Geoscience, B.A.

Learning Outcomes

Geoscience graduates will:

• understand the structure, composition, and physical processes of the Earth;
• understand the coevolution of the Earth-Life System;
• have the ability to interpret the geologic record in the field;
• understand how to assess and utilize our natural resources in a sustainable manner; and
• develop a quantitative analytical skill set to integrate the diverse array of Earth sciences and related disciplines.

Overview

The geoscience degree offers students an extensive and comprehensive background in the Earth sciences and related scientific disciplines. Strengths of the department include environmental geology, geochemistry, geophysics, paleontology, stratigraphy, tectonics and basin analysis, surficial processes, and volcanology. Students gain extensive field experience and training and are able to integrate field and analytical research. Opportunities are provided for field experience and individual research locally, regionally, and internationally.

Requirements

The Bachelor of Arts with a major in geoscience requires a minimum of 120 s.h., including at least 55 s.h. of work for the major (at least 39 s.h. in earth and environmental sciences courses and at least 16 s.h. in supporting disciplines). 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. 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 B.A. 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. The major for the Bachelor of Arts is intended for students who are interested in the fundamentals of geology or earth science teaching (see "Teacher Licensure" below). 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 course work in economics, geography, or anthropology.

The B.A. with a major in geoscience requires the following course work.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Earth and Environmental Sciences Required Courses</td>
<td>24-28</td>
</tr>
<tr>
<td></td>
<td>Earth and Environmental Sciences Electives</td>
<td>12</td>
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<tr>
<td></td>
<td>Mathematics Courses</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Chemistry Courses</td>
<td>6-8</td>
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Earth and Environmental Sciences Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>EES:2200</td>
<td>Historical Geology</td>
<td>4</td>
</tr>
<tr>
<td>EES:2410</td>
<td>Mineralogy</td>
<td>4</td>
</tr>
<tr>
<td>EES:1030</td>
<td>Introduction to Earth Science</td>
<td>4</td>
</tr>
<tr>
<td>EES:1050</td>
<td>Introduction to Geology</td>
<td>4</td>
</tr>
<tr>
<td>EES:1040</td>
<td>Evolution and the History of Life</td>
<td>4</td>
</tr>
<tr>
<td>EES:3210</td>
<td>Principles of Paleontology</td>
<td>3</td>
</tr>
<tr>
<td>EES:3300</td>
<td>Sedimentary Geology</td>
<td>4</td>
</tr>
<tr>
<td>EES:3360</td>
<td>Soil Genesis and Geomorphology</td>
<td>3</td>
</tr>
<tr>
<td>EES:3380</td>
<td>Fluvial Geomorphology</td>
<td>3</td>
</tr>
<tr>
<td>EES:3500</td>
<td>Igneous and Metamorphic Petrology</td>
<td>4</td>
</tr>
<tr>
<td>EES:3840</td>
<td>Structural Geology</td>
<td>4</td>
</tr>
<tr>
<td>EES:4630</td>
<td>Hydrogeology</td>
<td>3</td>
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And:

Earth and environmental sciences electives numbered EES:3000 or above 12

Mathematics

Students must complete the following course work in mathematics.

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>College-level mathematics (may include computer science and statistics)</td>
<td>10</td>
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</table>

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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CHEM:1070</td>
<td>General Chemistry I-Ii</td>
<td>6</td>
</tr>
<tr>
<td>CHEM:1080</td>
<td>Principles of Chemistry I-Ii</td>
<td>8</td>
</tr>
</tbody>
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Field Requirement

To complete the major, students must have field experience. They may take at least 4 s.h. of EES:1180 Geology Field Trip: Selected National Parks and/or EES:3160 Field Trip to satisfy this requirement. Either course may be repeated and/or combined to fulfill the necessary semester hours. Or they may take one semester of EES:2831 Geologic Field Methods or the Iowa Lakeside Laboratory session.
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

Majors interested in earning licensure to teach in elementary and/or secondary schools must complete the College of Education's Teacher Education Program (TEP) in addition to the requirements for the major and all requirements for graduation. The TEP requires several College of Education courses and student teaching. Contact the Office of Student Services for details.

Students must satisfy all degree requirements and complete TEP licensure before degree conferral.

Students with a strong interest in science teaching may complete a science education major. Students choose one of five emphases—biology, chemistry, earth science, physics, or all-science—and earn a Bachelor of Science degree. They may apply for admission to the TEP. See the B.S. in science education in the Teaching and Learning section of the Catalog.

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.

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 course work; the Bachelor of Arts requires a minimum of 17 courses.

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 course work 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.

Honors in the Major

Students have the opportunity to graduate with honors in the major. Departmental honors students must maintain a cumulative g.p.a. of at least 3.33 in all University of Iowa course work and in all geoscience courses. Students must complete a senior thesis, registering in 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 g.p.a. 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 course work in geoscience. Consult the departmental honors advisor for more information.

Honors

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CHEM:1070 General Chemistry I 3
RHET:1030 or ENGL:1200 Rhetoric or The Interpretation of Literature 3 - 4

Major: math/statistics/computer science course a, b 3 - 4
CSI:1600 Success at Iowa 2

Hours 15-17

Spring

EES:2200 Historical Geology 4
CHEM:1080 General Chemistry II 3
ENGL:1200 or RHET:1030 The Interpretation of Literature or Rhetoric 3 - 4

Major: math/statistics/computer science course b 3 - 4
GE CLAS Core: Diversity and Inclusion c 3

Hours 15-17

Summer

EES:2831 Geologic Field Methods 3

Hours 3

Second Year

Fall

EES:2410 Mineralogy 4
EES:1040 or EES:3210 Evolution and the History of Life or Principles of Paleontology 4
GE CLAS Core: Historical Perspectives c 3
GE CLAS Core: World Languages First Level Proficiency or elective course e 4 - 5

Hours 15-16

Spring

Major: geoscience "choose three" course f 3 - 4
Major: math/statistics/computer science course b 4
GE CLAS Core: Values and Culture c 3
GE CLAS Core: World Languages Second Level Proficiency or elective course e 4 - 5

Hours 14-16

Third Year

Fall

Major: geoscience "choose three" course f 3 - 4
GE CLAS Core: International and Global Issues c 3
GE CLAS Core: World Languages Second Level Proficiency or elective course e 4 - 5
Elective course g 3
Elective course g 1 - 3

Hours 14-18

Spring

Major: geoscience "choose three" course f 3 - 4
GE CLAS Core: Social Sciences c 3
GE CLAS Core: World Languages Fourth Level Proficiency or elective course e 4 - 5
Elective course g 3
Elective course g 1 - 3

Hours 14-18

Fourth Year

Fall

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 c 3
Elective course g 3
Elective course g 1 - 3

Hours 13-17

Total Hours 119-140

a Fulfills a major requirement and may fulfill a GE requirement.
b 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.
c 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.
d If EES:1040 is chosen, it must be taken with the lab for 4 s.h.
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 Choose from EES:3300, EES:3360, EES:3380, EES:3500, EES:3840, or EES:4630.
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.

Career Advancement

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

Graduates are typically employed in environmental service or corporations/consultancy; local, state, and federal agencies, such as geological surveys; education; conservation agencies; urban planning; natural resource evaluation and utilization; water resource management; nonprofit organizations; resource and research institutes; and ecotourism. Companies such as ExxonMobil routinely recruit Iowa graduates on campus.

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