

# BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE ROADMAP

120 Total Units Required  
 Minimum Number of Units in the Major: 65

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.

Course	Title	Units
<b>First Semester</b>		
ENG 114	Writing the First Year: Finding Your Voice (A2) <sup>1</sup>	3
MATH 226	Calculus I (Major Lower-Division Core, B4) <sup>2</sup>	4
GE Area A <sup>3</sup>		3
GE Area C		3
GE Area D: U.S. History (D2)		3
<b>Units</b>		<b>16</b>
<b>Second Semester</b>		
CHEM 180	Chemistry for Energy and the Environment (Major Lower-Division Core, B1, B3, ES)	3
GEOG 101	Our Physical Environment (Major Lower-Division Core, B1, ES)	3
GEOG 102	The Human Environment (Major Lower-Division Core, D1, ES, GP)	3
GEOG 160	Introduction to Environmental Science (Major Lower-Division Core, B2, B3, ES, GP)	4
GE Area E		3
<b>Units</b>		<b>16</b>
<b>Third Semester</b>		
Select One (Major Lower-Division Core):		3
BIOL 150	The World of Plants (B2, B3, ES)	
BIOL 170	Animal Diversity (B2, ES)	
BIOL 313	Principles of Ecology	
GEOG 205	Geographic Techniques (Major Lower-Division Core)	3

GE Area A		3
GE Area C		3
SF State Studies or University Elective		3
<b>Units</b>		<b>15</b>
<b>Fourth Semester</b>		
Select One Set of Courses (Major Lower-Division Core):		4
PHYS 111 & PHYS 112	General Physics I and General Physics I Laboratory (B1, B3)	
PHYS 220 & PHYS 222	General Physics with Calculus I and General Physics with Calculus I Laboratory (B1, B3)	
GE Area B: Life Science (B2) or SF State Studies or University Elective if B2 already fulfilled		3
GE Area C		3
SF State Studies or University Elective		3
<b>Units</b>		<b>13</b>
<b>Fifth Semester</b>		
GEOG 500GW	Physical and Human Dimensions of Climate Change - GWAR (Major Upper-Division Core)	3
GEOG 603	Introduction to Geographic Information Systems (Major Upper-Division Core)	3
GE Area F <sup>±</sup>		3
GE Area UD-B: Upper-Division Physical and/or Life Sciences		3
U.S. and California Government ( <a href="http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg">http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg</a> )		3
<b>Units</b>		<b>15</b>
<b>Sixth Semester</b>		
Major Environmental Science Electives (11-12 Units Total) - Take One <sup>4</sup>		3-4
Major Environmental Management Electives (11-12 Units Total) - Take One <sup>5</sup>		3-4
Major Analytical Methods Electives (7-8 Units Total) - Take One <sup>6</sup>		3-4
GE Area UD-C: Upper-Division Arts and/or Humanities		3
SF State Studies or University Elective		3
<b>Units</b>		<b>15-18</b>
<b>Seventh Semester</b>		
Major Environmental Science Electives (11-12 Units Total) - Take One <sup>4</sup>		3-4
Major Environmental Management Electives (11-12 Units Total) - Take One <sup>5</sup>		3-4
Major Analytical Methods Electives (7-8 Units Total) - Take One <sup>6</sup>		3-4
GE Area UD-D: Upper-Division Social Sciences		3
SF State Studies or University Elective		3
<b>Units</b>		<b>15-18</b>

**Eighth Semester**

GEOG 690	Senior Seminar in Geography and Environmental Science (Major Capstone)	3
Major Environmental Science Electives (11-12 Units Total) – Take Two <sup>4</sup>		6-7
Major Environmental Management Electives (11-12 Units Total) – Take Two <sup>5</sup>		6-7
<b>Units</b>		<b>15-17</b>
<b>Total Units</b>		<b>120-128</b>

GEOG 625 Programming for Geographic Information Science (3 units)

± Given catalog rights, fall 2023 transfer students do not need to complete an Area F course.

<sup>1</sup> 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.

<sup>2</sup> To determine the best B4 course option, students should complete the online advising activity at mathadvising.sfsu.edu (<https://mathadvising.sfsu.edu/>). Questions? Contact Gator Smart Start. (<https://gatorsmartstart.sfsu.edu/>)

<sup>3</sup> To avoid taking additional units, it is recommended that you meet the **SF State Studies** (AERM, GP, ES, SJ) requirements within your GE or major.

**<sup>4</sup> Environmental Science Electives (11-12 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)

**<sup>5</sup> Environmental Management Electives (11-12 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)

**<sup>6</sup> Analytical Methods Electives (7-8 units)**

BIOL 458 Biometry (4 units)

GEOG 602 Field Methods in Environmental Science & Physical Geography (4 units)

GEOG 604 Environmental Data Science (3 units)

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)