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 | Units
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**First Semester**
CHEM 130 | General Organic Chemistry | 3

Select One:
- MATH 124 | Elementary Statistics | 3-4
- MATH 227 | Calculus II | 3
- BIOL 358 | Forensic Genetics: Math Matters | 3
- BIOL 458 | Biometry | 3
- 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 | 16

**Second Semester**
BIOL 350 | Cell Biology | 3
BIOL 355 | Genetics | 3
CHEM 340 or CHEM 349 | Biochemistry I or General Biochemistry | 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**
BIOL 612 or BIOL 630 | Human Physiology or Animal Physiology | 3

| Major Physiology Core – See List | 3 |
| Major Physiology Elective | 3 |
| Upper Division GE: UD-C or UD-D | 3 |

Units | 16

**Fourth Semester**
Major Physiology Core – See List | 3
Major Physiology Electives | 7-8
Upper Division GE: UD-C or UD-D or University Elective | 3

Units | 13

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.
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)

**ECHE 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)

**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.