

BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN ZOOLOGY - QUANTITATIVE REASONING CATEGORY III/IV AND STRETCH ENGLISH

120 Total Units Required

Minimum Number of Units in the Major: 67

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		
BIOL 230	Introductory Biology I (Major Lower-Division Core)	5
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 D		3
	Units	17
Second Semester		
CHEM 115	General Chemistry I: Essential Concepts of Chemistry (Major Lower-Division Core)	5
ENG 105	Writing the First Year: Finding Your Voice Stretch II (A2) ¹	3
MATH 198	Prelude to Calculus II (Prerequisite for MATH 226) ^{2,3}	3
PHYS 111 & PHYS 112	General Physics I and General Physics I Laboratory (Major Lower-Division Core, B1, B3)	4
	Units	15
Third Semester		
BIOL 240	Introductory Biology II	5
MATH 226	Calculus I (Major Lower-Division Core, B4) ^{2,3}	4
GE Area A		3

GE Area E		3
	Units	15
Fourth Semester		
BIOL 458	Biometry (Major Upper-Division Core)	4
CHEM 130	General Organic Chemistry (Major Lower-Division Core)	3
Select One (Major Lower-Division Core):		4-5
CHEM 215 & CHEM 216	General Chemistry II: Quantitative Applications of Chemistry Concepts and General Chemistry II Laboratory: Quantitative Applications of Chemistry Concepts	
MATH 227	Calculus II	
PHYS 121 & PHYS 122	General Physics II and General Physics II Laboratory	
Ecology Course - Select One ⁵		3-4
	Units	14-16
Fifth Semester		
BIOL 355	Genetics (Major Upper-Division Core) ⁶	3
Select One (Major Lower-Division Core):		4-5
CHEM 215 & CHEM 216	General Chemistry II: Quantitative Applications of Chemistry Concepts and General Chemistry II Laboratory: Quantitative Applications of Chemistry Concepts	
MATH 227	Calculus II	
PHYS 121 & PHYS 122	General Physics II and General Physics II Laboratory	
GE Area C - Take Two		6
GE Area D		3
	Units	16-17
Sixth Semester		
BIOL 337	Evolution	3
Major Upper-Division Electives (11-14 units) - Take One ⁷		3
Major Upper-Division Core - Select One ⁸		3
GE Area C		3
GE Area D		3
	Units	15
Seventh Semester		
Major Upper-Division Electives (11-14 units) - Take One ⁷		3

Major Upper-Division Taxonomy or Whole Organism Biology of an Invertebrate or Vertebrate ⁹	3-4
GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course)	3
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course)	3
SF State Studies or University Elective	3
Units	15-16
Eighth Semester	
Major Upper-Division Electives (11-14 Units Total) - Take Two ⁷	6
SF State Studies or University Elective – Take Two	7
Units	13
Total Units	120-124

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 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.

⁵ **Ecology Course - Select One**

- BIOL 482 Ecology (4 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 577 Ecological and Environmental Modeling (4 units)
- BIOL 580 Limnology (3 units)
- BIOL 582 Biological Oceanography (4 units)
- BIOL 585 Marine Ecology (3 units)
- BIOL 586 Marine Ecology Laboratory (2 units)

⁶ Upper-Division General Education: Physical and Life Sciences (UD-B) is satisfied upon completion of BIOL 355.

⁷ **Electives (11-14 units)**

Upon advisement choose from the alternates not used in fulfilling the "Taxonomy or Whole Organism Biology of an Invertebrate or Vertebrate" or "Major Upper-Division Core Selection One" or "Major Upper-Division Core Selection Two" requirements listed below or any other upper-division Biology courses not specifically excluded for major credit, or any graduate Biology course.

⁸ **Major Upper-Division Core - Select One**

- BIOL 350 Cell Biology (3 units)
- BIOL 357 Molecular Genetics (3 units)
- BIOL 380 Evolutionary Developmental Biology (3 units)
- BIOL 382 Developmental Biology (3 units)
- BIOL 453 General Parasitology (3 units)
- BIOL 600 Animal Behavior (3 units)
- BIOL 612 Human Physiology (3 units)
- BIOL 620 Endocrinology (3 units)
- BIOL 621 Reproductive Physiology (3 units)
- BIOL 630 Animal Physiology (3 units)

⁹ **Major Upper-Division Taxonomy or Whole Organism Biology of an Invertebrate or Vertebrate - Select One**

- BIOL 460 General Entomology (4 units)
- BIOL 461 Insect Taxonomy (4 units)
- BIOL 464 Medical Entomology (3 units)
- BIOL 475GW Herpetology - GVAR (3 units)*
- BIOL 478GW Ornithology - GVAR (4 units)*
- BIOL 555 Marine Invertebrate Zoology (4 units)
- BIOL 570GW Biology of Fishes - GVAR (4 units)*

* Students must complete at least one GVAR course in order to graduate.