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 A.S.-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 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) 3
or University Elective if A4 met in transfer 3
US History (bulletin.sfsu.edu/undergraduate-education/graduation-requirements/#USHaGR) 3
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 Biochemistry I or General Biochemistry 3
or CHEM 349
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 Human Physiology or Animal Physiology 3
or BIOL 630
BIOL 613GW or BIOL 631GW or BIOL 526 Human Physiology Laboratory – GWAR or Animal Physiology Laboratory – GWAR or Plant Molecular Physiology Laboratory 3-4
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)
- 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)

**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.