Geoscience, B.S.

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 Science with a major in geoscience requires a minimum of 120 s.h., including at least 70 s.h. of work for the major (39 s.h. in earth and environmental sciences courses and at least 31 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 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.S. with a major in geoscience requires the following course work:

- Earth and Environmental Sciences Courses 39-40
- Mathematics Courses 11-12
- Chemistry Courses 8
- Physics Courses 8
- Biology Course 4

Independent Research Option 3-4

Total Hours 70-72

Earth and Environmental Sciences

One of these:

- EES:1030 Introduction to Earth Science 4
- EES:1050 Introduction to Geology (preferred) 4

All of these:

- EES:1040 Evolution and the History of Life 4
- EES:2410 Mineralogy 4
- EES:2831 Geologic Field Methods 3
- EES:3300 Sedimentary Geology 4
- EES:3500 Igneous and Metamorphic Petrology 4
- EES:3840 Structural Geology 4
- EES:4832 Geologic Field Analysis 3

One of these:

- EES:3210 Principles of Paleontology 3
- EES:4490 Elements of Geochemistry 3

And:

At least two geoscience electives; see "Recommended Electives" below

Mathematics

One of these:

- MATH:1550 Engineering Mathematics I: Single Variable Calculus 4
- MATH:1850 Calculus I 4

One of these:

- MATH:1560 Engineering Mathematics II: Multivariable Calculus 4
- MATH:1860 Calculus II 4

And:

An additional mathematics course numbered MATH:2000 or above, or a computer science course numbered CS:1110 or above, or a statistics course numbered STAT:2010 or above

Chemistry

Students must complete at least 8 s.h. of college-level chemistry, including the following sequence or equivalent courses or more advanced courses. Chemistry courses numbered below CHEM:1110 Principles of Chemistry I do not count toward this requirement.

CHEM:1110 & CHEM:1120 Principles of Chemistry I-II 8

Physics

Students must complete at least 8 s.h. of college-level physics, as follows. Physics courses numbered below PHYS:1511 College Physics I do not count toward this requirement.

PHYS:1511 PHYS:1512 College Physics I-II 8

PHYS:1611 PHYS:1612 Introductory Physics I-II 8

Biology

Students must complete at least one biology course that includes a laboratory (4 s.h.). Students with an interest in paleontology are encouraged to take BIOL:1411 Foundations of Biology and BIOL:1412 Diversity of Form and Function.

One biology course (includes a lab) 4

Recommended Electives

All students should take elective courses from the following groups in order to broaden their undergraduate experience and prepare themselves for graduate study or professional employment. Students who have clear career goals are advised to take three or more elective courses from the group that fits their needs most closely. Students also may seek a broad education in geoscience by choosing elective courses from a number of groups.

Quaternary Geology

- EES:3020 Earth Surface Processes 3
EES:3100 Introduction to Applied Remote Sensing 4
EES:3360 Soil Genesis and Geomorphology 3
EES:3380 Fluvial Geomorphology 3
EES:4490 Elements of Geochemistry 3
EES:4520 Isotope Geochemistry 3
EES:4620 Approaches to Geoaechaeology 3
EES:4630 Hydrogeology 3
EES:4720 Glacial and Pleistocene Geology 3
EES:4790 Engineering Geology 3
EES:4870 Applied Geostatistics 3

Environmental Geology
EES:1400 Natural Disasters 3
EES:3070 Marine Ecosystems and Conservation 3
EES:3080 Introduction to Oceanography 2
EES:3100 Introduction to Applied Remote Sensing 4
EES:3380 Fluvial Geomorphology 3
EES:3390 Integrated Watershed Analysis 3
EES:4490 Elements of Geochemistry 3
EES:4520 Isotope Geochemistry 3
EES:4630 Hydrogeology 3
EES:4680 Field Methods in Hydrologic Science 3
EES:4790 Engineering Geology 3
EES:4800 Solid Earth Geophysics 3
EES:4870 Applied Geostatistics 3

Geochemistry
EES:3410 Analytical Methods 2
EES:4490 Elements of Geochemistry 3
EES:4520 Isotope Geochemistry 3
EES:4630 Hydrogeology 3
EES:4870 Applied Geostatistics 3
EES:5820 Tectonics 3

Tectonics/Petrology
EES:1400 Natural Disasters 3
EES:3410 Analytical Methods 2
EES:4490 Elements of Geochemistry 3
EES:4520 Isotope Geochemistry 3
EES:4630 Hydrogeology 3
EES:4870 Applied Geostatistics 3
EES:5820 Tectonics 3

Sedimentary Geology
EES:3080 Introduction to Oceanography 2
EES:3300 Sedimentary Geology 4
EES:3380 Fluvial Geomorphology 3
EES:3770 Global Stratigraphy 3

Paleobiology
EES:3070 Marine Ecosystems and Conservation 3
EES:3080 Introduction to Oceanography 2
EES:3210 Principles of Paleontology 3
EES:3220 Evolution of the Vertebrates 3
EES:3300 Sedimentary Geology 4
EES:3770 Global Stratigraphy 3
EES:4420 Vertebrate Osteology and Phylogeny 3
EES:4440 Phyllogenetics and Biodiversity 3
EES:4450 Morphometrics 1-3
EES:4490 Elements of Geochemistry 3
EES:4520 Isotope Geochemistry 3
EES:4700 Evolution of Ecosystems 3
EES:4710 Evolution of Plants 3
EES:5820 Tectonics 3

Independent Research Option
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 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.S. 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. 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 Science requires a minimum of 19 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.S.)

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<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>Fall</td>
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<td>EES:1050</td>
<td>Introduction to Geology (major)</td>
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<td>Principles of Chemistry I (major)</td>
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<td>Calculus I (major)</td>
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<td>Rhetoric (GE: Rhetoric or other</td>
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Elective course 1

Spring
Major: geoscience pick one course 3
Elective course 3
Elective course 3
Elective course 3
Elective course 3

Hours 15

Total Hours 129-142

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

The major is designed to prepare students for immediate employment after graduation or to enter a graduate program in geology. 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.