Bachelor of Science Degree in Geology

1000-level Geology Courses (3 courses; 7 credit hours):
*If the student joins the program fall semester, the requirement is completed over two semesters. The following courses should be taken:*
GEOL1001C: Geology and Paleontology (3 credits; fall) *and* GEOL1003L: Physical Geology Laboratory (1 credit; fall) *and* GEOL1002C: Earth Surface Processes and Environmental Issues (3 credits; spring)

*If the student joins the program spring semester, the requirement is completed in one semester. The following courses should be taken:*
GEOL1002C: Earth Surface Processes and Environmental Issues (3 credits; spring) *and* GEOL1004: Historical Geology (3 credits; spring) *and* GEOL1004L: Historical Geology Laboratory (1 credit; spring)

*Other introductory courses may be used to fulfill this requirement upon approval.*

2000-level Geology Courses (4 courses; 12 credit hours):
GEOL2005C: Geomorphology (fall)
GEOL2008C: Mineralogy (fall)
GEOL2004C: Sedimentology, Stratigraphy & Earth History (spring)
GEOL2012: The Earth System (spring)

3000-level Geology Courses (choose 4 courses; 12 credit hours):
The student must choose four from the following:
GEOL3000C: Paleontology & Geobiology (fall) *and* GEOL3004C: Structural Geology (spring)
GEOL3002: Geochemistry (fall) *and* GEOL3005C: Hydrogeology (fall)
GEOL3003C: Petrology (spring) *and* GEOL3006: Climate Change Through Time (spring)

*The student is expected to finish 2000-level courses before starting 3000-level courses, unless permission has been granted by the Academic Director to take 2000-level and 3000-level courses concurrently.*

4000-level Geology Courses (4 courses; 12 credit hours): The student is required to take 2 courses from the list below. The remaining two courses will serve as electives and include additional 4000-level lecture courses, including field trips (GEOL4021C, GEOL4022C, GEOL4023, GEOL4033C), seminars, workshops, curatorial courses, one additional 3000-level course, or Introduction to GIS, GEOG5171C.

GEOL4001: Paleontology I (Invertebrate)
GEOL4002: Paleontology II (Vertebrate)
GEOL4003: Sedimentology
GEOL4004: Glacial Geology
GEOL4005: Biodiversity Through Geologic Time
GEOL4007: Marine Paleoenvironments & Paleoecology (1/2 semester)
GEOL4008C: Clay Mineralogy
GEOL4010C: Igneous Processes and Petrogenesis
GEOL4011C: Quaternary Geology
GEOL4012C: Modeling Landscapes
GEOL4013: Organic Geochemistry
GEOL4014: Quantitative Approaches to Paleobiology and Paleoecology

Credit hours in major = 65-69
Credit hours in general education/college requirements = 43-45
Elective hours = 6-12
Total = 120
Full time program duration = 4 years
GEOL4018C: Stratigraphy and Facies Models (1/2 semester)
GEOL4024: Geohydrology and Introduction to Ground-Water Modeling
GEOL4025C: Thermodynamics
GEOL4028: Stable Isotope Biogeochemistry
GEOL4029: Stable Isotope Ecology
GEOL4031C: Quaternary Geochronology
GEOL4034C: Thermochronometric Methods
GEOL4035: Carbon Cycling & Greenhouse Gas Emissions
GEOL4036: Holocene Environmental & Cultural History
GEOL4037: Earth's Early Biosphere
GEOL4038: Analytical methods & Scripting R
GEOL4041C: Changing Landscapes in the Himalaya
GEOL4042: Regional Geology and Tectonics
GEOL4043: Hydraulic Fracturing
GEOL4044: Basin Dynamics
GEOL4048C: Zooarchaeology
GEOL4049C: Microscopy and Raman Spectroscopy
GEOL4055: Plate Tectonics

**Capstone Requirement (minimum 4 credit hours):**
The student is required to participate in a 4-6 credit hour field camp. The field camp must be approved by the Undergraduate Director. Under special circumstances a student may substitute an internship, faculty-advised research project, or other arrangements for partial or full Capstone fulfillment upon approval by the Capstone Advisory Committee.

**Chemistry requirement (10 credit hours).** Must achieve a minimum of a C- in each course. This requirement is to be completed by the end of the second year in the major, or by the time 18 hours of geology courses have been acquired:
CHEM1040, 1040L: General Chemistry I & lab
CHEM1041, 1041L: General Chemistry II & lab

*These chemistry courses have specific math course or placement test prerequisites.*

**Biology and/or Physics requirement (8-10 credit hours).** Must achieve at least a C- in each course. This requirement is to be completed by the end of the third year in the major, or by the time 30 hours of geology courses have been acquired. The student is required to take two courses with laboratories of either BIOL or PHYS (e.g. BIOL1081, 1081L and BIOL1082, 1082L) or the first two courses with laboratories in a sequence of BIOL and PHYS (e.g. PHYS1051, 1051L and BIOL1081, 1081L). The student may choose from the following:
BIOL1081, 1081L: Biology I & lab: Molecules, Cells, and the Foundation of Life
BIOL1082, 1082L: Biology II & lab: Evolution, Physiology, and Ecology
PHYS1051, 1051L: General Physics I & lab (Algebra-based)
PHYS1052, 1052L: General Physics II & lab (Algebra-based)
PHYS2001, 2001L: College Physics I & lab (Calculus-based)
PHYS2002, 2002L: College Physics II & lab (Calculus-based)

*These physics courses have specific math course or placement test prerequisites.*
Quantitative Reasoning requirement (6-8 credit hours). Must achieve a minimum of a C- in each course. This requirement is to be completed by the end of the second year in the major, or by the time 18 hours of geology courses have been acquired:

MATH1044: Applied Calculus I or MATH1061: Calculus I
and
MATH1045: Applied Calculus II or MATH1062: Calculus II or STAT1034: Elementary Statistics I

*The MATH courses have specific math course or placement test prerequisites.*

**Basic curricular progression showing the order for taking courses and their required prerequisites.**

<table>
<thead>
<tr>
<th>Term</th>
<th>1000-level (Foundations + 1 additional)</th>
<th>2000-level (all required)</th>
<th>3000-level (choose at least 4 courses)</th>
<th>4000-level (choose at least 4 courses*)</th>
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<tbody>
<tr>
<td>Fall</td>
<td><strong>Foundations of the Geosciences</strong> (GEOL1099C) + 1 additional 1000-level GEOL course (can be taken in any order or concurrently in one semester)</td>
<td>Mineralogy (GEOL 2008C) &lt;br&gt; Requires GEOL1099C</td>
<td>Paleontology and Geobiology (GEOL3000C) &lt;br&gt; Requires 2004C and 2012</td>
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<td>Geomorphology (GEOL2005C) &lt;br&gt; Requires GEOL1099C</td>
<td>Geochemistry (GEOL3002C) &lt;br&gt; Requires CHEM, 2008C, and 2012</td>
<td>4XXX</td>
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<td>Petrology (GEOL3003C) &lt;br&gt; Requires CHEM, 2004C, 2008C</td>
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<td>Hydrogeology (GEOL3005C) &lt;br&gt; Requires CHEM, 2005C, 2012</td>
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<td>Climate Through Time (GEOL3006) &lt;br&gt; Requires 2012</td>
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<td><em>CHEM and MATH/STAT completed by the end of this semester</em></td>
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<td><em>PHYS/BIOL completed by the end of this semester</em></td>
<td>4XXX</td>
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*Some 4000-level courses may have 3000-level courses as prerequisites.*

Be sure to check with your College advisor to discuss College-specific degree requirements.