The Department of Earth Science offers the following undergraduate programs. Specific requirements for these programs are listed within this Department of Earth Science section in the following order:

- **Undergraduate Majors (B.A.)**
  - Earth Science
  - Earth Science-Teaching
  - Environmental Science

- **Minors**
  - Earth Science
  - Earth Science-Teaching

The Department of Earth Science encompasses five curricular disciplines: astronomy, meteorology, geology, earth science education and environmental science.

Major programs are offered in one baccalaureate area:

- Bachelor of Arts

The B.A. degree in Earth Science is designed as a broad liberal arts major that can build a strong foundation for a variety of career plans. It also provides supportive background and additional career options as a second major for students majoring in other disciplines such as mathematics, computer science, technology, anthropology, geography, biology, chemistry or related areas. The B.A. degree in Earth Science-Teaching is designed to prepare secondary Earth Science teachers. The B.A. degree in Environmental Science will provide students with the tools necessary to assess and evaluate environmental issues in various fields including air quality, hydrology and geoscience.

### Bachelor of Arts Degree Programs

#### Earth Science Major

The Earth Science major requires a minimum of 120 total hours to graduate. This total includes Liberal Arts Core requirements and the following specified major requirements, plus electives to complete the minimum of 120 hours.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EARTHSCI 1100 (870:010)</td>
<td>Astronomy *</td>
<td>4</td>
</tr>
<tr>
<td>EARTHSCI 1200 (870:021)</td>
<td>Elements of Weather</td>
<td>3</td>
</tr>
<tr>
<td>EARTHSCI 1300 (870:031)</td>
<td>Introduction to Geology</td>
<td>4</td>
</tr>
<tr>
<td>EARTHSCI 1320 (870:035)</td>
<td>Earth History</td>
<td>4</td>
</tr>
</tbody>
</table>

**Physics:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYSICS 1511 (880:054)</td>
<td>General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>or PHYSICS 1701 (880:130)</td>
<td>Physics I for Science and Engineering</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electives in earth science: 100-level* courses **</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>

* EARTHSCI 1100 (870:010) must be taken for four semester hours of credit.

** 100-level credits in earth science must include at least one course from each of astronomy, geology, and meteorology. In addition, at least 2 hours must be from either EARTHSCI 3410/5410 (870:137g), EARTHSCI 3179 (870:179) "Cooperative Education", EARTHSCI 4400 (870:180), EARTHSCI 3430 (870:195), or another appropriate experiential learning course approved by the student’s advisor and the department head.

^ See course section for 4-digit numbers associated with these 100-level courses.

### Earth Science Major-Teaching

The Earth Science-Teaching major requires a minimum of 120-121 total hours to graduate. This total includes Liberal Arts Core requirements, the Professional Education Requirements and the following specified major requirements, plus electives to complete the minimum of 120-121 hours.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCI ED 3300/5300 (820:190g)</td>
<td>Orientation to Science Teaching</td>
<td>3</td>
</tr>
<tr>
<td>SCI ED 4700/5700 (820:193g)</td>
<td>Methods for Teaching Physical Science</td>
<td>3</td>
</tr>
<tr>
<td>SCI ED 3200 (820:196)</td>
<td>Current Technologies in Science Teaching</td>
<td>2</td>
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</table>

**Chemistry and Biochemistry:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1110 (860:044)</td>
<td>General Chemistry I &amp; General Chemistry II</td>
<td>5-8</td>
</tr>
<tr>
<td>or CHEM 1130 (860:070)</td>
<td>General Chemistry I-II</td>
<td>5-8</td>
</tr>
</tbody>
</table>

**Earth Science:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EARTHSCI 1100 (870:010)</td>
<td>Astronomy *</td>
<td>4</td>
</tr>
<tr>
<td>EARTHSCI 1200 (870:021)</td>
<td>Elements of Weather</td>
<td>3</td>
</tr>
</tbody>
</table>
Department of Earth Science

EARTHSCI 1210 (870:022) Elements of Weather Laboratory 1
EARTHSCI 1300 (870:031) Introduction to Geology 4
EARTHSCI 1320 (870:035) Earth History 4
EARTHSCI 3210/5210 (870:121g) Meteorology 4

Electives in Earth Science: 100-level courses *,** 6

Total Hours 47-50

* EARTHSCI 1100 (870:010) must be taken for four semester hours of credit.

** Excluding the following Courses: EARTHSCI 3186/4186/5186 (870:186/870:186g) "Studies in", EARTHSCI 3420/5420 (870:189g), EARTHSCI 3430 (870:195), EARTHSCI 4198 (870:198) "Independent Study".

^ See course descriptions for 4-digit numbers associated with these 100-level courses.

Environmental Science Major

The Environmental Science major requires a minimum of 120 total hours to graduate. This total includes Liberal Arts Core requirements and the following specified major requirements, plus electives to complete the minimum of 120 hours.

The Environmental Science major is intended as a hands-on program with all students having a common curricular core centered on Geology and Meteorology, as well as Geography, Biology, Environmental Policies, Mathematics, and Chemistry. Following the common core courses students take supporting courses in areas of professional interest – Air Quality, Geoscience, or Hydrology. Each has a range of courses that provide students with experience in evaluating and responding to environmental issues.

Required

BIOL 2051 (840:051) General Biology: Organismal Diversity 4
CHEM 1110 (860:044) General Chemistry I 4
EARTHSCI 1200 (870:021) Elements of Weather 3
EARTHSCI 1300 (870:031) Introduction to Geology 4
EARTHSCI 3230/5230 (870:123g) Air Quality 4
EARTHSCI 3345/5345 (870:171g) Environmental Geology 3
EARTHSCI 3350/5350 (870:173g) Environmental Hydrology 3
EARTHSCI 3430 (870:195) Internship 2
EARTHSCI 3440 (870:180) Undergraduate Research in Earth Science 4
ENV SCI 4666/5666 (830:166g) Environmental and Occupational Health Regulations 3
GEOG 3310 (970:164) Geographic Information Systems I 3
MATH 1140 (800:046) Precalculus 4
or MATH 1420 (800:060) Calculus I
STAT 1772 (800:072) Introduction to Statistical Methods 3

Electives selected for area of professional interest 22
Total Hours 62

Minors

Earth Science Minor

Required

Courses in Earth Science 20
Total Hours 20

Earth Science Minor-Teaching

Required

Chemistry and Biochemistry:
CHEM 1110 (860:044) General Chemistry I 4

Earth Science:
EARTHSCI 1100 (870:010) Astronomy * 4
EARTHSCI 1200 (870:021) Elements of Weather 3
EARTHSCI 1210 (870:022) Elements of Weather Laboratory 1
EARTHSCI 1300 (870:031) Introduction to Geology 4
EARTHSCI 1320 (870:035) Earth History 4

Physics:
PHYSICS 1511 General Physics I (880:054) 4

Total Hours 24

* EARTHSCI 1100 (870:010) must be taken for four semester hours of credit.

Also required: a teaching major or minor in biology, chemistry, physics, or science.

Completion of this minor will satisfy the requirements of the Iowa Department of Education for Earth Science approval (effective October 1, 1988) only if the student has completed 30 semester hours in the broad area of science.