BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN MARINE BIOLOGY AND LIMNOLOGY – 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**
BIOL 570GW | Biology of Fishes - GWAR | 4
CHEM 130 | General Organic Chemistry | 3
GE Area A: Written English Communication II (A4) | 3
GE Area C: Arts (C1) or Humanities (C2) or Humanities: Literature (C3) | 3
US History (bulletin.sfsu.edu/undergraduate-education/graduation-requirements/#USHaGR) | 3
or University Elective if US History met before transfer | Units 16

**Second Semester**
BIOL 355 | Genetics | 3
BIOL 458 | Biometry | 4
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
University Elective | 1
**Units** | 14

**Third Semester**
BIOL 337 | Evolution | 3
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course) | 3
Select 3-5 units on advisement: | 3-5
 unlink
BIOL 534 | Wetland Ecology | 1
BIOL 580 | Limnology | 1
BIOL 582 | Biological Oceanography | 1

**Fourth Semester**
University Elective | 3
or University Elective if US History met before transfer | Units 13
**Total Units** | 60

1. If ENG 214 equivalent not taken before transfer, take this course or BIOL 631GW course in a subsequent semester (note that BIOL 630 must be taken before or concurrently with BIOL 631GW). While completion in 60 units is still possible, progress to degree will be extended.

2. Some GE Area UD–C: Upper Division Arts and/or Humanities courses also satisfy US History. Check the Class Schedule.

3. BIOL 355 satisfies GE Area UD–B: Upper Division Physical and/or Life Sciences.

4. **Upper Division Electives (14-17 units)**
   - BIOL 502 Biology of the Algae (3 units)
   - BIOL 526 Plant Molecular Physiology Laboratory (2 units)
   - BIOL 532 Restoration Ecology (3 units)
   - BIOL 555 Marine Invertebrate Zoology (4 units)
   - BIOL 556 Natural History of Marine Invertebrates (4 units)
   - BIOL 570GW Biology of Fishes - GWAR (4 units)
   - BIOL 575 Fisheries Biology (3 units)
   - BIOL 584 Marine Microrganism Ecology Laboratory (1 units)
   - BIOL 586 Marine Ecology Laboratory (2 units)
   - BIOL 631GW Animal Physiology Laboratory - GWAR (4 units)
   - CHEM 680 Chemical Oceanography (3 units)
   - ERTH 434 Coastal Processes (3 units)
   - ERTH 642 Watershed Assessment and Restoration (4 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: 15–21 Units**

- ENG 214 or equivalent A4 course (0–3 units) if not taken before transfer. See note 1.
- 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 – Marine Biology and Limnology Major: 36–37 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
• Major Upper Division Requirements (16–17 units)
• Major Upper Division Electives – includes GWAR (17 units) – upon advisement.

University Electives: One Unit 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.