# Bachelor of Science in Biology: Concentration in Physiology - Quantitative Reasoning Category III/IV and ENG 114

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

<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>
</tr>
<tr>
<td>BIOL 230</td>
<td>Introductory Biology I (Major Lower-Division Core)</td>
<td>5</td>
</tr>
<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 197</td>
<td>Prelude to Calculus I (Prerequisite for MATH 226)</td>
<td>3</td>
</tr>
<tr>
<td>GE Area A</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area C</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>17</td>
</tr>
<tr>
<td><strong>Second Semester</strong></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>MATH 198</td>
<td>Prelude to Calculus II (Prerequisite for MATH 226, B4)</td>
<td>3</td>
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<tr>
<td>GE Area A</td>
<td></td>
<td>3</td>
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<tr>
<td>GE Area D</td>
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<td>3</td>
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<tr>
<td>GE Area E</td>
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<tr>
<td><strong>Units</strong></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>
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<tr>
<td>CHEM 130</td>
<td>General Organic Chemistry (Major Lower-Division Core)</td>
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<tr>
<td>CHEM 215 &amp; CHEM 216</td>
<td>General Chemistry II: Quantitative Applications of Chemistry Concepts and General Chemistry II Laboratory: Quantitative Applications of Chemistry Concepts (Major Lower-Division Core)</td>
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<tr>
<td>MATH 226</td>
<td>Calculus I (Major Lower-Division Core, B4)</td>
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<tr>
<td><strong>Units</strong></td>
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<td>17</td>
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<tr>
<td><strong>Fourth Semester</strong></td>
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<tr>
<td>CHEM 233</td>
<td>Organic Chemistry I (Hidden Prerequisite for CHEM 335 and CHEM 340)</td>
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</tr>
<tr>
<td>Select One (Major Lower-Division Core):</td>
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<td>3-4</td>
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<tr>
<td>BIOL 358</td>
<td>Forensic Genetics: Math Matters</td>
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<tr>
<td>BIOL 458</td>
<td>Biometry</td>
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<tr>
<td>MATH 124</td>
<td>Elementary Statistics (B4)</td>
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<tr>
<td>MATH 227</td>
<td>Calculus II</td>
<td>5</td>
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<tr>
<td>Select One Set of Courses (Major Lower-Division Core):</td>
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<td>4</td>
</tr>
<tr>
<td>PHYS 111 &amp; PHYS 112</td>
<td>General Physics I and General Physics I Laboratory (B1, B3)</td>
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<tr>
<td>PHYS 220 &amp; PHYS 222</td>
<td>General Physics with Calculus I and General Physics with Calculus I Laboratory (B1, B3)</td>
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<tr>
<td>GE Area C</td>
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<tr>
<td><strong>Units</strong></td>
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<td>13-14</td>
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<tr>
<td><strong>Fifth Semester</strong></td>
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<tr>
<td>BIOL 355</td>
<td>Genetics (Major Upper-Division Core)</td>
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<tr>
<td>BIOL 612 or BIOL 630</td>
<td>Human Physiology (Major Physiology Core) or Animal Physiology</td>
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</tr>
<tr>
<td>CHEM 335</td>
<td>Organic Chemistry II (Hidden Prerequisite for CHEM 340 and CHEM 349)</td>
<td>3</td>
</tr>
<tr>
<td>Select One Set of Courses (Major Lower-Division Core):</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>PHYS 121 &amp; PHYS 122</td>
<td>General Physics II and General Physics II Laboratory</td>
<td></td>
</tr>
</tbody>
</table>
Bachelor of Science in Biology: Concentration in Physiology

Quantitative Reasoning Category III/IV and ENG 114

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

Students must take MATH 227 if taking PHYS 220/PHYS 222/PHYS 230/PHYS 232.

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

**Physiology Core Courses (9 units)**

- BIOL 525 Plant Physiology (3 units)
- BIOL 612 Human Physiology (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 630 Animal Physiology (3 units)
- BIOL 640 Cellular Neurosciences (3 units)
- BIOL 642 Neural Systems Physiology (3 units)

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

**Guided Electives (9-11 units)**

Select 9-11 units in consultation with an advisor from the following:

Criteria for elective units: one elective must contain a laboratory component, one elective must be chosen from each of the emphases listed below, and additional electives may be selected from the list of Physiology core courses and/or either of the emphases listed below.

**Cellular and Molecular**

- BIOL 351GW Experiments in Cell and Molecular Biology - GWAR (4 units)\(^8\)
- BIOL 357 Molecular Genetics (3 units)
- BIOL 382 Developmental Biology (3 units)
- BIOL 435 Immunology (3 units)
- BIOL 615 Molecular Pathophysiology (3 units)
- BIOL 623 Pharmacology (3 units)
- BIOL 652 Science Education Partners in Biology (4 units)
- BIOL 699 Independent Study in Biology (1-3 units)
- BIOL 865 Advances in Physiology and Behavioral Biology (2 units)
- CHEM 343 Biochemistry I Laboratory (3 units)

**Ecological, Anatomical, and Evolutionary**

- BIOL 328 Human Anatomy (4 units)
- BIOL 337 Evolution (3 units)
- BIOL 482 Ecology (4 units)
- BIOL 504 Biology of the Fungi (4 units)
- BIOL 505 Comparative Anatomy of Vascular Plants (4 units)
- BIOL 525 Plant Physiology (3 units)
- BIOL 526 Plant Molecular Physiology Laboratory (2 units)
- BIOL 529GW Plant Ecology - GWAR (4 units)\(^8\)
- BIOL 555 Marine Invertebrate Zoology (4 units)
- BIOL 570GW Biology of Fishes - GWAR (4 units)\(^8\)
- BIOL 585 Marine Ecology (3 units)
- BIOL 586 Marine Ecology Laboratory (2 units)
- BIOL 600 Animal Behavior (3 units)
- BIOL 614 Vertebrate Histology (4 units)
- BIOL 652 Science Education Partners in Biology (4 units)
- BIOL 699 Independent Study in Biology (1-3 units)
- BIOL 865 Advances in Physiology and Behavioral Biology (2 units)

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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. 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. Information regarding the courses that correspond with your MATH Pathway/Category can be found on the Developmental Studies Office Website.

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.