Geoscience, B.A.

Students majoring in geoscience take at least an academic year’s work in three allied scientific areas—physics, chemistry, and mathematics—and a semester of biology in addition to a course in each major area of geology.

Geoscience students may elect to pursue an additional major or a minor in a related discipline, usually chemistry, physics, biology, engineering, environmental sciences, or anthropology. See “Majors, Minors, and Certificates” under For Current Students on the College of Liberal Arts and Sciences website.

Requirements

The Bachelor of Arts with a major in geoscience requires a minimum of 120 s.h., including at least 51 s.h. of work for the major (at least 35 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 General Education Program. Transfer students must complete a minimum of 15 s.h. of course work 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 “B.A. with 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 General Education Program’s 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>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth and Environmental Sciences Required</td>
<td>20-24</td>
</tr>
<tr>
<td>Earth and Environmental Sciences Electives</td>
<td>12</td>
</tr>
<tr>
<td>Mathematics Courses</td>
<td>10</td>
</tr>
<tr>
<td>Chemistry Courses</td>
<td>6-8</td>
</tr>
<tr>
<td>Field Requirement</td>
<td>3-4</td>
</tr>
<tr>
<td>Total Hours</td>
<td>51-58</td>
</tr>
</tbody>
</table>

Earth and Environmental Sciences Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EES:2410</td>
<td>Mineralogy</td>
<td>4</td>
</tr>
<tr>
<td>One of these:</td>
<td></td>
<td></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>One or both of these:</td>
<td></td>
<td></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>
</tbody>
</table>

At least three of these:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<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>
</tr>
</tbody>
</table>

And:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth and environmental sciences electives</td>
<td>12</td>
</tr>
</tbody>
</table>

Mathematics

Students must complete the following course work in mathematics.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>College-level mathematics (may include computer science and statistics)</td>
<td>10</td>
</tr>
</tbody>
</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>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM:1070 &amp;</td>
<td>General Chemistry I-II</td>
<td>6</td>
</tr>
<tr>
<td>CHEM:1080</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM:1110 &amp;</td>
<td>Principles of Chemistry I-II</td>
<td>8</td>
</tr>
<tr>
<td>CHEM:1120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EES:1180 Geology Field Trip: Selected</td>
<td>2</td>
</tr>
<tr>
<td>National Parks</td>
<td></td>
</tr>
<tr>
<td>EES:2831 Geologic Field Methods</td>
<td>3</td>
</tr>
<tr>
<td>EES:3160 Field Trip</td>
<td>2</td>
</tr>
</tbody>
</table>

One natural science session at Iowa Lakeside Laboratory for a minimum of 3 s.h.

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.

B.A. with 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 Teacher Education Program 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 Teacher Education Program. See B.S. in Science Education in the Teaching and Learning section of the Catalog.

**Honors**

**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.

**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 General Education courses, and a sufficient number of semester hours to graduate

#### Sample Plan of Study

**Geoscience (B.A.)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EES:1030</td>
<td>Introduction to Earth Science (major)</td>
<td>4</td>
</tr>
<tr>
<td>CHEM:1070</td>
<td>General Chemistry I (major)</td>
<td>3</td>
</tr>
<tr>
<td>Rhet:1030</td>
<td>General Education course</td>
<td>3</td>
</tr>
<tr>
<td>Major: math/statistics/computer science course</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>CSI:1600</td>
<td>Success at Iowa</td>
<td>2</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>16-17</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EES:1040</td>
<td>Evolution and the History of Life (major)</td>
<td>4</td>
</tr>
<tr>
<td>CHEM:1080</td>
<td>General Chemistry II (major)</td>
<td>3</td>
</tr>
<tr>
<td>ENGL:1200</td>
<td>The Interpretation of Literature (GE: Interpretation of Literature )</td>
<td>3</td>
</tr>
<tr>
<td>Major: math/statistics/computer science course</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>GE: Diversity and Inclusion</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>16-17</td>
</tr>
<tr>
<td><strong>Summer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EES:2831</td>
<td>Geologic Field Methods (major)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EES:2410</td>
<td>Mineralogy (major)</td>
<td>4</td>
</tr>
<tr>
<td>Major: math/statistics/computer science course</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>GE: Historical Perspectives</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: World Languages or elective course 2</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td>Elective course 3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>15-18</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major: geoscience pick three course</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Major: math/statistics/computer science course</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>GE: Values and Culture</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: World Languages or elective course</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td>Elective course 3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>15-19</td>
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<tr>
<td><strong>Third Year</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major: geoscience elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Course Type</td>
<td>Hours</td>
<td>Notes</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>GE: International and Global Issues</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: World Languages or elective course</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td><strong>15-17</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Hours</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major: geoscience pick three course</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>GE: Social Sciences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: World Languages or elective course</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td><strong>15-18</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Fourth Year**

**Fall**

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Hours</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major: geoscience elective course</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Major: geoscience elective course</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>GE: Literary, Visual, and Performing Arts</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td><strong>15-17</strong></td>
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**Spring**

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Hours</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major: geoscience elective course</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Major: geoscience pick three course</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
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<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td><strong>12-14</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours**  **122-140**

1 General Education (GE) 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. For more information, view the General Education Program.

2 Students who have completed four years of a single language in high school have satisfied the College of Liberal Arts and Sciences GE: World Languages requirement. Enrollment in world languages courses requires a placement exam, unless enrolling in a first-semester-level course.

3 Students may use their elective courses to complete a double major, minors, or certificates.

**Career Advancement**

Career opportunities are readily available for geoscience graduates. Professional geologists work in resource companies, environmental corporations, educational institutions, conservation agencies, urban planning, state and federal geological surveys, and government resource and research organizations. Companies such as ExxonMobil routinely recruit Iowa graduates on campus.

An undergraduate degree in geoscience provides solid preparation for graduate study in law, business, environmental studies, engineering, archaeology, science education, and oceanography. Geoscience provides useful skills for all of these fields.

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