BACHELOR OF ARTS IN BIOLOGY – 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 Units
#### First Semester
CHEM 130 General Organic Chemistry (OR) 3
CHEM 233 Organic Chemistry I Major Upper Division Requirement – Select Any BIOL GWAR Course 3-4
GE Area A: Written English Communication II (A4) or University Elective if A4 met in transfer 3
US History (bulletin.sfsu.edu/undergraduate-education/graduation-requirements/#USHaGR) or University Elective if US History met before transfer 3
GE Area C: Arts (C1) or Humanities (C2) or Humanities: Literature (C3) 3

**Units** 15

#### Second Semester
BIOL 355 Genetics 3
Major Upper Division Requirement – Select Physiology Course – See List 3
Major Upper Division Requirement – Select Physiology Lab OR Upper Division Elective 2-3
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
Major Upper Division Requirement – Select Cell Biology Course – See List 3
Major Upper Division Requirement – Select Cell Biology Lab OR Upper Division Elective 2-4
Major Upper Division Requirement – Select Ecology Course 3-4
Upper Division GE: UD-C or UD-D 3
University Elective 1-4

**Units** 15

#### Fourth Semester
Major Upper Division Requirement – Evolutionary or Organismal Biology Course 3-5
Major Upper Division Elective 2-4
University Elective or UD-C or UD-D if needed 3
University Electives 3-7

**Units** 15

Total Units 60

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1. If ENG 214 equivalent not taken before transfer, take GWAR course in a subsequent semester. Biology B.A. students may take any BIOL GWAR course; view all BIOL GWAR course options at http://biology.sfsu.edu/content/gwar
2. Some UD-C courses also satisfy US History - check Class Schedule
3. BIOL 355 satisfies UD GE (B)
4. Laboratory Course Associated with a Course in the Physiology or Cell Biology Course

- BIOL 351GW Experiments in Cell and Molecular Biology - GWAR (4 units)
- BIOL 402GW General Microbiology Laboratory - GWAR (3 units)
- BIOL 436 Immunology Laboratory (2 units)
- BIOL 443 Microbial Physiology Laboratory (2 units)
- BIOL 454 Parasitology Laboratory (1 units)
- BIOL 526 Plant Molecular Physiology Laboratory (2 units)
- BIOL 613GW Human Physiology Laboratory - GWAR (3 units)
- BIOL 631GW Animal Physiology Laboratory - GWAR (4 units)
### Ecology Courses
- BIOL 482 Ecology (4 units)
- BIOL 490 Ecology of Infectious Diseases (4 units)
- BIOL 529GW Plant Ecology - GWAR (4 units)
- BIOL 532 Restoration Ecology (3 units)
- BIOL 534 Wetland Ecology (4 units)
- BIOL 580 Limnology (3 units)
- BIOL 582 Biological Oceanography (4 units)
- BIOL 585 Marine Ecology (3 units)
- BIOL 586 Marine Ecology Laboratory (2 units)

### Cell Biology Courses
- BIOL 350 Cell Biology (3 units)
- BIOL 358 Forensic Genetics: Math Matters (4 units)
- BIOL 401 General Microbiology (3 units)
- BIOL 435 Immunology (3 units)
- BIOL 453 General Parasitology (3 units)
- CHEM 349 General Biochemistry (3 units)

### Physiology Courses
- BIOL 442 Microbial Physiology (3 units)
- BIOL 525 Plant Physiology (3 units)
- BIOL 612 Human Physiology (3 units)
- BIOL 630 Animal Physiology (3 units)

### Evolutionary or Organismal Biology Courses
- BIOL 328 Human Anatomy (4 units)
- BIOL 337 Evolution (3 units)
- BIOL 380 Evolutionary Developmental Biology (3 units)
- BIOL 382 Developmental Biology (3 units)
- BIOL 425 Emerging Diseases (3 units)
- BIOL 453 General Parasitology (3 units)
- BIOL 454 Parasitology Laboratory (1 units)
- BIOL 460 General Entomology (4 units)
- BIOL 475GW Herpetology - GWAR (3 units)
- BIOL 478GW Ornithology - GWAR (4 units)
- BIOL 500 Evolution and Diversity of Plants (4 units)
- BIOL 502 Biology of the Algae (3 units)
- BIOL 504 Biology of the Fungi (4 units)
- BIOL 505 Comparative Anatomy of Vascular Plants (4 units)
- BIOL 514 Plant Taxonomy (5 units)
- BIOL 555 Marine Invertebrate Zoology (4 units)
- BIOL 570GW Biology of Fishes - GWAR (4 units)
- BIOL 600 Animal Behavior (3 units)
- BIOL 638 Bioinformatics & Genome Annotation (4 units)

### To Do at SF State:

**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 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.

**General Biology Major: 24-33 Units**
- BIOL 230/BIOL 240, MATH 226, all PHYS, CHEM 115/CHEM 215/ CHEM 216 met in transfer.
- Lower Division requirements (3 units): CHEM 130 or CHEM 233
- Major Upper-Division Requirements/GWAR (17-22 units)
- Major Upper-Division Electives (4-8 units)

**University Electives: Four 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. Upper-division electives recommended in order to meet the minimum 40-unit requirement.

**Major Upper-Division requirement – Select Physiology Course**

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<tr>
<th>Code</th>
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<tr>
<td>BIOL 442</td>
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<tr>
<td>BIOL 525</td>
<td>Plant Physiology</td>
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<td>BIOL 612</td>
<td>Human Physiology</td>
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</tr>
<tr>
<td>BIOL 630</td>
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**Major Upper-Division requirement – Select Cell Biology Course**

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<tr>
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<td>BIOL 401</td>
<td>General Microbiology</td>
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</tr>
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<td>BIOL 435</td>
<td>Immunology</td>
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</tr>
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<td>General Parasitology</td>
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**B.A. Biology students satisfy Complementary Studies by taking courses in chemistry, physics and mathematics that are required for the major.**