BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN MICROBIOLOGY – BIOL ASSOCIATE DEGREE FOR TRANSFER (ADT) 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, and the 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/).**

To Do at SF State:

Enough total units to reach 120 minimum for graduation; 30 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 the next bullets.
- Lower-Division GE (6 units) – Area C (3 units in any subarea) and Area D (3 units).
- 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: 30-33 Units

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

- Lower-Division Requirements (4-7 units): Organic Chemistry sequence, BIOL 231
- Major Upper-Division Requirements/GWAR (15 units)
- Major Upper-Division Electives (11 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.

Course	Title	Units
First Semester		
BIOL 231	Advising for Success as a Biology Major (Major Lower-Division Core)	1
Select One (Major Lower-Division Core): [1]		3
CHEM 130	General Organic Chemistry	
CHEM 233	Organic Chemistry I	
US History (http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#USHaGR)		3
or University Elective if US History met before transfer		
GE Area C		3
GE Area D		3
University Elective		3
	Units	**16**
Second Semester		
BIOL 355	Genetics (Major Upper-Division Core) [2]	3

BIOL 401 & BIOL 402GW	General Microbiology and General Microbiology Laboratory - GWAR (Major Upper-Division Core)	6
Select One (Major Lower-Division Core): [1]		3
CHEM 335	Organic Chemistry II	
SF State Studies or University Elective (if CHEM 130 taken)		
Select One (Major Upper-Division Core):		3
CHEM 340	Biochemistry I	
CHEM 349	General Biochemistry	
	Units	**15**
Third Semester		
BIOL 337	Evolution (Major Upper-Division Core)	3
Major Upper-Division Electives (11 Units Total) [3]		5
GE Area UD-C: Upper-Division Arts and/or Humanities		3
GE Area UD-D: Upper-Division Social Sciences		3
	Units	**14**
Fourth Semester		
Major Upper-Division Electives (11 Units Total) - Take Two [3]		6
University Elective - Take Three		9
	Units	**15**
	Total Units	**60**

1 CHEM 233 is a prerequisite for CHEM 335. If students plan to take CHEM 335, they must take CHEM 233.

2 BIOL 355 satisfies GE Area UD–B.

3 **Electives in Microbiology**

Select 11 units from the following courses, including at least two laboratory courses. Consult an advisor to select electives that best align with your interests and future career goals. Any course taken as an elective that does not appear on this list will not be counted towards the completion of the Microbiology degree requirements unless it is approved by an advisor prior to enrolling in the course. Students who intend to apply for admission to Clinical Laboratory Science programs after graduation are strongly advised to speak with a Microbiology advisor for help in choosing their elective classes.

BIOL 420 General Virology (3 units)
BIOL 425 Emerging Diseases (3 units)
BIOL 430 Medical Microbiology (3 units)
BIOL 435 Immunology (3 units)
BIOL 442 Microbial Physiology (3 units)
BIOL 446 Microbial Genomics (4 units)
BIOL 453 General Parasitology (3 units)
BIOL 490 Ecology of Infectious Diseases (4 units)
BIOL 638 Bioinformatics and Sequence Analysis (4 units)
BIOL 644 LEADerS Service Learning Course: Learners Engaged in Advocating for Diversity in Science (4 units)
Select two laboratory courses from the following:
BIOL 431 Medical Microbiology Laboratory (2 units)
BIOL 436 Immunology Laboratory (2 units)
BIOL 443 Microbial Physiology Laboratory (2 units)
BIOL 454 Parasitology Laboratory (1 unit)
BIOL 625 Hematology (3 units)
BIOL 699 Independent Study in Biology (1-3 units)
CHEM 343 Biochemistry I Laboratory (3 units)
or CHEM 336 Organic Chemistry II Laboratory (2 units)