Hours | | 15-17 |
| Total Hours | | 122-137 |

a Sustainability must be completed by choosing a course that has been approved for Sustainability AND for one of these General Education areas: Natural Sciences; Quantitative and Formal Reasoning; Social Sciences; Historical Perspectives; International and Global Issues; Literary, Visual, and Performing Arts; or Values and Society.

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

c Students must complete 10 s.h. in college-level mathematics courses (may include computer science and

- statistics). Students should choose at least one course that will also complete the Quantitative or Formal Reasoning GE CLAS Core requirement.
- 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 If EES:1040 is chosen, it must be taken with the lab for 4 s.h.
- f Students who have completed four levels of a single language or two levels of two different languages in high school or college have satisfied the GE CLAS Core World Languages requirement. Students who have completed three levels of a single language may complete a fourth-level course in the same language or may choose an approved World Language and Cultural Exploration course. Enrollment in world languages courses requires a placement exam, unless enrolling in a first-semester-level course. Contact your academic advisor or CLAS Undergraduate Programs Office with questions concerning the World Languages requirement.
- g Recommended but not required to complete Geoscience BA degree requirements.
- h Choose from EES:3300, EES:3360, EES:3380, EES:3500, EES:3840, or EES:4630.
- i To complete the major, students must have field experience. They may take at least 4 s.h. of EES:1179/ EES:1180 and/or EES:3160 to satisfy this requirement. Either EES:1179/EES:1180 or EES:3160 may be repeated and/or combined to fulfill the necessary semester hours. Or they may take one semester of EES:2831 or the Iowa Lakeside Laboratory session for 3 s.h.
- 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 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 or Degree Services.