Most geoscience concepts are best understood by leaving the classroom and spending time studying the rocks and geologic features where they exist. Field trips off-campus provide students field experiences, enabling them to experience geologic features first hand.

The unique location of BYU-Idaho offers an exceptional opportunity to study geology, visiting some of the most famous geologic localities in the world. Local and regional field trips to Yellowstone and Grand Teton National Parks, Snake River Plain volcanic and hydrologic features, Hells Canyon and Borah Peak earthquake localities, and the Grand Canyon in Arizona, provide for more effective learning, enhanced student understanding of geologic processes, and superior preparation for future careers.

Study of Geology offers the non-science major an opportunity to fill Physical Science General Education requirements and gain a better understanding of their natural environment. Students must achieve a minimum grade of “C-” on all required courses.

Natural Science Field Expedition
The Intermountain West is the outdoor classroom for Field Expedition which is taught during the second half of summer term. This program offers students an experiential approach to the study of Geology, Biology, Religion, and other courses as available. Since these are the only classes taken during that half of the term, most of the time is spent in the field away from the BYU-Idaho campus. This program is required for all Earth Science education majors and minors.

Field trip fee is $950. Applicants must be accepted by BYU-Idaho before entering this program. For information visit our website accessible from the home page of the Department of Geology at http://www.byui.edu/geology/ or contact Dan Moore (moored@byui.edu), telephone (208) 496-1902 or Mark Lovell (Lovellm@byui.edu), telephone (208) 496-1910.

Introduction
Geology offers students career opportunities both as professional geologists and as teachers in secondary education (Earth Science). Both career paths are currently in high demand. Graduates in Earth Science are employable with their bachelor’s degree while the professional geologist’s track generally requires a graduate degree. The current financial rewards for geologists are significant and generally require living close to a major city. The education major provides greater flexibility in choosing where to live. In addition to our major programs, we are also home for a minor in geology and education minors in Earth Science and Natural Science. The education Natural Science option is especially attractive for individuals planning to teach in smaller school districts. Within the State of Idaho, upon successful completion of required exams the candidate is able to teach all science categories.

Career opportunities for geologists include mineral or energy exploration and development, geological engineering, geophysics, environmental geology, water resources, computer applications to geology including GIS, paleontology, etc. Likely employers include energy companies, geophysical firms, local and federal government agencies, and academic institutions. The broad multidisciplinary background of a major in geology is great preparation for careers in business, law, or many other fields.

Most geoscience concepts are best understood by leaving the classroom and spending time studying the rocks and geologic features where they exist. Field trips off-campus provides students field experiences, enabling them to experience geologic features first hand.

The unique location of BYU-Idaho offers an exceptional opportunity to study geology, visiting some of the most famous geologic localities in the world. Local and regional field trips to Yellowstone and Grand Teton National Parks, Snake River Plain volcanic and hydrologic features, Hells Canyon and Borah Peak earthquake localities, and the Grand Canyon in Arizona, provide for more effective learning, enhanced student understanding of geologic processes, and superior preparation for future careers.

Study of Geology offers the non-science major an opportunity to fill Physical Science General Education requirements and gain a better understanding of their natural environment. Students must achieve a minimum grade of “C-” on all required courses.

Natural Science Field Expedition
The Intermountain West is the outdoor classroom for Field Expedition which is taught during the second half of summer term. This program offers students an experiential approach to the study of Geology, Biology, Religion, and other courses as available. Since these are the only classes taken during that half of the term, most of the time is spent in the field away from the BYU-Idaho campus. This program is required for all Earth Science education majors and minors.

Field trip fee is $950. Applicants must be accepted by BYU-Idaho before entering this program. For information visit our website accessible from the home page of the Department of Geology at http://www.byui.edu/geology/ or contact Dan Moore (moored@byui.edu), telephone (208) 496-1902 or Mark Lovell (Lovellm@byui.edu), telephone (208) 496-1910. Mailing address for both instructors in Geology Department, BYU-Idaho, Rexburg, ID 83460-0510.

http://www.byui.edu/Geology/
### BS in Geology

#### General Education Requirements

<table>
<thead>
<tr>
<th>Area</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts</td>
<td>GEOL 412</td>
<td><em>Geology</em></td>
<td>3</td>
</tr>
<tr>
<td>Arts</td>
<td>GEOL 440</td>
<td><em>Mathematics</em></td>
<td>3</td>
</tr>
<tr>
<td>Arts</td>
<td>RUSS 340</td>
<td><em>Russian</em></td>
<td>3</td>
</tr>
<tr>
<td>Arts</td>
<td>HUM 315</td>
<td><em>History</em></td>
<td>3</td>
</tr>
<tr>
<td>Math</td>
<td>MATH 111</td>
<td><em>Calculus I</em></td>
<td>3</td>
</tr>
<tr>
<td>Math</td>
<td>MATH 110</td>
<td><em>Calculus II</em></td>
<td>3</td>
</tr>
<tr>
<td>Math</td>
<td>HUM 315</td>
<td><em>History</em></td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>ENG 111</td>
<td><em>English Composition I</em></td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>ENG 251</td>
<td><em>English Composition II</em></td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>ENG 102</td>
<td><em>English Composition I</em></td>
<td>3</td>
</tr>
</tbody>
</table>

#### Major Requirements

<table>
<thead>
<tr>
<th>Area</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geology</td>
<td>GEOL 111</td>
<td><em>Physical Geology</em></td>
<td>4</td>
</tr>
<tr>
<td>Geology</td>
<td>GEOL 112</td>
<td><em>Physical Geology Lab</em></td>
<td>1</td>
</tr>
<tr>
<td>Geology</td>
<td>GEOL 310</td>
<td><em>Geology</em></td>
<td>4</td>
</tr>
<tr>
<td>Geology</td>
<td>GEOL 404</td>
<td><em>Geology</em></td>
<td>4</td>
</tr>
<tr>
<td>Geology</td>
<td>GEOL 450</td>
<td><em>Geology</em></td>
<td>3</td>
</tr>
</tbody>
</table>

#### Total GE Credits: 43

#### Total Major Credits: 45

This major also requires a minor or 2 clusters.

---

### BS in Geology

#### General Education Requirements

<table>
<thead>
<tr>
<th>Area</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts</td>
<td>GEOL 412</td>
<td><em>Geology</em></td>
<td>3</td>
</tr>
<tr>
<td>Arts</td>
<td>GEOL 440</td>
<td><em>Mathematics</em></td>
<td>3</td>
</tr>
<tr>
<td>Arts</td>
<td>RUSS 340</td>
<td><em>Russian</em></td>
<td>3</td>
</tr>
<tr>
<td>Arts</td>
<td>HUM 315</td>
<td><em>History</em></td>
<td>3</td>
</tr>
<tr>
<td>Math</td>
<td>MATH 111</td>
<td><em>Calculus I</em></td>
<td>3</td>
</tr>
<tr>
<td>Math</td>
<td>MATH 110</td>
<td><em>Calculus II</em></td>
<td>3</td>
</tr>
<tr>
<td>Math</td>
<td>HUM 315</td>
<td><em>History</em></td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>ENG 111</td>
<td><em>English Composition I</em></td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>ENG 251</td>
<td><em>English Composition II</em></td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>ENG 102</td>
<td><em>English Composition I</em></td>
<td>3</td>
</tr>
</tbody>
</table>

#### Major Requirements

<table>
<thead>
<tr>
<th>Area</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geology</td>
<td>GEOL 111</td>
<td><em>Physical Geology</em></td>
<td>4</td>
</tr>
<tr>
<td>Geology</td>
<td>GEOL 112</td>
<td><em>Physical Geology Lab</em></td>
<td>1</td>
</tr>
<tr>
<td>Geology</td>
<td>GEOL 310</td>
<td><em>Geology</em></td>
<td>4</td>
</tr>
<tr>
<td>Geology</td>
<td>GEOL 404</td>
<td><em>Geology</em></td>
<td>4</td>
</tr>
<tr>
<td>Geology</td>
<td>GEOL 450</td>
<td><em>Geology</em></td>
<td>3</td>
</tr>
</tbody>
</table>

#### Total GE Credits: 43

#### Total Major Credits: 45

This major also requires a minor or 2 clusters.
## BS in Earth Science Education

### General Education Requirements

<table>
<thead>
<tr>
<th>Take one course</th>
<th>Take one course</th>
<th>Take one course</th>
<th>Take one course</th>
<th>Religion Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 111 3</td>
<td>ART 101 3</td>
<td>ENGL 105 4</td>
<td>REL 120 2</td>
<td></td>
</tr>
<tr>
<td>MATH 130 3</td>
<td>SPAN 101 4</td>
<td>MATH 140 4</td>
<td>REL 120 2</td>
<td></td>
</tr>
<tr>
<td>ART 110 3</td>
<td>SPAN 150 4</td>
<td>MATH 140 4</td>
<td>REL 120 2</td>
<td></td>
</tr>
</tbody>
</table>

### Major Requirements

No Double Counting of Major Courses

<table>
<thead>
<tr>
<th>Education Core:</th>
<th>Take one course:</th>
<th>Program Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ENGL 101 3</td>
<td></td>
</tr>
</tbody>
</table>

Total Major Credits: 32

### Education Core Credits: 22

Education Majors Require an Education Minor for Graduation

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Major Credits: 32

### Education Majors Require an Education Minor for Graduation

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Major Credits: 32
### Geology Minor

**Take these courses:**
- GEOL 111L 1
- GEOL 112 3
- GEOL 112L 1
- GEOL 308 4
- GEOL 380 4
- GEOL 390 1-3
- GEOL 404 3
- GEOL 411 3
- GEOL 412 3
- GEOL 101 3
- GEOL 104 3
- GEOL 111 3
- GEOL 420 3
- GEOL 435 3
- GEOL 440 3
- GEOL 445 3
- GEOL 480 3
- GEOL 250 4
- GEOL 350 4
- GEOL 407 4
- GEOL 457 4
- GEOL 458 4

**Program Notes:**
- Take 3 courses
- Take 1 course
- Fall-Winter---- YES Winter-Summer---- NO Summer-Fall---- YES

**Total Minor Credits=23**

**Take these courses:**
- BIO 204 4
- BIO 208 4
- CHEM 105 4
- CHEM 106 4
- GEOL 111 3
- GEOL 111L 1
- GEOL 112 3
- GEOL 112L 1
- PH 105 3
- PH 106 3
- PH 105L 1
- PH 106L 1
- PH 105L 1
- PH 106L 1

**Program Notes:**
- Fall-Winter---- YES Winter-Summer---- YES Summer-Fall---- YES

**Total Minor Credits=32**

**Take these courses:**
- GEOL 111 3
- GEOL 111L 1
- GEOL 112 3
- GEOL 112L 1
- GEOL 250 4
- GEOL 137 3
- GEOL 137L 1
- PH 127 3
- PH 127L 1
- SHI 195L 1
- SHI 196L 1
- SHI 1105L 1

**Program Notes:**
- Fall-Winter---- YES Winter-Summer---- YES Summer-Fall---- YES

**Total Minor Credits=20**

### Minor in Earth Science Education

**Take these courses:**
- GEOL 111 3
- GEOL 111L 1
- GEOL 112 3
- GEOL 112L 1
- GEOL 172 4
- GEOL 177 3
- GEOL 177L 1
- SHI 127 2
- SHI 127L 1

**Program Notes:**
- This minor is available on the following tracks:
- Fall-Winter---- YES Winter-Summer---- YES Summer-Fall---- YES

**Total Minor Credits=20**

### Minor in Natural Science Education

**Take these courses:**
- BIO 204 4
- BIO 208 4
- CHEM 105 4
- CHEM 106 4
- GEOL 111 3
- GEOL 111L 1
- GEOL 112 3
- GEOL 112L 1
- PH 105 3
- PH 106 3
- PH 105L 1
- PH 106L 1

**Program Notes:**
- Fall-Winter---- YES Winter-Summer---- YES Summer-Fall---- YES

**Total Minor Credits=32**

### Minor in Earth Science Education

**Take these courses:**
- GEOL 111 3
- GEOL 111L 1
- GEOL 112 3
- GEOL 112L 1
- GEOL 250 4
- GEOL 137 3
- GEOL 137L 1
- PH 127 3
- PH 127L 1
- SHI 195L 1
- SHI 196L 1
- SHI 1105L 1

**Program Notes:**
- This minor is available on the following tracks:
- Fall-Winter---- YES Winter-Summer---- YES Summer-Fall---- YES

**Total Minor Credits=20**

### Minor in Natural Science Education

**Take these courses:**
- BIO 204 4
- BIO 208 4
- CHEM 105 4
- CHEM 106 4
- GEOL 111 3
- GEOL 111L 1
- GEOL 112 3
- GEOL 112L 1
- PH 105 3
- PH 106 3
- PH 105L 1
- PH 106L 1

**Program Notes:**
- Fall-Winter---- YES Winter-Summer---- YES Summer-Fall---- YES

**Total Minor Credits=32**

### Minor in Earth Science Education

**Take these courses:**
- GEOL 111 3
- GEOL 111L 1
- GEOL 112 3
- GEOL 112L 1
- GEOL 250 4
- GEOL 137 3
- GEOL 137L 1
- PH 127 3
- PH 127L 1
- SHI 195L 1
- SHI 196L 1
- SHI 1105L 1

**Program Notes:**
- This minor is available on the following tracks:
- Fall-Winter---- YES Winter-Summer---- YES Summer-Fall---- YES

**Total Minor Credits=20**

### Minor in Natural Science Education

**Take these courses:**
- BIO 204 4
- BIO 208 4
- CHEM 105 4
- CHEM 106 4
- GEOL 111 3
- GEOL 111L 1
- GEOL 112 3
- GEOL 112L 1
- PH 105 3
- PH 106 3
- PH 105L 1
- PH 106L 1

**Program Notes:**
- Fall-Winter---- YES Winter-Summer---- YES Summer-Fall---- YES

**Total Minor Credits=32**

### Minor in Earth Science Education

**Take these courses:**
- GEOL 111 3
- GEOL 111L 1
- GEOL 112 3
- GEOL 112L 1
- GEOL 250 4
- GEOL 137 3
- GEOL 137L 1
- PH 127 3
- PH 127L 1
- SHI 195L 1
- SHI 196L 1
- SHI 1105L 1

**Program Notes:**
- This minor is available on the following tracks:
- Fall-Winter---- YES Winter-Summer---- YES Summer-Fall---- YES

**Total Minor Credits=20**
Course Descriptions

GEOL 110 Introduction to Geology (3:0:0)
Fullfills GL: Physical Science requirement. General non-technical course for the non-science student who desires a broad introduction to Geology. Students should only take Geol 102 Lab. Students who take Geology 101 may not also receive credit for Geology 111. This class is also taught as part of the off-campus Discovery and Natural Science Field Expedition programs. Contact the directors of these programs for fees and other information. (Fall, Winter, Summer)

GEOL 111 Physical Geology (3:0:0)
Fullfills GL: Physical Science requirement. For majors in Geology, Engineering, Forestry, Construction and other programs. Includes a study of our earth and the processes that formed its features. Students who take Geology 111 must register for Geology 111L. Students who take Geology 111 may not receive credit for Geology 101 or Geology 104. (Fall, Winter, Summer)

GEOL 111L Physical Geology Lab (1:0:2)
Fullfills GL: Physical Science requirement. Prerequisite: Concurrent enrollment in Geol 111 or instructors’ consent. Fee: $25.00
Mineral and rock identification and interpretation, as well as, map and photo interpretation. Students who take Geology 111 lab may not receive credit for Geology 111L. (Fall, Winter, Summer)

GEOL 112 Historical Geology (3:0:0)
Prerequisite: Geol 111, 110, 111, or 112. A study of the geological history of the earth and the evolution of its life forms. For geology and related majors. Students who take Geol 112 may not receive credit for Geol 110. Students taking Geol 112 are required to take Geol 112L. (Fall, Winter)

GEOL 112L Historical Geology Lab (1:0:2)
Fee: $25.00
Prerequisite: Concurrent enrollment in Geol 112. Two-hour lecture/lab per week. Examination of the principles of historical geology, along with the study of fossils, special attention given to identification, type of preservation and environments of fossils. Geologic map studies are included. (Fall, Winter)

GEOL 113 Oceanography and Meteorology (3:0:0)
Fullfills GL: Physical Science requirement. For the non-science majors emphasizing physical geology related to geologic hazards, mineral and energy resources, and the environmental consequences of urban and rural development. Associated lab for this class is Geol 103. Students who take Geol 103 may not receive credit for Geol 113. (Fall, Winter, Summer)

GEOL 113L Oceanography & Meteorology Laboratory (1:0:2)
Fullfills GL: Physical Science requirement. Fee: $5.00
Prerequisite: Must also take Geol 113 Lab. An introductory study of oceanography and meteorology including major features of oceans (topography, chemistry, geologic history, waves, tides, currents, environmental diversity, etc.), weather, climate, methods of weather forecasting and the environmental impact of man. (Fall, Winter)

GEOL 115 Earth Science (3:0:0)
Fullfills GL: Physical Science requirement. Prerequisite: Concurrent enrollment in Geology 110L. This course is designed to enhance the student’s understanding of their natural environment and how to relate it to their lives. It will cover basic concepts and methods used in geology, astronomy and meteorology. It helps prepare Education majors with the knowledge necessary to teach these concepts in the classroom. (Fall, Winter)

GEOL 116 Earth Science Lab (1:0:2)
Fee: $7.00
Prerequisite: Must have taken Geol 110, concurrent enrollment in Geol 110 or instructor approval. Lab studies and field trips emphasize rock, mineral, and fossil classification and interpretation; map and photo interpretation; as well as weather and astronomical observation and interpretation. Emphasis on learning and teaching directed towards elementary education majors. (Fall, Winter)

GEOL 111 Physical Geology (3:0:0)
Fullfills GL: Physical Science requirement. For majors in Geology, Engineering, Forestry, Construction and other programs. Includes a study of our earth and the processes that formed its features. Students who take Geology 111 must register for Geology 111L. Students who take Geology 111 may not receive credit for Geology 101 or Geology 104. (Fall, Winter, Summer)

GEOL 111L Physical Geology Lab (1:0:2)
Fullfills GL: Physical Science requirement. Prerequisite: Concurrent enrollment in or previous completion of Geol 101 or 104. Fee: $35.00
Prerequisite: Concurrent enrollment in Geol 111 or instructors’ consent. General non-technical course for the non-science student who desires a broad introduction to Geology. Students should only take Geol 102 Lab. Students who take Geology 101 may not also receive credit for Geology 111. This class is also taught as part of the off-campus Discovery and Natural Science Field Expedition programs. Contact the directors of these programs for fees and other information. (Fall, Winter, Summer)

GEOL 112 Historical Geology (3:0:0)
Prerequisite: Geol 111, 110, 111, or 112. A study of the geological history of the earth and the evolution of its life forms. For geology and related majors. Students who take Geol 112 may not receive credit for Geol 101. Students taking Geol 112 are required to take Geol 112L. (Fall, Winter)

GEOL 112L Historical Geology Lab (1:0:2)
Fee: $25.00
Prerequisite: Concurrent enrollment in Geol 112. Two-hour lecture/lab per week. Examination of the principles of historical geology, along with the study of fossils, special attention given to identification, type of preservation and environments of fossils. Geologic map studies are included. (Fall, Winter)

GEOL 113 Oceanography and Meteorology (3:0:0)
Fullfills GL: Physical Science requirement. For the non-science majors emphasizing physical geology related to geologic hazards, mineral and energy resources, and the environmental consequences of urban and rural development. Associated lab for this class is Geol 103. Students who take Geol 103 may not receive credit for Geol 113. (Fall, Winter, Summer)

GEOL 113L Oceanography & Meteorology Laboratory (1:0:2)
Fullfills GL: Physical Science requirement. Fee: $5.00
Prerequisite: Must also take Geol 113 Lab. An introductory study of oceanography and meteorology including major features of oceans (topography, chemistry, geologic history, waves, tides, currents, environmental diversity, etc.), weather, climate, methods of weather forecasting and the environmental impact of man. (Fall, Winter)

GEOL 115 Earth Science (3:0:0)
Fullfills GL: Physical Science requirement. Prerequisite: Concurrent enrollment in Geology 110L. This course is designed to enhance the student’s understanding of their natural environment and how to relate it to their lives. It will cover basic concepts and methods used in geology, astronomy and meteorology. It helps prepare Education majors with the knowledge necessary to teach these concepts in the classroom. (Fall, Winter)

GEOL 116 Earth Science Lab (1:0:2)
Fee: $7.00
Prerequisite: Must have taken Geol 110, concurrent enrollment in Geol 110 or instructor approval. Lab studies and field trips emphasize rock, mineral, and fossil classification and interpretation; map and photo interpretation; as well as weather and astronomical observation and interpretation. Emphasis on learning and teaching directed towards elementary education majors. (Fall, Winter)
**GEOL 250 Rocks and Minerals**
Fee: $650.00
Prerequisite: Geol 101 & 102, or Geol 104 & 102 or Geol 110 & 110L, or Geol 111 & 111L or Instructor's consent.
Hand specimen study of common rocks and minerals, including their identification, classification, and interpretation. Recommended for Earth Science Secondary Education majors, and Geology Majors as well as, any other students interested in rocks and minerals. Not for Geology Majors.

(Fall, Summer)

**GEOL 290 Directed Study**
Prerequisite: Consent of Instructor.
Faculty-student consultation will determine a special area of study and/or research problems that will give students greater preparation for advanced work in geology and related fields. Term of enrollment, credit, and other details will be arranged with instructor. Contact the instructor prior to registering for credit.

(Fall, Winter, Summer)

**GEOL 312 Structural Geology**
Fee: $10.00
Prerequisite: Geol 111 Lab & Geol 112. Must be taken concurrently with Geol 210 and Geol 370.
Fundamentals of rock deformation and rock structures. Introduction to tectonics. Field Trips.

(Fall)

**GEOL 350 Mineralogy & Petrology**
Fee: $35.00
Prerequisite: Geol 111, Geol 112, Chem 105 or Chem 111.
The constitution, origin, and identification of minerals. The genesis, interpretation, and identification of igneous and metamorphic rocks.

(Fall)

**GEOL 370 Stratigraphy & Sedimentation**
Fee: $10.00
Prerequisite: Geol 111 or Geol 112. Must be taken concurrently with Geol 210 and Geol 370.
Introduction to tectonics. Field Trips.

(Fall)

**GEOL 404 Environmental Geology**
Fee: $35.00
Prerequisite: Geol 112 or Instructor's consent.
A detailed look at the environmental issues impacting societies today. Common geologic hazards associated with floods, landslides, volcanoes, and earthquakes will be discussed. The course will focus on the issues of an increasing demand for natural resources by an ever-growing population. Related impacts of waste management and pollution are also addressed.

(Win '07, Win '08, Sum '09, Win '10, Win '11)

(Fall, Summer)

**GEOL 405 Methods of Teaching Earth Science**
Prerequisite: Prerequisite: Ed 270 and SecEd 280, along with 80% of science courses required for the Earth Science Education major must be completed prior to enrolling in this course. In addition this course should not be taken until the semester immediately preceding student teaching.
Earth Science and general science teaching methods needed for certification in Earth Science secondary education are taught. The course focuses on classroom and laboratory techniques utilized in the earth sciences. Practical experience in teaching laboratories, lectures and demonstrations will be emphasized. Students will build a science unit which demonstrates their understanding and application of inquiry and the use of multiple teaching and assessment strategies.

(Fall, Winter)

**GEOL 410 Advanced Field Methods**
Fee: $250.00
Prerequisite: Geol 311, Geol 350, Geol 370, Math 110, Math 111 or Instructors consent.
Field experience covering mapping skills, sample data collection, synthesis of field work and literature, and report writing.

(Fall, Winter)

**GEOL 411 Geochronology**
Fee: $40.00
Prerequisite: Geol 111 or Geol 101, Math 110/Math 111.
Analysis of the origin of earth's major landforms emphasizing the interrelationship between plate tectonics and hydrology in producing the features we see on the earth's surface.

(Win '07, Sum '08, Win '09, Win '10, Sum '11)

(Fall)

**GEOL 412 Geology of North America**
Prerequisite: Geol 250 or Geol 350.
The study of the geologic history of North America. In addition to the topic studied, students will develop skills in searching and comprehending the geologic literature, presenting geologic concepts, and scientific writing.

(Sum '08, Win '09, Win '10, Sum '11, Win '12)

(Fall)

**GEOL 418 Geochronology**
Fee: $20.00
Prerequisite: Geol 111, Chem 105 (Chem 109 recommended) Applying elementary chemical principles to understand natural water systems.

(Win, '08, Win '09, Sun '10, Win '11, Win '12)

(Fall)

**GEOL 420 Soil Geology**
Prerequisite: Geol 111, Chem 105 (Chem 109 recommended) Applying elementary chemical principles to understand natural water systems.

(Win, '08, Win '09, Sum '10, Win '11, Win '12)

(Fall)

**GEOL 425 Hydrology**
Fee: $15.00
Prerequisite: Geol 101 & Geol 102 or Geol 111 & Geol 111L, Math 110.
In depth study of hydrologic issues focusing on groundwater. Movement of water in the aquifer, impacts of pumping and management of water as a natural resource are some of the main topics.

(Win '07, Win '08, Sum '09, Win '10, Win '11)

(Fall, Summer)

**GEOL 426 Field Geology**
Fee: $650.00
Prerequisite: Geol 101 & 102 or Geol 111 & 111L or Instructor's consent.
Field experience covering mapping skills, sample data collection, synthesis of field work and literature, and report writing.

(Fall, Winter, Summer)

**GEOL 427 Field Geology**
Fee: $10.00
Prerequisite: Geol 111 Lab & Geol 112. Must be taken concurrently with Geol 210 and Geol 370.
Fundamentals of rock deformation and rock structures. Introduction to tectonics. Field Trips.

(Fall)

**GEOL 428 Field Geology**
Fee: $35.00
Prerequisite: Geol 111, Geol 112, Chem 105 or Chem 111.
The constitution, origin, and identification of minerals. The genesis, interpretation, and identification of igneous and metamorphic rocks.

(2nd Summer Term)

**GEOL 429 Field Geology**
Prerequisite: Demonstrated abilities to tackle desired subjects.
Directed studies in Geology is designed to allow a student to obtain greater depth of understanding in subject matter not readily available through normal course work. Contact the instructor prior to registering for credit.

(Fall, Winter, Summer)

**GEOL 435 Hydrology**
Fee: $35.00
Prerequisite: Geol 101 & Geol 102 or Geol 111 & Geol 111L, Math 110.
In depth study of hydrologic issues focusing on groundwater. Movement of water in the aquifer, impacts of pumping and management of water as a natural resource are some of the main topics.

(Win '07, Win '08, Sum '09, Win '10, Win '11)

(Fall, Summer)

**GEOL 436 Field Geology**
Fee: $15.00
Prerequisite: Geol 101 & Geol 102 or Geol 111 & Geol 111L, Math 110.
Field experience covering mapping skills, sample data collection, synthesis of field work and literature, and report writing.

(Fall, Winter, Summer)

**GEOL 437 Field Geology**
Fee: $35.00
Prerequisite: Geol 111, Geol 112, Chem 105 or Chem 111.
The constitution, origin, and identification of minerals. The genesis, interpretation, and identification of igneous and metamorphic rocks.

(Fall)

**GEOL 438 Field Geology**
Fee: $10.00
Prerequisite: Geol 111 or Geol 101, Math 110/Math 111.
Analysis of the origin of earth's major landforms emphasizing the interrelationship between plate tectonics and hydrology in producing the features we see on the earth's surface.

(Win ' 07, Sum '08, Win '09, Win '10, Sum '11)

(Fall)

**GEOL 440 Environmental Geology**
Fee: $35.00
Prerequisite: Geol 112 or Instructor's consent.
A detailed look at the environmental issues impacting societies today. Common geologic hazards associated with floods, landslides, volcanoes, and earthquakes will be discussed. The course will also focus on the issues of an increasing demand for natural resources by an ever-growing population. Related impacts of waste management and pollution are also addressed.

(Win '07, Win '08, Sum '09, Win '10, Win '11)

(Fall, Summer)
GEOL 440 Applied GIS (3:2:2)
Fee: $15.00
Prerequisite: Geography 230 - Introduction to GIS and one of the following: Geog 101, or Geol 101, Geol 104, Geol 110, Geol 111, or Instructor’s consent.
Applied GIS (Geographic Information Systems) allows students to apply GIS skills to geologic topics and problems with real-world data sets.
(Sum '08, Win '09, Win '10, Sum '11, Win '12)

GEOL 445 Applied Geophysics (3:3:2)
Fee: $30.00
Prerequisite: Completion or concurrent registration in Phys 123, Completion of Geol 311 & Geol 370 or instructor’s approval.
Learning and applying various geophysical methods to explore and characterize materials in the subsurface. Field trips included.
(Win '07, Win '08, Win '10, Win '11, Sum '12)

GEOL 480 Paleontology (3:3:2)
Fee: $50.00
Prerequisite: Geol 112 or a general biology class.
Distribution, morphology, paleoecology, and evolution of organisms in the geologic record. Includes vertebrates, invertebrates, and plant life.
(Win '08, Win '09, Sum '10, Win '11)

GEOL 498R Geology Internship (1-3:0:0)
Prerequisite: To have completed at least through junior level geology courses.
An on-the-job experience related to the area of geological sciences.

GEOL 499 Senior Project (1-3:0:0)
Prerequisite: Completion of senior level courses in geology. English 316 should have been completed also.
A course which includes original research or field work and results in a publishable paper.
(Fall, Winter, Summer)