# BACHELOR OF SCIENCE IN EARTH SCIENCES: GEOLOGY EMPHASIS ROADMAP

120 Total Units Required  
Minimum Number of Units in the Major: 67

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 115</td>
<td>General Chemistry I: Essential Concepts of Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>ERTH 210</td>
<td>Physical Geology</td>
<td>4</td>
</tr>
<tr>
<td>GE Area A: Oral Communication (A1) or Critical Thinking (A3)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area A: Written English Communication (A2)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area C: Arts (C1)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 226</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>GE Area A: Oral Communication (A1) or Critical Thinking (A3)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area A: Written English Communication II (A4)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>or Written English Communication (A2) Stretch II</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area B: Life Science (B2)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td><strong>Third Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERTH 205</td>
<td>Techniques in Earth Sciences</td>
<td>2</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Calculus II (If completing PYS 220/222)</td>
<td>4</td>
</tr>
<tr>
<td>or SF State Studies or University Elective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 111 &amp; PHYS 112</td>
<td>General Physics I or General Physics with Calculus I and General Physics with Calculus I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>or PHYS 220 and PHYS 222</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE Area A: Written English Communication II (A4) if not already satisfied</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>or SF State Studies or University Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area D: U.S. History (D2) or U.S. and California Government (D3)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td><strong>Fourth Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 121 &amp; PHYS 122</td>
<td>General Physics II or General Physics with Calculus III and General Physics with Calculus III Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>or PHYS 240 and PHYS 242</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE Area C: Arts (C1) or Humanities (C2)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area C: Humanities: Literature (C3)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area D: Social Sciences (D1)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area D: U.S. History (D2) or U.S. and California Government (D3)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td><strong>Fifth Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERTH 400</td>
<td>Earth Systems I</td>
<td>3</td>
</tr>
<tr>
<td>ERTH 420</td>
<td>Mineralogy and Petrology I</td>
<td>4</td>
</tr>
<tr>
<td>Major Emphasis Elective (11–12 units total): Select additional Geology emphasis electives upon advisement</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area UD–B: Upper Division Physical and/or Life Sciences (Consider SF State Studies Course)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area UD–C: Upper Division Arts and/or Humanities (Consider SF State Studies Course)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>

### Sixth Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERTH 500</td>
<td>Earth Systems II</td>
<td>3</td>
</tr>
<tr>
<td>ERTH 505</td>
<td>Quantitative Methods in Earth Sciences</td>
<td>3</td>
</tr>
<tr>
<td>ERTH 522</td>
<td>Geochemistry</td>
<td>3</td>
</tr>
<tr>
<td>or CHEM 215</td>
<td>and CHEM 216</td>
<td>4-5</td>
</tr>
<tr>
<td>ERTH 600GW</td>
<td>Earth’s Climate History - GWAR</td>
<td>3</td>
</tr>
</tbody>
</table>

**Units**: 16

### Seventh Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERTH 510</td>
<td>Structural Geology</td>
<td>4</td>
</tr>
<tr>
<td>ERTH 515</td>
<td>Sedimentology and Stratigraphy</td>
<td>4</td>
</tr>
<tr>
<td>Major Emphasis Elective (11–12 units total): Select additional Geology emphasis electives upon advisement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE Area UD–D: Upper Division Social Sciences (Consider SF State Studies Course)</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Units**: 13-14

### Eighth Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERTH 620</td>
<td>Field Methods in Geology</td>
<td>2</td>
</tr>
<tr>
<td>ERTH 690 &amp; ERTH 695</td>
<td>Earth Sciences Capstone Presentation or Undergraduate Research and Senior Thesis</td>
<td>3-4</td>
</tr>
<tr>
<td>or ERTH 697 &amp; ERTH 698</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major Emphasis Elective (11–12 units total): Select additional Geology emphasis electives upon advisement – Take Two</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>SF State Studies or University Elective</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Units**: 14-15

**Total Units**: 120-122

---

1. To avoid taking additional units, it is recommended that you meet LLD and SF State Studies requirements (AERM, GP, ES, SJ) within your GE or major.

2. ENG 114 can only be taken if you complete Directed Self-Placement (DSP) and select ENG 114; if you choose ENG 104/ENG 105 through DSP you will satisfy A2 upon successful completion of ENG 105 in the second semester; multilingual students may be advised into alternative English courses.