# Bachelor of Science in Biology: Concentration in Zoology Roadmap

120 Total Units Required  
Minimum Number of Units in the Major: 67

| Course | First Semester | | Second Semester | | Third Semester | | Fourth Semester | | Fifth Semester | | Sixth Semester | | Seventh Semester | | Eighth Semester |
|--------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|        |                | **Title**       | **Units**       | **Title**       | **Units**       | **Title**       | **Units**       | **Title**       | **Units**       | **Title**       | **Units**       | **Title**       | **Units**       |
|        |                | General Chemistry I: Essential Concepts of Chemistry | 5 | **Introductory Biology I** | 5 | **CHEM 130** | General Organic Chemistry | 3 | **Introductory Biology II** | 5 | **CHEM 215** | General Chemistry II: Quantitative Applications of Chemistry Concepts (3 units) | 3 |
|        |                | GE Area A: Oral Communication (A1) or Critical Thinking (A3) | 3 | Major Lower Division Requirement (16-17 Units Total) 4 | 4-5 | Major Lower Division Requirement (16-17 Units Total) 4 | 4-5 | Major Lower Division Requirement (16-17 Units Total) 4 | 4-5 | Major Lower Division Requirement (16-17 Units Total) 4 | 4-5 |
|        |                | GE Area A: Written English Communication (A2) 2 | 3 | GE Area A: Written English Communication II (A4) if not already satisfied | 3 | GE Area A: Written English Communication II (A4) if not already satisfied | 3 | GE Area A: Written English Communication II (A4) if not already satisfied | 3 | GE Area A: Written English Communication II (A4) if not already satisfied | 3 |
|        |                | GE Area B: Quantitative Reasoning (B4) 3 | 3 | or SF State Studies or University Elective | 3 | or SF State Studies or University Elective | 3 | or SF State Studies or University Elective | 3 | or SF State Studies or University Elective | 3 |
|        |                | **Units**       | **Units**       | **Units**       | **Units**       | **Units**       | **Units**       | **Units**       | **Units**       | **Units**       | **Units**       | **Units**       |
|        |                | 14 | 15 | 16 | 16 | 16-17 | 16 | 15-17 | 15-17 | 15-17 | 13 |

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

**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.**

**Depending on courses completed through Early Start, students in Pathway/Category 3 or 4 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).**

**Upon advisement choose from the alternates not used in fulfilling the requirements listed above or any other upper division biology courses not specifically excluded for major credit, or any graduate biology course.**

## Major Lower Division Requirements

- CHEM 215 General Chemistry II: Quantitative Applications of Chemistry Concepts (3 units)  
- CHEM 216 General Chemistry II Laboratory: Quantitative Applications of Chemistry Concepts (2 units)  
- MATH 226 Calculus I (4 units)  
- MATH 227 Calculus II (4 units)  
- PHYS 111 General Physics I (3 units)  
- PHYS 112 General Physics I Laboratory (1 units)  
- PHYS 121 General Physics II (3 units)  
- PHYS 122 General Physics II Laboratory (1 units)
Major Upper Division Selection 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)

Major Upper Division Selection Two
BIOL 482 Ecology (4 units)
BIOL 529GW Plant Ecology - GWAR (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)

Major Upper Division Taxonomy or Whole Organism Biology of an Invertebrate or Vertebrate
BIOL 460 General Entomology (4 units)
BIOL 461 Insect Taxonomy (4 units)
BIOL 464 Medical Entomology (3 units)
BIOL 475GW Herpetology - GWAR (3 units)
BIOL 478GW Ornithology - GWAR (4 units)
BIOL 555 Marine Invertebrate Zoology (4 units)
BIOL 570GW Biology of Fishes - GWAR (4 units)