# Bachelor of Science in Environmental Science - Quantitative Reasoning

**Category III/IV and ENG 114**

<table>
<thead>
<tr>
<th>120 Total Units Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Number of Units in the Major: 68</td>
</tr>
</tbody>
</table>

### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 114</td>
<td>Writing the First Year: Finding Your Voice (A2)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 197</td>
<td>Prelude to Calculus I (Prerequisite for MATH 226)</td>
<td>3</td>
</tr>
</tbody>
</table>

| GE Area A | 3 |
| GE Area C | 3 |
| GE Area D | 3 |

#### Units: 15

### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 180</td>
<td>Chemistry for the Energy and the Environment (Major Lower-Division Core, B1, B3, ES)</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 101</td>
<td>Our Physical Environment (Major Lower-Division Core, B1, ES)</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 102</td>
<td>The Human Environment (Major Lower-Division Core, D1, ES, GP)</td>
<td>3</td>
</tr>
</tbody>
</table>

| MATH 198 | Prelude to Calculus II (Prerequisite for MATH 226, B4) | 3 |
| GE Area E | 3 |

#### Units: 15

### Third Semester

Select One (Major Lower-Division Core):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 150</td>
<td>The World of Plants (B2, B3, ES)</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 170</td>
<td>Animal Diversity (B2, ES)</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 313</td>
<td>Principles of Ecology</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 205</td>
<td>Geographic Techniques (Major Lower-Division Core)</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 160</td>
<td>Introduction to Environmental Science (Major Core)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 226</td>
<td>Calculus I (Major Core, B4)</td>
<td>4</td>
</tr>
</tbody>
</table>

### Fourth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 227</td>
<td>Calculus II (If taking PHYS 220/PHYS 222)</td>
<td>4</td>
</tr>
</tbody>
</table>

or SF State Studies or University Elective

Select One Set of Courses (Major Lower-Division Core):

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>PHYS 111 &amp; PHYS 112</td>
<td>General Physics I and General Physics I Laboratory (B1, B3)</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 220 &amp; PHYS 222</td>
<td>General Physics with Calculus I and General Physics with Calculus I Laboratory (B1, B3)</td>
<td>4</td>
</tr>
</tbody>
</table>

| GE Area C - Take Two | 6 |
| GE Area D | 3 |

#### Units: 17

### Fifth Semester

<table>
<thead>
<tr>
<th>Course</th>
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<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 500GW</td>
<td>Physical and Human Dimensions of Climate Change - GWAR (Major Upper-Division Core)</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 603</td>
<td>Introduction to Geographic Information Systems (Major Upper-Division Core)</td>
<td>3</td>
</tr>
</tbody>
</table>

| GE Area UD-B: Upper-Division Physical and/or Life Sciences (Consider SF State Studies Course) | 3 |
| SF State Studies or University Elective – Take Two | 5 |

#### Units: 17

### Sixth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Environmental Science Electives (12 Units Total) - Take One</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Major Environmental Management Electives (12 Units Total) - Take One</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Major Analytical Methods Electives (8 Units Total) - Take One</td>
<td>3-4</td>
<td></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>
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#### Units: 15

### Seventh Semester

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<td></td>
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<tr>
<td>Major Environmental Management Electives (12 Units Total) - Take One</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Major Analytical Methods Electives (8 Units Total) - Take One</td>
<td>3-4</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>
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#### Units: 12-15
## Eighth Semester

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>GEOG 690</td>
<td>Senior Seminar in Geography and Environmental Science (Major Capstone)</td>
<td>3</td>
</tr>
</tbody>
</table>

Major Environmental Science Electives (12 Units Total) – Take Two

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>6-7</td>
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Major Environmental Management Electives (12 Units Total) – Take Two

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<td></td>
<td></td>
<td>15-17</td>
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</table>

Total Units 120-125

1. 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 GE Area A2 upon successful completion of ENG 105 in the second semester; multilingual students may be advised into alternative English courses.

2. Depending on courses completed through Early Start, students in Pathway/Category III or IV may be required to enroll in a support course to complement their Quantitative Reasoning/B4 requirement. There are multiple course options for this pathway. 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).

3. QR Category III students with a grade of B or higher in high school pre-calculus in the past year may be able to enroll in MATH 226. Please see a department advisor.

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

5. **Environmental Science Electives (12 units)**
   - CHEM 380 Chemistry Behind Environmental Pollution (3 units) (UD-B, ES)
   - GEOG 312 Geography of Landforms (4 units)
   - GEOG 313 Earth’s Climate System (4 units)
   - GEOG 314 Bioclimatology (4 units)
   - GEOG 316 Biogeography (4 units)
   - GEOG 317 Geography of Soils (4 units)
   - GEOG 342/ERTH 442 Surface Water Hydrology (4 units)
   - GEOG 644 Water Quality (3 units)

6. **Environmental Management Electives (12 units)**
   - GEOG 421 Future Environments (3 units) (UD-D, ES, GP, SJ)
   - GEOG 427 Agriculture and Food Supply (4 units) (ES, GP)
   - GEOG 642/ERTH 642 Watershed Assessment and Restoration (4 units)
   - GEOG 646 The Geography of Marine Resources (4 units)
   - GEOG 647 Geography of Water Resources (4 units)
   - GEOG 648 Management of National Parks and Protected Areas (4 units)
   - GEOG 652/USP 652 Environmental Impact Analysis (4 units)
   - GEOG 657/ENVS 657 Natural Resource Management: Biotic Resources (4 units)
   - GEOG 666 Geography of Garbage: Recycling and Waste Reduction (3 units) (ES)

7. **Analytical Methods Electives (12 units)**
   - BIOL 458 Biometry (4 units)
   - GEOG 602 Field Methods in Physical Geography (4 units)

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- GEOG 610 Remote Sensing of the Environment I (4 units)
- GEOG 611 Remote Sensing of the Environment II (4 units)
- GEOG 620 Geographical Information Systems (4 units)
- GEOG 621 Geographic Information Systems for Environmental Analysis (4 units)
- GEOG 625 Programming for Geographic Information Science (4 units)
- GEOG 629 Coastal and Marine Applications of GIS (3 units)