

BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE ROADMAP – QUANTITATIVE REASONING CATEGORY III/IV AND STRETCH ENGLISH

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
First Semester		
ENG 104	Writing the First Year: Finding Your Voice Stretch I ¹	3
MATH 197	Prelude to Calculus I (Prerequisite for MATH 226) ^{2,3}	3
GE Area A ⁴		3
GE Area C		3
GE Area D: U.S. History (D2)		3
		Units 15
Second Semester		
CHEM 180	Chemistry for Energy and the Environment (Major Lower-Division Core, B1, B3, ES)	3
ENG 105	Writing the First Year: Finding Your Voice Stretch II (A2) ¹	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
MATH 198	Prelude to Calculus II (Prerequisite for MATH 226, B4) ^{2,3}	3
		Units 15
Third Semester		
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 160	Introduction to Environmental Science (Major Core)	4
GEOG 205	Geographic Techniques (Major Lower-Division Core)	3
MATH 226	Calculus I (Major Core, B4) ^{2,3}	4
GE Area E		3
		Units 17
Fourth Semester		
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 A		3
GE Area B: Life Science (B2)		3
or SF State Studies or University Elective if B2 already fulfilled		
GE Area C - Take Two		6
		Units 16
Fifth Semester		
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 [±]		3
GE Area UD-B: Upper-Division Physical and/or Life Sciences (Consider SF State Studies Course)		3
U.S. and California Government (http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg)		3
		Units 15
Sixth Semester		
Major Environmental Science Electives (11-12 Units Total) - Take One ⁵		3-4
Major Environmental Management Electives (11-12 Units Total) - Take One ⁶		3-4
Major Analytical Methods Electives (7-8 Units Total) - Take One ⁷		3-4
GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course)		3
SF State Studies or University Elective		3
		Units 15-18
Seventh Semester		
Major Environmental Science Electives (11-12 Units Total) - Take One ⁵		3-4

Major Environmental Management Electives (11-12 Units Total) - Take One ⁶	3-4
Major Analytical Methods Electives (7-8 Units Total) - Take One ⁷	3-4
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course)	3

Eighth Semester	Units	12-15
GEOG 690	Senior Seminar in Geography and Environmental Science (Major Capstone)	3
Major Environmental Science Electives (11-12 Units Total) – Take Two ⁵		6-7
Major Environmental Management Electives (11-12 Units Total) – Take Two ⁶		6-7
	Units	15-17
	Total Units	120-128

⁷ **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 Geographical 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)

± Given catalog rights, fall 2022 transfer students do not need to complete an Area F course.

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 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/>)

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 the **SF State Studies** (AERM, GP, ES, SJ) requirements within your GE or major.

⁵ **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)

⁶ **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)