# Bachelor of Arts in Earth Sciences Roadmap

120 Total Units Required  
Minimum Number of Units in the Major: 49

<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 100</td>
<td>Preparation for Chemistry</td>
<td>3</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>Complementary Studies or SF State Studies or University Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
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</tr>
<tr>
<td>CHEM 115</td>
<td>General Chemistry I: Essential Concepts of Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>GE Area A: Oral Communication (A1) or Critical Thinking (A3)</td>
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</tr>
<tr>
<td>GE Area A: Written English Communication II (A4)</td>
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</tr>
<tr>
<td>or Written English Communication (A2) Stretch II</td>
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</tr>
<tr>
<td>GE Area B: Life Science (B2) and Laboratory Science (B3)</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>14-15</td>
</tr>
<tr>
<td><strong>Third Semester</strong></td>
<td></td>
<td></td>
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<tr>
<td>MATH 226 or ERTH 505</td>
<td>Calculus I or Quantitative Methods in Earth Sciences</td>
<td>3-4</td>
</tr>
<tr>
<td>Science and Math Foundation: Chemistry, physics, or mathematics elective (may not be a course designed primarily to satisfy a General Education requirement)</td>
<td></td>
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</tr>
<tr>
<td>GE Area C: Humanities: Literature (C3)</td>
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</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>Complementary Studies or SF State Studies or University Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>14-15</td>
</tr>
<tr>
<td><strong>Fourth Semester</strong></td>
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<tr>
<td>PHYS 111 &amp; PHYS 112 or PHYS 220 and PHYS 222</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>GE Area C: Arts (C1) or Humanities (C2)</td>
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<tr>
<td>GE Area D: Social Sciences (D1)</td>
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<tr>
<td>GE Area D: U.S. History (D2) or U.S. and California Government (D3)</td>
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<tr>
<td>Complementary Studies or SF State Studies or University Elective</td>
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<tr>
<td><strong>Units</strong></td>
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<tr>
<td><strong>Fifth Semester</strong></td>
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<tr>
<td>ERTH 400</td>
<td>Earth Systems I</td>
<td>3</td>
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<tr>
<td>Major Elective – See Note – Take Two</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>GE Area UD–B: Upper Division Physical and/or Life Sciences (Consider SF State Studies Course)</td>
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<tr>
<td>Complementary Studies or SF State Studies or University Elective</td>
<td></td>
<td>3</td>
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<tr>
<td><strong>Units</strong></td>
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<td>15</td>
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<tr>
<td><strong>Sixth Semester</strong></td>
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<tr>
<td>ERTH 205</td>
<td>Techniques in Earth Sciences</td>
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<tr>
<td>ERTH 600GW</td>
<td>Earth’s Climate History - GWAR</td>
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<tr>
<td>Major Elective</td>
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<tr>
<td>GE Area UD–C: Upper Division Arts and/or Humanities (Consider SF State Studies Course)</td>
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<tr>
<td>Complementary Studies or SF State Studies or University Elective</td>
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<tr>
<td><strong>Units</strong></td>
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<tr>
<td><strong>Seventh Semester</strong></td>
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<tr>
<td>ERTH 500</td>
<td>Earth Systems II</td>
<td>3</td>
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<tr>
<td>Major Elective – Take Two</td>
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<tr>
<td>GE Area UD–D: Upper Division Social Sciences (Consider SF State Studies Course)</td>
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<tr>
<td>Complementary Studies or SF State Studies or University Elective</td>
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<tr>
<td><strong>Units</strong></td>
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<tr>
<td><strong>Eighth Semester</strong></td>
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<tr>
<td>ERTH 652 or ERTH 690 and ERTH 695</td>
<td>Geoscience Partners in K–12 Education or Earth Sciences Capstone Presentation and Senior Project</td>
<td>4</td>
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<tr>
<td>Major Elective</td>
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<tr>
<td>Complementary Studies or SF State Studies or University Elective – Take Three</td>
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<td>3</td>
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<tr>
<td><strong>Units</strong></td>
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<td>9</td>
</tr>
<tr>
<td><strong>Total Units</strong></td>
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<td>120-122</td>
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</tbody>
</table>

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.
3 Complementary Studies
Students in all Bachelor of Arts programs at SF State must complete at least twelve units of complementary studies, comprising coursework with a prefix outside of the primary prefix for the major. (For the B.A. program in Earth Sciences, that prefix is ERTH.) Students who complete the Earth Sciences BA program will have met the Complementary Studies requirement automatically by completing the mathematics, physics, and chemistry coursework required for the degree.
Transfer students who have earned AA-T or AS-T degrees and are pursuing a similar B.A. degree at SF State are required to fulfill Complementary Studies requirements for their major only if these courses are included in the minimum units required for the major.

4 Major Elective
Select at least 19 units of Earth & Climate Sciences (ERTH) or closely related coursework, with a coherent theme approved by a Department of Earth & Climate Sciences advisor. At least 15 elective units must come from upper-division coursework. At least 11 elective units must come from ERTH courses. No more than 4 of the 19 elective units can come from courses designed primarily to satisfy General Education requirements (such as 100 and 300 level ERTH courses).