# Bachelor of Science in Biology: Concentration in Physiology 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td></td>
<td></td>
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<tr>
<td>CHEM 115</td>
<td>General Chemistry I: Essential Concepts of Chemistry (Major Lower-Division Core)</td>
<td>5</td>
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<tr>
<td>ENG 114</td>
<td>Writing the First Year: Finding Your Voice (A2)</td>
<td>3</td>
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<tr>
<td>MATH 226</td>
<td>Calculus I (Major Lower-Division Core, B4)</td>
<td>4</td>
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<tr>
<td>GE Area A</td>
<td></td>
<td>3</td>
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<tr>
<td><strong>Units</strong></td>
<td></td>
<td>15</td>
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<tr>
<td><strong>Second Semester</strong></td>
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<tr>
<td>BIOL 230</td>
<td>Introductory Biology I (Major Lower-Division Core)</td>
<td>5</td>
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<tr>
<td>BIOL 231</td>
<td>Advising for Success as a Biology Major (Major Lower-Division Core)</td>
<td>1</td>
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<tr>
<td>CHEM 215</td>
<td>General Chemistry II: Quantitative Applications of Chemistry Concepts (Major Lower-Division Core)</td>
<td>3</td>
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<tr>
<td>GE Area A</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area E</td>
<td></td>
<td>3</td>
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<tr>
<td><strong>Units</strong></td>
<td></td>
<td>15</td>
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<tr>
<td><strong>Third Semester</strong></td>
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<tr>
<td>BIOL 240</td>
<td>Introductory Biology II (Major Lower-Division Core)</td>
<td>5</td>
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<tr>
<td>Select One (Major Lower-Division Core)</td>
<td>3</td>
<td></td>
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<tr>
<td>CHEM 130</td>
<td>General Organic Chemistry</td>
<td></td>
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<tr>
<td>CHEM 233</td>
<td>Organic Chemistry I</td>
<td></td>
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</tbody>
</table>

Select One Set of Courses (Major Lower-Division Core): 5  
**Units** 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 C  
**Units** 3

**Fourth Semester**  
Select One (Major Lower-Division Core): 4  
**Units** 3  
CHEM 335  
Organic Chemistry II

SF State Studies or University Elective (if CHEM 130 taken)  
Select One Set of Courses (Major Lower-Division Core): 5  
**Units** 4  
PHYS 121  
& PHYS 122  
General Physics II and General Physics II Laboratory

PHYS 230  
& PHYS 232  
General Physics with Calculus II and General Physics with Calculus II Laboratory

GE Area C - Take Two  
**Units** 6  
GE Area D  
**Units** 3

**Fifth Semester**  
Select One (Major Upper-Division Core)  
**Units** 3  
BIOL 355  
Genetics (Major Upper-Division Core)

BIOL 612  
Human Physiology

BIOL 630  
Animal Physiology

GE Area D  
**Units** 3  
GE Area F  
**Units** 3  
U.S. and California Government (http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg)

**Units** 3

**Sixth Semester**  
Select One (Major Upper-Division Core):  
**Units** 3  
CHEM 340  
Biochemistry I

CHEM 349  
General Biochemistry

GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course)  
**Units** 3  
SF State Studies or University Elective - Take Three  
**Units** 9

**Seventh Semester**  
Select One (Major Upper-Division Core): 3-4  
**Units** 3  
BIOL 337  
Evolution (Major Upper-Division Core)

BIOL 613GW  
Human Physiology Laboratory - GWAR

BIOL 631GW  
Animal Physiology Laboratory - GWAR

Major Upper-Division Electives (10 Units Total)  
**Units** 6
GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course)  
| Units | 15-16 |

**Eighth Semester**

| Major Upper-Division Electives (10 Units Total) | 6 |
| SF State Studies or University Elective – Take Three | 10 |

| Units | 14 |

**Total Units** 120-121

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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. 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. 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.

4. CHEM 233 is a prerequisite for CHEM 335. If students plan to take CHEM 335, they must take CHEM 233.

5. PHYS 111/PHYS 112 are prerequisites for PHYS 121/PHYS 122. PHYS 220/PHYS 222 are prerequisites for PHYS 230/PHYS 232.

6. **Guided Electives (10 units)**

   Select 10 units from the classes below; at least 6 units must be chosen from among the Group A courses.

   **Group A**
   - BIOL 328 Human Anatomy (4 units)
   - BIOL 350 Cell Biology (3 units)
   - BIOL 616 Cardiorespiratory Physiology (3 units)
   - BIOL 617 Environmental Physiology (3 units)
   - BIOL 618 Biology of Aging (3 units)
   - BIOL 620 Endocrinology (3 units)
   - BIOL 621 Reproductive Physiology (3 units)
   - BIOL 622 Hormones and Behavior (3 units)
   - BIOL 623 Pharmacology (3 units)
   - BIOL 640 Cellular Neurosciences (3 units)
   - BIOL 642 Neural Systems Physiology (3 units)

   **Group B**
   - BIOL 435 Immunology (3 units)
   - BIOL 453 General Parasitology (3 units)
   - BIOL 454 Parasitology Laboratory (1 unit)
   - BIOL 525 Plant Physiology (3 units)
   - BIOL 526 Plant Molecular Physiology Laboratory (2 units)
   - BIOL 615 Molecular Pathophysiology (3 units)
   - BIOL 644 LEADER 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 699 Independent Study in Biology (1-3 units)

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