



The Department of Earth and Environmental Sciences

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The Department of Earth and Environmental Sciences offers six programs of study.

The Bachelor of Science in Geology has three options:

- 1. The Professional Option** is for those who plan to enter the profession or go to graduate school but are uncertain where they want to concentrate. The program emphasizes breadth and exposes students to most of the geological disciplines.
- 2. The Environmental Option** emphasizes the application of Earth Science to environmental problems associated with the hydrosphere, atmosphere, and natural hazards.
- 3. The Engineering Geology Option** is for those interested in combining Geology with a Civil Engineering minor to work with engineering firms on construction and environmental problems.

The Bachelor of Arts in Geology has two options:

- 1. The Geographic Information Systems Option** is for those who want to combine Geology with computer technology to store and analyze spatial data using the GIS software.
- 2. General and Teacher Certification Option** is for those who want teacher certification in Earth/Life Sciences or in Earth Science as well as those who want to combine Geology with other professional interests.

Certification in Geographic Information Systems is designed for those in other majors who want to become proficient in spatial data analysis, which is used in business, liberal arts, engineering and architecture disciplines.

Requirements for a Bachelor of Science Degree in Geology

The University's core curriculum, required for all bachelor's degrees, is explained under Degree Program Requirements in this catalog. In addition to the core curriculum, the requirements for each option are listed below.

Professional Option

Geology Requirements for the Major

1425 (Earth Systems)
1426 (Earth History)
2445 (Mineralogy)
2446 (Petrology)
3441 (Paleontology)
3442 (Sedimentology)
3443 (Structure)
3387 & 3388 (Field Geology)
4331 (Analysis of Spatial Data) or MATH 3316 (Statistical Inference) 4302, 4308, 4320 or 4402
Six hours of 4000 level courses approved by the advisor. No more than 3 hours may be from
GEOL 4330, 4331, 4332, 4333, 4334.

Requirements for the Minor

18 hours in Biology, Chemistry, Mathematics, Physics, or Computer Science. Six hours must be upper division (3000/4000) courses approved by the advisor. A double minor requires 36 hours in any two of the aforementioned departments.

Natural Science other than Geology

A year of Biology, Chemistry, and Physics that includes BIOL 1441 and 1442; CHEM 1441 and 1442; PHYS 1441 or 1443, and 1442 or 1444.

Mathematics

1426 (Calculus I) and 2425 (Calculus II). The Math Department requires a placement exam before enrolling in Calculus I. Depending on the results of the placement exam, student may be required to take one or more of the following: College Algebra, Trigonometry, and Pre-calculus.

Computer Literacy

GEOL 1391 or equivalent.

Oral Communication

COMM 3302 (also satisfies Liberal Arts elective) or pass oral presentation requirement in GEOL 3441 or 3443.

General Requirements

The University requires at least 120 total credit hours, of which 36 must be upper division hours.

Environmental Science Option

Geology Requirements for the Major

1425 (Earth Systems)
1426 (Earth History) or 2411 (Global Environmental Issues)
2445 (Mineralogy)
2446 (Petrology)
3305 and 3185 or 4405 (Meteorology)
3442 (Sedimentology)
3443 (Structure)
3387 and 3388 (Field Geology)
4308 (Environmental Geochemistry)
4320 (Hydrology)
4330 (Geographic Information Systems)
4331 (Analysis of Spatial Data) or MATH 3316 (Statistical Inference)

Requirements for the Minor

18 hours in Biology, Chemistry, or Civil Engineering. Six hours must be upper division (3000/4000) courses approved by the advisor. A double minor requires 36 hours in any two of the aforementioned departments.

Natural Science other than Geology

A year of Biology, Chemistry, and Physics that includes BIOL 1441 and 1442; CHEM 1441 and 1442; PHYS 1441 and 1442.

Mathematics

1426 (Calculus I) and 2425 (Calculus II) or 3316 (Statistics). The Math Department requires a placement exam before enrolling in Calculus I. Depending on the results of the placement exam, students may be required to take one or more of the following: College Algebra, Trigonometry, and Precalculus.

Computer Literacy

GEOL 1391 or equivalent.

Oral Communication

COMM 3302 (also satisfies Liberal Arts elective) or pass oral presentation requirement in GEOL 3441 or 3443.

General Requirements

The University requires at least 120 total credit hours, of which 36 must be upper division hours.

Engineering Geology Option



Geology Requirements for the Major

1425 (Earth Systems)
1426 (Earth History)
2445 (Mineralogy)
2446 (Petrology)
3442 (Sedimentology)
3443 (Structure)
3387 and 3388 (Field Geology)
4308 (Environmental Geochemistry)
4320 (Hydrology)
4330 (Geographic Information Systems)

19 hours of advisor-approved Civil Engineering courses including 2312 (Statics and Dynamics), 3305 (Fluids), and 3311 (Materials). Six hours must be upper division (3000/4000) courses.

No minor is required for this option.

Natural Science other than Geology

A year of Chemistry and Physics that includes CHEM 1441 and 1442; PHYS 1443 and 1444.

Mathematics

1426 (Calculus I) and 2425 (Calculus II). The Math Department requires a placement exam before enrolling in Calculus I. Depending on the results of the placement exam, students may be required to take one or more of the following: College Algebra, Trigonometry, and Precalculus.

Computer Literacy

GEOL 1391 or equivalent.

Oral Communication

COMM 3302 (also satisfies Liberal Arts elective) or pass oral presentation requirement in GEOL 3441 or 3443.

General Requirements

The University requires at least 120 total credit hours, of which 36 must be upper division hours.

Typical Course Sequence

(For students who are well-prepared for college level work at the time of admission, and who can devote 50-60 hours per week to study. All students are expected to see their academic advisor prior to enrollment each term.)

Freshman Year

First Semester: ENGL 1301; MATH 1325; GEOL 1425, 1391; HIST 1311 - 16 hours.

Second Semester: ENGL 1302; MATH 1426; CHEM 1441; GEOL 1426; HIST 1312 - 17 hours.

Sophomore Year

First Semester: English (literature), 3 hours; MATH 2425; CHEM 1442; GEOL 2445 - 14 hours.

Second Semester: BIOL 1441; POLS 2311; GEOL 2446; Social Science, 3 hours - 14 hours.

Junior Year

First Semester: PHYS 1441 or 1443; GEOL 3441 and 4331 or MMATH 3316; POLS 2312 - 14 hours.

Second Semester: GEOL 3442 and 3443; PHYS 1442 or 1444; BIOL 1442 - 16 hours.

Summer Session

GEOL 3387 and 3388 (Summer Field Course) 6 hours.

Senior Year

First Semester: Minor, 6 hours; Geology (elective), 3 hours; Fine Arts, 3 hours; Other Social Science or Fine Arts, 3 hours - 15 hours.

Second Semester: Minor, 6 hours; Geology Electives, 6 hours; Free Electives, 3 hours - 15 hours.

Requirements for a Bachelor of Arts Degree in Geology

The University's core curriculum, required for all bachelor's degrees, is explained under Degree Program Requirements in this catalog. In addition to the core curriculum, the major requirements are listed below.

General and Teacher Certification Option

Additional requirements for teacher certification are explained in the section for the College of Education.

Geology Requirements for the Major

1425 (Earth Systems)
1426 (Earth History)
2445 (Mineralogy)
2446 (Petrology)
3441 (Paleontology)
3442 (Sedimentology)
3443 (Structure)
MATH 1308 or MATH 3316

Six hours of advisor-approved 3000 and/or 4000 level courses.

Three hours of an advisor-approved 4000 level course.

Requirements for the Minor

18 hours in a single department of which six must be upper division.

Natural Science other than Geology

A year of Biology, Chemistry, and Physics that includes BIOL 1441 and 1442; CHEM 1441 and 1442; PHYS 1441 and 1442.

Mathematics

1324 (or 1302 and 1303), and 1308 or 3316.

Computer Literacy

GEOL 1391 or equivalent.

Oral Communication

COMM 3302 (also satisfies Liberal Arts elective) or pass oral presentation requirement in GEOL 3441 or 3443.

General Requirements

The University requires at least 120 total credit hours, of which 36 must be upper division hours.

Geographic Information Systems Option

Geology Requirements for the Major

1425 (Earth Systems)
1426 (Earth History) or 2406 (Geologic Time)
2445 (Mineralogy)
2446 (Petrology)
3441 (Paleontology)
3442 (Sedimentology)
3443 (Structure)
4330 (Understanding GIS)
4331 (Analysis of Spatial Data)
4333 (Remote Sensing)
4334 (GIS Project)

Requirements for the Minor

18 hours of advisor-approved courses in a single department.

Natural Science other than Geology

A year of Biology, Chemistry, and Physics that includes BIOL 1441 and 1442; CHEM 1441 and 1442; PHYS 1441 and 1442.

Mathematics

1324 (or 1302 and 1303), and 1308 or 3316.

Computer Literacy

GEOL 1391 or equivalent.

Oral Communication

COMM 3302 (also satisfies Liberal Arts elective) or pass oral presentation requirement in GEOL 3441 or 3443.

General Requirements

The University requires at least 120 total credit hours, of which 36 must be upper division hours.

Typical Course Sequence

(For students who are well-prepared for college level work at the time of admission, and who can devote 50-60 hours per week to study. All students are expected to see their academic advisor prior to enrollment each term.)

Freshman Year

First Semester: ENGL 1301; MATH 1324; GEOL 1425, 1391; HIST 1311 - 16 hours.

Second Semester: ENGL 1302; GEOL 1426; CHEM 1441; HIST 1312; POLS 2311 - 17 hours.

Sophomore Year

First Semester: English (literature), 3 hours; CHEM 1442; GEOL 4330; GEOL 2445; POLS 2312 - 17 hours.

Second Semester: Social Science, 3 hours; GEOL 4331; BIOL 1441; GEOL 2446 - 15 hours.

Junior Year

First Semester: GEOL 4333; GEOL 3441; MATH 3316; PHYS 1441; Minor, 3 hours - 17 hours.

Second Semester: GEOL 3442; GEOL 3443; Minor, 3 hours; PHYS 1442 - 15 hours.

Senior Year

First Semester: Minor, 6 hours; GEOL 4334; Geology Elective, 3 hours; Fine Arts, 3 hours - 15 hours.

Second Semester: Minor (3000/4000), 6 hours; Geology Elective, 3 hours; Liberal Arts Elective, 3 hours - 12 hours.

Requirements for Certification in Geographic Information Systems

This is a certification program and does not lead to a bachelor's degree. However, students can use these courses as a minor in their bachelor's degree program or as part of the B.A. in Geology degree program.

Geology Requirements

4330 (Understanding Geographic Information Systems)

4331 (Analysis of Spatial Data)

4333 (Analysis of Remotely Sensed Data)

4334 (Geographic Data Analysis Project)

Earth and Environmental Sciences Faculty

Chair



Professor Wickham

Professors

Holbrook, M. Nestell, Scotese

Assistant Professors

Hu, Hunt, Rowe, Winguth

Adjunct Professors

Damuth, Kotila, Lowell, G. Nestell, Shanmugam, C. Winguth

Adjunct Associate Professors

Deaton, Eisenstadt, Standlee

Lecturer

Mergele, Jackson

Professors Emeritus

Burkart, Balsam Ellwood, McNulty, Reaser, Smith