

# 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.

<b>Freshman Year</b>	<b>Credits</b>
CHMY 141 - College Chemistry I & CHMY 142 - College Chemistry I Lab	4
CHMY 143 - College Chemistry II & CHMY 144 - College Chemistry II Lab	4
ERTH 101IN - Earth System Sciences or ERTH 201IN - Honors Earth System Science	4
GEO 211 - Earth History and Evolution	3
M 171Q - Calculus I	4
M 172 - Calculus II	4
University Core and Electives	4
Year Total:	27
<b>Sophomore Year</b>	<b>Credits</b>
GPHY 284 - Intro to GIS Science & Cartog	3
PHSX 205 - College Physics I	4
PHSX 207 - College Physics II	4
University Core and Electives	9
GEO 302 - Mineralogy and Optical Mineral	4
GEO 309 - Sedimentation and Stratigraphy	4
GEO 305 - Igneous & Metamorphic Petrology or GEO 443 - Principles of Sedimentary Petrology	3
Year Total:	31
<b>Junior Year</b>	<b>Credits</b>
GEO 315 - Structural Geology	4
STAT 332 - Statistics for Scientists and Engineers	3
University Core and Electives	8
GEO 428 - Field Methods	3
GPHY 384 - Adv GIS and Spatial Analysis	3
Year Total:	21
<b>Senior Year</b>	<b>Credits</b>
GEO 429R - Field Geology <sup>2</sup>	3.0

Take at least five of the following:	12
ERTH 450R - Snow Dynamics and Accumulation	3
ERTH 303 - Weather and Climate	3
ERTH 307 - Principles of Geomorphology	4
ERTH 484 - Climates of the Past, Present and Future	3
ERTH 494 - Seminar	3
GEO 310 - Invertebrate Paleontology	3
GEO 411 - Vertebrate Paleontology	3
GEO 417 - Taphonomy: Fossil Preservation	3
GEO 433 - Tectonics	3
GEO 439 - Geophysics	3
GEO 440 - Volcanology	3
GEO 445 - Glacial Geology	3
GEO 471 - Geochronology and Thermochronology	3
GEO 490R - Undergraduate Research	3
GEO 491 - Special Topics	3
GEO 492 - Independent Study <sup>4</sup>	3
GEO 498 - Internship	3
One course from the following can be counted as an elective:	3
GPHY 426 - Remote Sensing	3
GPHY 484R - Applied GIS & Spatial Analysis	3
University Core and Electives	3
Year Total:	34
<b>Total Program Credits:</b>	<b>120</b>

<sup>2</sup> GEO 429R Should be taken SUMMER of either Junior or Senior year.

<sup>3</sup> You must take ONE of either GEO 305 OR GEO 443.

<sup>4</sup> **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.