BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN PHYSIOLOGY – BIOL ASSOCIATE DEGREE FOR TRANSFER ROADMAP

This is a sample pathway for students who transfer to San Francisco State University in the current Bulletin year with an AS-T in Biology. Thirty-two units in the major (BIOL 230/BIOL 240, CHEM 115/CHEM 215/CHEM 216, MATH 226, required PHYS sequence) and 33 units of lower division GE requirements have been satisfied. Check with a major advisor about the most appropriate course sequence. Degree completion guaranteed in 60 units; see the Associate Degree for Transfer (ADT) section for more information (http://bulletin.sfsu.edu/undergraduate-admissions/transfer-students).

### Course Title and Units

#### First Semester
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 130</td>
<td>General Organic Chemistry</td>
<td>3</td>
</tr>
</tbody>
</table>

Select One:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 124</td>
<td>Elementary Statistics</td>
<td>4</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Calculus II</td>
<td></td>
</tr>
<tr>
<td>BIOL 358</td>
<td>Forensic Genetics: Math Matters</td>
<td></td>
</tr>
<tr>
<td>BIOL 458</td>
<td>Biometry</td>
<td></td>
</tr>
</tbody>
</table>

GE Area A: Written English Communication II (A4) 3
or University Elective if A4 met in transfer

US History (bulletin.sfsu.edu/past-bulletin-archive/2018-2019/undergraduate-education/graduation-requirements/#USHaGR)

or University Elective if US History met before transfer

GE Area C: Arts (C1) or Humanities (C2) or Humanities: Literature (C3) 3

Units 16

#### Second Semester
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 350</td>
<td>Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 355</td>
<td>Genetics</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 340/349</td>
<td>Biochemistry I or General Biochemistry</td>
<td>3</td>
</tr>
</tbody>
</table>

Upper Division GE: UD-C or UD-D 3

GE Area D: Social Sciences (D1) or U.S. History (D2) or U.S. and California Government (D3) 3

Units 15

#### Third Semester
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 612/630</td>
<td>Human Physiology or Animal Physiology</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units 60

1. Some GE Area UD–C: Upper Division Arts and/or Humanities courses also satisfy US History. Check the Class Schedule.
2. BIOL 355 satisfies GE Area UD–B: Upper Division Physical and/or Life Sciences.

<table>
<thead>
<tr>
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<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 613GW/631GW/526</td>
<td>Human Physiology Laboratory - GWAR or Animal Physiology Laboratory - GWAR or Plant Molecular Physiology Laboratory</td>
<td>3-4</td>
</tr>
</tbody>
</table>

Major Physiology Core – See List 3

Major Physiology Elective 4 3

Upper Division GE: UD-C or UD-D 3

Units 16

Fourth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 350</td>
<td>Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 355</td>
<td>Genetics</td>
<td>7-8</td>
</tr>
<tr>
<td>Upper Division GE: UD-C or UD-D</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or University Elective</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Units 13

Total Units 60
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)
- 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)
- BIOL 555 Marine Invertebrate Zoology (4 units)
- BIOL 570GW Biology of Fishes - GWAR (4 units)
- 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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**To Do at SF State:**

Enough total units to reach 120 minimum for graduation; 40 units minimum at the upper division level; to include the following:

**University-Wide Requirements: 12–21 Units**
- ENG 214 or equivalent A4 course (0-3 units) if not taken before transfer
- American Institutions (0-6 units): See next bullet.
- Lower division GE (6 units) – Area C (3 units in any subarea) and Area D (3 units; D2 satisfies US History if needed; D3 satisfies US/CA Government requirement if needed)
- Upper division GE (6 units to do): 1) Major course satisfies UD-B. 2) Take UD-C and UD-D courses. See notes.
- Students entering this major with the AS-T in Biology are not required to fulfill SF State Studies or Complementary Studies requirements.

**Biology – Physiology Major: 34–40 Units**

BIOL 230/BIOL 240, MATH 226, all PHYS, CHEM 115/CHEM 215/CHEM 216 met in transfer.

- Lower Division requirements (3–7 units): CHEM 130; MATH 124 or MATH 227 if not met in transfer (BIOL 358 or BIOL 458 may substitute for MATH 124 or MATH 227)

- Upper Division requirements (31–33 units); includes
  - Upper division requirements (9 units): BIOL 350, BIOL 355; CHEM 340 or CHEM 349
  - Physiology Core and Lab Requirements/GWAR (12–13 units)
  - Physiology Electives (10–11 units) – upon advisement. See note 4.

**University Electives: Zero Units or More**

Depends on course choices made at the community college, how transferred units are applied to the requirements above, and course choices at SF State - some courses may meet more than one requirement, e.g. both in UD GE and the major.