BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN PHYSIOLOGY – BIOL ASSOCIATE DEGREE FOR TRANSFER (ADT) 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/).

To Do at SF State:

Enough total units to reach 120 minimum for graduation; 30 units minimum at the upper-division level; to include the following:

University-Wide Requirements: 15 Units

- Lower-Division GE (6 units) – Area C (3 units in any subarea) and Area D (3 units).
- Upper-Division GE (9 units): Courses may satisfy both American Institutions and Upper-Division GE if approved for multiple areas.
- 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: 29–32 Units

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

- Lower-Division Requirements (4–7 units): Organic Chemistry sequence, BIOL 231
- Upper-Division Requirements (25 units); includes
  - Upper-division requirements (15 units): BIOL 355; BIOL 337; BIOL 612 or BIOL 630; BIOL 613GW or BIOL 631GW; CHEM 340 or CHEM 349
  - Physiology Electives (10 units) – upon advisement. See note 3.

University Electives: 16 or More Units

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.

Course | Title | Units
--- | --- | ---
First Semester
BIOL 231 | Advising for Success as a Biology Major (Major Lower-Division Core) | 1
Select One (Major Lower-Division Core): | | 3
CHEM 130 | General Organic Chemistry | 
CHEM 233 | Organic Chemistry I | 
US History [http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#USHaGR] | | 
or University Elective if US History met before transfer | | 
GE Area C | | 
GE Area D | | 
University Elective | | 
Units | 16

Second Semester
BIOL 355 | Genetics (Major Upper-Division Core) | 3
Select One (Major Upper-Division Core): | | 3
BIOL 612 | Human Physiology | 
BIOL 630 | Animal Physiology | 
Units | 16
Select One (Major Lower-Division Core):

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 335</td>
<td>Organic Chemistry II</td>
</tr>
</tbody>
</table>

SF State Studies or University Elective (if CHEM 130 taken)

Select One (Major Upper-Division Core):

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 340</td>
<td>Biochemistry I</td>
</tr>
<tr>
<td>CHEM 349</td>
<td>General Biochemistry</td>
</tr>
</tbody>
</table>

GE Area UD-C: Upper-Division Arts and/or Humanities

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
</tr>
</tbody>
</table>

**Third Semester**

BIOL 337 Evolution (Major Upper-Division Core) 3

Select One (Major Upper-Division Core):

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 613GW</td>
<td>Human Physiology Laboratory - GWAR</td>
</tr>
<tr>
<td>BIOL 631GW</td>
<td>Animal Physiology Laboratory - GWAR</td>
</tr>
</tbody>
</table>

Major Upper-Division Electives (10 Units Total) 3

GE Area UD-D: Upper-Division Social Sciences 3

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

**Fourth Semester**

Major Upper-Division Electives (10 Units Total) - Take Two 3

University Elective - Take Three 9

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

**Total Units** 60

---

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

2. BIOL 355 satisfies GE Area UD-B: Upper-Division Physical and/or Life Sciences.

3. **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 LEAderS Service Learning Course: Learners Engaged in Advocating for Diversity in Science (4 units)
   or BIOL 654 Peer Assistants for Learning Science (PALS) (4 units)
   - BIOL 699 Independent Study in Biology (1-3 units)