# Bachelor of Science in Biology: Concentration in Microbiology – 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.

### Course Title | Units
--- | ---
First Semester
CHEM 233 | Organic Chemistry I | 3
GE Area A: Written English Communication II (A4) | 3
or University Elective if A4 met in transfer
Major Lower Division Requirement – See List | 3-4
or University Elective if already satisfied
GE Area C: Arts (C1) or Humanities (C2) or Humanities: Literature (C3) | 3
US History (bulletin.sfsu.edu/undergraduate-education/graduation-requirements/#USHaGR) | 1-3
or University Elective if US History met before transfer

Units | 16

Second Semester
BIOL 401 & BIOL 402GW | General Microbiology and General Microbiology Laboratory - GWAR | 6
CHEM 335 | Organic Chemistry II | 3
GE Area D: Social Sciences (D1) or U.S. History (D2) or U.S. and California Government (D3) | 3
GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course) | 3

Units | 15

Third Semester
CHEM 340 or CHEM 349 | Biochemistry I or General Biochemistry | 3
BIOL 355 | Genetics | 3
Major Upper Division Elective – Take Two | 3
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course) | 3

Units | 15

Fourth Semester
BIOL 442 | Microbial Physiology | 3

---

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.
3. Select upper division electives in consultation with an advisor. Must include at least three lab courses.

### 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: 15–21 Units

- ENG 214 or equivalent A4 course (0–3 units) if not taken before transfer
- American Institutions (0–6 units): See 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 – Microbiology Major: 37 Units

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

- Lower Division requirements (7 units): CHEM 233; MATH 124, MATH 227, MATH 228 OR CSC 210 if not met in transfer
- Major Upper Division Requirements/GWAR (18 units)
- Major Upper Division Electives (12 units) – upon advisement. See note 1.

#### University Electives: Two 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. in both UD GE and the major.

#### Major Lower Division Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 124</td>
<td>Elementary Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 228</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>CSC 210</td>
<td>Introduction to Computer Programming</td>
<td>3</td>
</tr>
</tbody>
</table>