

BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN MICROBIOLOGY – 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.

Course	Title	Units
First Semester		
CHEM 233	Organic Chemistry I (Major Lower-Division Core)	3
Major Lower-Division Requirement ¹ or University Elective if already satisfied		3-4
GE Area C		3
US History or University Elective if US History met before transfer		3
University Elective		3
	Units	16
Second Semester		
BIOL 401 & BIOL 402GW	General Microbiology and General Microbiology Laboratory - GWAR (Major Upper-Division Core)	6
CHEM 335	Organic Chemistry II (Major Upper-Division Core)	3
GE Area D		3
GE Area UD-C: Upper-Division Arts and/or Humanities		3
	Units	15
Third Semester		
BIOL 355	Genetics (Major Upper-Division Core) ²	3
CHEM 340 or CHEM 349	Biochemistry I (Major Upper-Division Core) or General Biochemistry	3
Major Upper-Division Elective (12 units) – Take Two ³		6
GE Area UD-D: Upper-Division Social Sciences		3
	Units	15
Fourth Semester		
BIOL 442	Microbial Physiology (Major Upper-Division Core)	3
Major Upper-Division Elective (12 units) – Take Two ³		6
University Elective - Take Two		5
	Units	14
	Total Units	60

1 Major Lower-Division Requirement

Select 3–4 units from the following:

BIOL 358 Forensic Genetics: Math Matters (4 units)

BIOL 458 Biometry (4 units)

CSC 210 Introduction to Computer Programming (3 units)

MATH 124 Elementary Statistics (3 units) (B4)

MATH 227 Calculus II (4 units)

MATH 228 Calculus III (4 units)

2 BIOL 355 satisfies GE Area UD–B.

3 Electives in Microbiology - 12 units

Select 12 units from the following courses, including at least three laboratory courses with approval of an advisor. Any course taken as an elective that does not appear on this list will not be counted towards completion of the Microbiology degree requirements unless the course is approved by an advisor prior to enrolling in it.

BIOL 351GW Experiments in Cell and Molecular Biology - GVAR (4 units)

BIOL 420 General Virology (3 units)

BIOL 425 Emerging Diseases (3 units)

BIOL 430 Medical Microbiology (3 units)

BIOL 431 Medical Microbiology Laboratory (2 units)

BIOL 435 Immunology (3 units)

BIOL 436 Immunology Laboratory (2 units)

BIOL 443 Microbial Physiology Laboratory (2 units)

BIOL 446 Microbial Genomics (4 units)

BIOL 453 General Parasitology (3 units)

BIOL 454 Parasitology Laboratory (1 unit)

BIOL 490 Ecology of Infectious Diseases (4 units)

BIOL 625 Hematology (3 units)

BIOL 638 Bioinformatics and Genome Annotation (4 units)

BIOL 699 Independent Study in Biology (1-3 units)

BIOL 741/CHEM 741/ERTH 741 Electron Microscopy (4 units)

CHEM 336 Organic Chemistry II Laboratory (2 units)

or CHEM 343 Biochemistry I Laboratory (3 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: 11–21 Units

- American Institutions (0-6 units): US History, US Government, CA Government. If not met in transfer, see next bullets.
- Lower-Division GE (6 units) – Area C (3 units in any subarea) and Area D (3 units). D2 courses satisfy US History; D3 courses satisfy US/CA Government requirements.
- Upper-Division GE (9 units): Courses may satisfy the US History or US/CA Government requirements, and UD-C or UD-D at the same time, 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 – Microbiology Major: 37-38 Units

BIOL 230/BIOL 240, MATH 226, all PHYS, CHEM 115/CHEM 215/CHEM 216 met in transfer.

- Lower-Division Requirements (7-8 units): CHEM 233; MATH 124, MATH 227, MATH 228, BIOL 358, BIOL 458, OR CSC 210 if not met in transfer.
- Major Upper-Division Requirements/GVAR (18 units)
- Major Upper-Division Electives (12 units) – upon advisement. See Note 3.

University Electives: 8 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. in both UD GE and the major.