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 (Major Lower-Division) 3

**Select One (Major Lower-Division):** | 3-4
MATH 124 | Elementary Statistics (B4) 3
MATH 227 | Calculus II 3
BIOL 358 | Forensic Genetics: Math Matters 3
BIOL 458 | Biometry 3
US History (bulletin.sfsu.edu/undergraduate-education/graduation-requirements/#USHaGR) or University Elective if US History met before transfer 3
GE Area C 3
GE Area D 3

**Units** | 16

**Second Semester**
BIOL 350 | Cell Biology (Major Upper-Division) 3
BIOL 355 | Genetics (Major Upper-Division) 1

BIOL 612 or BIOL 630 | Human Physiology (Major Physiology Core) or Animal Physiology 3

CHEM 340 or CHEM 349 | Biochemistry I (Major Upper-Division) or General Biochemistry 3

GE Area UD-C: Upper-Division Arts and/or Humanities 3

**Units** | 15

**Third Semester**
Select One (Physiology Lab): | 2-4
BIOL 526 | Plant Molecular Physiology Laboratory
BIOL 613GW | Human Physiology Laboratory - GWAR 2
BIOL 631GW | Animal Physiology Laboratory - GWAR 2

Physiology Core Courses (6 Units Total) - Take One 3
Major Upper-Division Electives (9-11 Units Total) - Take One 4
GE Area UD-D: Upper-Division Social Sciences 3
University Elective 3

**Units** | 16

**Fourth Semester**
Physiology Core Courses (6 Units Total) - Take One 3
Major Upper-Division Electives (9-11 Units Total) - Take Two 4
University Elective 3

**Units** | 13

**Total Units** | 60

1. BIOL 355 satisfies GE Area UD-B: Upper-Division Physical and/or Life Sciences.
2. Students must complete at least one GWAR course in order to graduate.
3. Physiology Core Courses (9 units)
Select nine units from the following (one lecture must be BIOL 612 or BIOL 630)
BIOL 525 Plant Physiology (3 units)
BIOL 612 Human Physiology (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 630 Animal Physiology (3 units)
BIOL 640 Cellular Neurosciences (3 units)
BIOL 642 Neural Systems Physiology (3 units)
Guided Electives (9–11 units)
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 areas 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)

**University Electives: 3 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.

**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 Units**
- Lower-Division GE (6 units) – Area C (3 units in any subarea) and Area D (3 units). D2 courses also satisfy US History; D3 courses also satisfy US/CA Government.
- 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: 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)