# Geology Option

The Geology Option is a degree program designed for students who are motivated to apply the principles of chemistry, physics and mathematics to the study of the Earth's surface and interior. There are outstanding opportunities for employment in the public and private sectors in fields such as petroleum geology, mining geology, seismology (including earthquake and volcanic risk assessment), hydrology (surface and ground water) natural-hazard geology, environmental clean-up and containment of environmental hazards, mitigation of future environmental problems related to development, preservation of water resources (both surface and ground water), and the study of the processes of climate change and global warming. The optimal degree for employment and advancement in the geological sciences in the private sector is the Master's Degree, and the undergraduate Geology Option is an excellent preparatory degree for graduate study. Some students interested in college teaching or advanced research may require a Ph.D. degree. In the Geology Option, students are given the opportunity to learn in the world-class natural laboratory that surrounds Bozeman. Course work progresses from core courses that all students must take (Earth System Science, Topics in Earth Science, Earth History and Evolution, Mineralogy, Sedimentation and Stratigraphy, Structural Geology, Global Tectonics, Sedimentary Petrology, two geographic information science (GIS) courses, Field Methods, and Field Geology (a summer capstone course). Also included are a variety of elective courses in geology, paleontology, hydrology, Weather and Climate, Geomorphology, and remote sensing. These courses prepare the student for a variety of jobs and/or graduate school.

## Freshman Year

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHMY 141</td>
<td>College Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHMY 143</td>
<td>College Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>ERTH 101IN</td>
<td>Earth System Sciences</td>
<td>4</td>
</tr>
<tr>
<td>ERTH 201IN</td>
<td>Honors Earth System Science</td>
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</tr>
<tr>
<td>ERTH 102CS</td>
<td>Topics in Earth Sciences (3 Credits Needed)</td>
<td>1</td>
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<tr>
<td>GEO 211</td>
<td>Earth History and Evolution</td>
<td>3</td>
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<tr>
<td>M 171Q</td>
<td>Calculus I</td>
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</tr>
<tr>
<td>M 172Q</td>
<td>Calculus II</td>
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<td>University Core and Electives</td>
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## Sophomore Year

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>BIOB 170IN</td>
<td>Principles of Biological Diversity</td>
<td>4</td>
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<tr>
<td>GEO 208IN</td>
<td>Earth Materials</td>
<td>3</td>
</tr>
<tr>
<td>GPHY 284</td>
<td>Intro to GIS Science &amp; Cartog</td>
<td>3</td>
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<tr>
<td>GPHY 384</td>
<td>Adv GIS and Spatial Analysis</td>
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<tr>
<td>PHSX 205</td>
<td>College Physics I</td>
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<tr>
<td>PHSX 207</td>
<td>College Physics II</td>
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<td>University Core and Electives</td>
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## Junior Year

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<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ERTH 303</td>
<td>Weather and Climate</td>
<td>3</td>
</tr>
<tr>
<td>ERTH 307</td>
<td>Principles of Geomorphology</td>
<td>4</td>
</tr>
<tr>
<td>GEO 302</td>
<td>Mineralogy and Optical Mineral</td>
<td>4</td>
</tr>
<tr>
<td>GEO 309</td>
<td>Sedimentation and Stratigraphy</td>
<td>4</td>
</tr>
<tr>
<td>GEO 315</td>
<td>Structural Geology</td>
<td>4</td>
</tr>
<tr>
<td>STAT 332</td>
<td>Statistics for Scientists and Engineers</td>
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<td>University Core and Electives</td>
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<td>Year Total:</td>
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## Senior Year

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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEO 429R</td>
<td>Field Geology</td>
<td>2</td>
</tr>
<tr>
<td>GEO 448</td>
<td>Sedimentary Petrology</td>
<td>3</td>
</tr>
<tr>
<td>GEO 449</td>
<td>Metamorphic Petrology</td>
<td>3</td>
</tr>
<tr>
<td>or GEO 450</td>
<td>Igneous Petrology</td>
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</table>

Take at least four of the following: 12

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERTH 450R</td>
<td>Snow Dynamics and Accumulation</td>
<td></td>
</tr>
<tr>
<td>ERTH 484</td>
<td>Quaternary Environment</td>
<td></td>
</tr>
<tr>
<td>ERTH 494</td>
<td>Seminar</td>
<td></td>
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<tr>
<td>GEO 310</td>
<td>Invertebrate Paleontology</td>
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<tr>
<td>GEO 411</td>
<td>Vertebrate Paleontology</td>
<td></td>
</tr>
<tr>
<td>GEO 417</td>
<td>Taphonomy: Fossil Preservation</td>
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<tr>
<td>GEO 433</td>
<td>Global Tectonics</td>
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<tr>
<td>GEO 440</td>
<td>Volcanology</td>
<td></td>
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<tr>
<td>GEO 445</td>
<td>Glacial Geology</td>
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<tr>
<td>GEO 490R</td>
<td>Undergraduate Research</td>
<td></td>
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<tr>
<td>GEO 491</td>
<td>Special Topics</td>
<td></td>
</tr>
<tr>
<td>GEO 492</td>
<td>Independent Study</td>
<td></td>
</tr>
<tr>
<td>GEO 498</td>
<td>Internship</td>
<td></td>
</tr>
<tr>
<td>One course from the following can be counted as an elective:</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GPHY 357</td>
<td>GPS Fund/App in Mapping</td>
<td></td>
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<tr>
<td>GPHY 426</td>
<td>Remote Sensing</td>
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</tr>
<tr>
<td>GPHY 484R</td>
<td>Applied GIS &amp; Spatial Analysis</td>
<td></td>
</tr>
<tr>
<td>University Core and Electives</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

| Year Total:                                       | 24      |

Total Program Credits: 120

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1. Students are required to take 3 credits of ERTH 102CS to fulfill department requirements as well as Core 2.0
2. GEO 429R Should be taken SUMMER of either Junior or Senior year.
3. You must take ONE of either GEO 449 OR GEO 450.
4. Note: Can be repeated, but can only be counted once (each) as a Geology elective.

A grade of C- is required in all courses in this curriculum to graduate by Regents' policy. This includes electives in this curriculum. A minimum of 120 credits is required for graduation; 42 of these credits must be in courses numbered 300 and above.
Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Times was used instead of Adobe Garamond Pro.

The editor may contact Leepfrog for a draft with the correct fonts in place.