BACHELOR OF SCIENCE IN
EARTH SCIENCES: GEOLOGY
EMPHASIS ROADMAP

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

Course | Title | Units
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**First Semester**
- CHEM 115 | General Chemistry I: Essential Concepts of Chemistry | 5
- ERTH 210 | Physical Geology | 4
- GE Area A: Oral Communication (A1) or Critical Thinking (A3) | 3
- GE Area A: Written English Communication (A2) | 3
- GE Area C: Arts (C1) | 3

Units | 18

**Second Semester**
- MATH 226 | Calculus I | 3
- GE Area A: Oral Communication (A1) or Critical Thinking (A3) | 3
- GE Area A: Written English Communication II (A4) | 3
- or Written English Communication (A2) Stretch II | 3
- GE Area B: Life Science (B2) | 3

Units | 13

**Third Semester**
- ERTH 205 | Techniques in Earth Sciences | 2
- MATH 227 | Calculus II (If completing PYS 220/222) | 4
- or SF State Studies or University Elective | 
- PHYS 111 & PHYS 112 or PHYS 220 and PHYS 222 | General Physics I or General Physics with Calculus I and General Physics with Calculus I Laboratory | 4
- GE Area A: Written English Communication II (A4) if not already satisfied | 3
- or SF State Studies or University Elective | 
- GE Area D: U.S. History (D2) or U.S. and California Government (D3) | 3

Units | 16

**Fourth Semester**
- PHYS 121 & PHYS 122 or PHYS 240 and PHYS 242 | General Physics II or General Physics with Calculus III and General Physics with Calculus III Laboratory | 4
- GE Area C: Arts (C1) or Humanities (C2) | 3
- GE Area C: Humanities: Literature (C3) | 3
- GE Area D: Social Sciences (D1) | 3
- GE Area D: U.S. History (D2) or U.S. and California Government (D3) | 3

Units | 16

**Fifth Semester**
- ERTH 400 | Earth Systems I | 3
- ERTH 420 | Mineralogy and Petrology I | 4
- Major Emphasis Elective (11–12 units total): Select additional Geology emphasis electives upon advisement | 3
- GE Area UD–B: Upper Division Physical and/or Life Sciences (Consider SF State Studies Course) | 3
- GE Area UD–C: Upper Division Arts and/or Humanities (Consider SF State Studies Course) | 3

Units | 16

**Sixth Semester**
- ERTH 500 | Earth Systems II | 3
- ERTH 505 | Quantitative Methods in Earth Sciences | 3
- ERTH 522 or CHEM 215 and CHEM 216 | Geochemistry or General Chemistry II: Quantitative Applications of Chemistry Concepts and General Chemistry II Laboratory: Quantitative Applications of Chemistry Concepts | 4-5
- ERTH 600GW | Earth’s Climate History - GWAR | 3

Units | 13-14

**Seventh Semester**
- ERTH 510 | Structural Geology | 4
- ERTH 515 | Sedimentology and Stratigraphy | 4
- Major Emphasis Elective (11–12 units total): Select additional Geology emphasis electives upon advisement | 3
- GE Area UD–D: Upper Division Social Sciences (Consider SF State Studies Course) | 3

Units | 14

**Eighth Semester**
- ERTH 620 | Field Methods in Geology | 2
- ERTH 690 & ERTH 695 or ERTH 697 and ERTH 698 | Earth Sciences Capstone Presentation or Undergraduate Research and Senior Thesis | 3-4
- Major Emphasis Elective (11–12 units total): Select additional Geology emphasis electives upon advisement – Take Two | 6
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<thead>
<tr>
<th>SF State Studies or University Elective</th>
<th>3</th>
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<tbody>
<tr>
<td>Units</td>
<td>14-15</td>
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<tr>
<td>Total Units</td>
<td>120-122</td>
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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 Depending on courses completed through Early Start and in high school, students in Pathway/Category 3 or 4 may be required to enroll in additional courses before they can take MATH 199 or MATH 226. Most students in Pathway/Category 3 or 4 will need to take a stretch format for MATH 199 (MATH 197 in Fall 2018 and MATH 198 in Spring 2019). Before enrolling in a B4 course, students should verify their MATH Pathway/Category in their Student Center (http://cms.sfsu.edu/content/student-center). Information regarding the courses that correspond with your MATH Pathway/Category can be found on the Developmental Studies Office Website (http://developmentalstudies.sfsu.edu).