

# BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN ECOLOGY, EVOLUTION, AND CONSERVATION BIOLOGY ROADMAP – QUANTITATIVE REASONING CATEGORY I/II AND ENG 114

120 Total Units Required

Minimum Number of Units in the Major: 59

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>		
BIOL 230	Introductory Biology I (Major Lower-Division Core)	5
BIOL 231	Advising for Success as a Biology Major (Major Lower-Division Core)	1
ENG 114	Writing the First Year: Finding Your Voice (A2) <sup>1</sup>	3
GE Area A <sup>2</sup>		3
GE Area C		3
		<b>Units</b>
		<b>15</b>
<b>Second Semester</b>		
BIOL 240	Introductory Biology II (Major Lower-Division Core)	5
CHEM 115	General Chemistry I: Essential Concepts of Chemistry (Major Lower-Division Core)	5
GE Area A		3
GE Area E		3
		<b>Units</b>
		<b>16</b>
<b>Third Semester</b>		
BIOL 482	Ecology (Major Upper-Division Core)	4
MATH 226	Calculus I (Major Lower-Division Core, B4) <sup>3</sup>	4
GE Area C		3

GE Area D		3
		<b>Units</b>
		<b>14</b>
<b>Fourth Semester</b>		
BIOL 355	Genetics (Major Upper-Division Core)	3
PHYS 111 & PHYS 112	General Physics I and General Physics I Laboratory (Major Lower-Division Core, B1, B3)	4
GE Area C		3
GE Area D		3
SF State Studies or University Elective		3
		<b>Units</b>
		<b>16</b>
<b>Fifth Semester</b>		
BIOL 337	Evolution (Major Upper-Division Core)	3
BIOL 458	Biometry (Major Upper-Division Core)	4
Ecology Elective (9 units total) <sup>4</sup>		3
SF State Studies or University Elective		4
		<b>Units</b>
		<b>14</b>
<b>Sixth Semester</b>		
Ecology Elective (9 units total) <sup>4</sup>		3
GWAR Option - Select One <sup>5</sup>		3
GE Area F		3
GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course)		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>Seventh Semester</b>		
Ecology Elective (9 units total) <sup>4</sup>		3
Physiology and Additional Electives (9 units total) <sup>6</sup>		3
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course)		3
SF State Studies or University Elective - Take Two		6
		<b>Units</b>
		<b>15</b>
<b>Eighth Semester</b>		
Physiology and Additional Electives (9 units total) - Take Two <sup>6</sup>		6
SF State Studies or University Elective – Take Three		9
		<b>Units</b>
		<b>15</b>
		<b>Total Units</b>
		<b>120</b>

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

<sup>2</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>3</sup> 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/>).

<sup>4</sup> **Ecology and Evolution Electives - 9 units**

BIOL 380 Evolutionary Developmental Biology (3 units)  
 BIOL 411 Environmental Microbiology (3 units)  
 BIOL 453 General Parasitology (3 units)  
 BIOL 460 General Entomology (4 units)  
 BIOL 461 Insect Taxonomy (4 units)  
 BIOL 470 Natural History of Vertebrates (4 units)  
 BIOL 475GW Herpetology - GVAR (3 units)  
 BIOL 478GW Ornithology - GVAR (4 units)  
 BIOL 490 Ecology of Infectious Diseases (4 units)  
 BIOL 500 Evolution and Diversity of Plants (4 units)  
 BIOL 502 Biology of the Algae (3 units)  
 BIOL 504 Biology of the Fungi (4 units)  
 BIOL 505 Comparative Anatomy of Vascular Plants (4 units)  
 BIOL 514 Plant Biodiversity and California Field Botany (5 units)  
 BIOL 529GW Plant Ecology - GVAR (4 units)  
 BIOL 530 Conservation Biology (3 units)  
 BIOL 532 Restoration Ecology (3 units)  
 BIOL 534 Wetland Ecology (4 units)  
 BIOL 555 Marine Invertebrate Zoology (4 units)  
 BIOL 570GW Biology of Fishes - GVAR (4 units)  
 BIOL 577 Climate and Ecological Interactions (4 units)  
 BIOL 580 Limnology (3 units)  
 BIOL 582 Biological Oceanography & Limnology (4 units)  
 BIOL 585 Marine Ecology (3 units)  
 BIOL 600 Animal Behavior (3 units)  
 BIOL 670GW Ecology and Evolution of Marine Systems I - GVAR (6 units)  
 BIOL 671 Ecology and Evolution of Marine Systems II (6 units)

<sup>5</sup> **GVAR Course - Select One**

BIOL 475GW Herpetology - GVAR (3 units)  
 BIOL 478GW Ornithology - GVAR (4 units)  
 BIOL 529GW Plant Ecology - GVAR (4 units)  
 BIOL 570GW Biology of Fishes - GVAR (4 units)  
 BIOL 670GW Ecology and Evolution of Marine Systems I - GVAR (6 units)

<sup>6</sup> **Physiology and Additional Electives - 9 units**  
BIOL 315 Field Methods in Ecology and Evolution (1 units)  
BIOL 322 Human Sexuality: Integrative Science (3 units)  
BIOL 327 AIDS: Biology of the Modern Epidemic (3 units) (UD-B, GP)  
BIOL 328 Human Anatomy (4 units)  
BIOL 344GW Research Skills - GVAR (3 units)  
BIOL 349 Bioethics (3 units) (UD-B, SJ)  
BIOL 350 Cell Biology (3 units)  
BIOL 356 Honors Genetics (2 units)  
BIOL 357 Molecular Genetics (3 units)  
BIOL 358 Forensic Genetics: Math Matters (4 units)  
BIOL 382 Developmental Biology (3 units)  
BIOL 391 Microscopy and Photomicrography (2 units)  
BIOL 401 General Microbiology (3 units)  
BIOL 420 General Virology (3 units)  
BIOL 425 Emerging Diseases (3 units)  
BIOL 430 Medical Microbiology (3 units)  
BIOL 435 Immunology (3 units)  
BIOL 436 Immunology Laboratory (2 units)  
BIOL 442 Microbial Physiology (3 units)  
BIOL 443 Microbial Physiology Laboratory (2 units)  
BIOL 446 Microbial Genomics (4 units)  
BIOL 454 Parasitology Laboratory (1 units)  
BIOL 475GW Herpetology - GVAR (3 units)  
BIOL 478GW Ornithology - GVAR (4 units)  
BIOL 490 Ecology of Infectious Diseases (4 units)  
BIOL 492 Comparative Anatomy of Vertebrates (4 units)  
BIOL 500 Evolution and Diversity of Plants (4 units)  
BIOL 502 Biology of the Algae (3 units)  
BIOL 504 Biology of the Fungi (4 units)  
BIOL 504 Biology of the Fungi (4 units)  
BIOL 505 Comparative Anatomy of Vascular Plants (4 units)  
BIOL 508 Plants and Human Affairs (3 units)  
BIOL 514 Plant Biodiversity and California Field Botany (5 units)  
BIOL 525 Plant Physiology (3 units)  
BIOL 526 Plant Molecular Physiology Laboratory (2 units)  
BIOL 532 Restoration Ecology (3 units)  
BIOL 534 Wetland Ecology (4 units)  
BIOL 550 Plant and Animal Interactions (4 units)  
BIOL 555 Marine Invertebrate Zoology (4 units)  
BIOL 556 Natural History of Marine Invertebrates (4 units)  
BIOL 570GW Biology of Fishes - GVAR (4 units)  
BIOL 572 Colloquium in Ecology, Evolution, and Conservation (2 units)  
BIOL 575 Fisheries Biology (3 units)  
BIOL 577 Climate and Ecological Interactions (4 units)  
BIOL 580 Limnology (3 units)  
BIOL 584 Marine Microbial Ecology Laboratory (1 units)  
BIOL 585 Marine Ecology (3 units)  
BIOL 586GW Marine Ecology Laboratory - GVAR (4 units)  
BIOL 600 Animal Behavior (3 units)  
BIOL 612 Human Physiology (3 units)  
BIOL 617 Environmental Physiology (3 units)  
BIOL 620 Endocrinology (3 units)  
BIOL 621 Reproductive Physiology (3 units)  
BIOL 622 Hormones and Behavior (3 units)  
BIOL 630 Animal Physiology (3 units)  
BIOL 638 Bioinformatics and Genome Annotation (4 units)  
BIOL 640 Cellular Neurosciences (3 units)  
BIOL 642 Neural Systems Physiology (3 units)  
BIOL 644 LEADerS Service Learning Course: Learners Engaged in Advocating for Diversity in Science (4 units)  
or BIOL 652 Science Education Partners in Biology (4 units)

or BIOL 654 Peer Assistants for Learning Science (PALS) (4 units)  
BIOL 670GW Ecology and Evolution of Marine Systems I - GVAR (6 units)  
BIOL 671 Ecology and Evolution of Marine Systems II (6 units)  
BIOL 699 Independent Study in Biology (1-3 units)