

BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN MICROBIOLOGY ROADMAP – QUANTITATIVE REASONING CATEGORY III/IV

120 Total Units Required

Minimum Number of Units in the Major: 60

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult your Degree Planner (<https://registrar.sfsu.edu/degreeplanner/>) and an advisor for further guidance.

To avoid taking additional units, it is recommended that you meet the SF State Studies (AERM, GP, ES, SJ) requirements within your GE or major.

| Course | Title | Units |
|--|---|-----------|
| First Semester | | |
| MATH 197 | Prelude to Calculus I (Prerequisite for MATH 226) ¹ | 3 |
| GE Area 1A: English Composition ² | | 3 |
| GE Area 1: English Communication | | 3 |
| GE Area 3: Arts and Humanities | | 3 |
| GE Area 4: Social and Behavioral Sciences ³ | | 3 |
| Units | | 15 |
| Second Semester | | |
| BIOL 230 | Introductory Biology I (Major Lower-Division Core) | 5 |
| BIOL 231 | Advising for Success as a Biology Major (Major Lower-Division Core) | 1 |
| CHEM 115 | General Chemistry I (Major Lower-Division Core) | 4 |
| MATH 198 | Prelude to Calculus II (Prerequisite for MATH 226, GE 2) ¹ | 3 |
| GE Area 1: English Communication | | 3 |
| Units | | 16 |
| Third Semester | | |
| BIOL 240 | Introductory Biology II (Major Lower-Division Core) ⁴ | 5 |
| CHEM 215 | General Chemistry II (Major Lower-Division Core) | 4 |

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| MATH 226 | Calculus I (Major Lower-Division Core, GE 2) ¹ | 4 |
| Units | | 13 |
| Fourth Semester | | |
| Select One (Major Lower-Division Core): ⁵ | | 3 |
| CHEM 130 | General Organic Chemistry | |
| CHEM 233 | Organic Chemistry I | |
| PHYS 111 & PHYS 112 | General Physics I and General Physics I Laboratory (Major Lower-Division Core, GE 5A, GE 5C) | 4 |
| GE Area 3: Arts and Humanities | | 3 |
| GE Area 4: Social and Behavioral Sciences ³ | | 3 |
| SF State Studies or University Elective | | 3 |
| Units | | 16 |
| Fifth Semester | | |
| BIOL 355 | Genetics (Major Upper-Division Core) ⁶ | 3 |
| BIOL 401 & BIOL 402GW | General Microbiology and General Microbiology Laboratory - GVAR (Major Upper-Division Core) | 6 |
| Select One (Major Lower-Division Core): ⁵ | | 3 |
| CHEM 235 | Organic Chemistry II (if CHEM 233 taken) | |
| SF State Studies or University Elective (if CHEM 130 taken) | | |
| PHYS 121 & PHYS 122 | General Physics II and General Physics II Laboratory (Major Lower-Division Core) | 4 |
| Units | | 16 |
| Sixth Semester | | |
| Select One (Major Upper-Division Core): | | 3 |
| CHEM 340 | Biochemistry I | |
| CHEM 349 | General Biochemistry | |
| GE Area 4UD: Upper-Division Social and Behavioral Sciences | | 3 |
| U.S. and California Government (https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg) | | 3 |
| SF State Studies or University Elective - Take Two | | 6 |
| Units | | 15 |
| Seventh Semester | | |
| BIOL 337 | Evolution (Major Upper-Division Core) | 3 |
| Major Upper-Division Electives (11 Units Total) ⁷ | | 6 |
| GE Area 3UD: Upper-Division Arts or Humanities | | 3 |
| SF State Studies or University Elective | | 3 |
| Units | | 15 |

Eighth Semester

| | |
|--|------------|
| Major Upper-Division Electives (11 Units Total) ⁷ | 5 |
| SF State Studies or University Elective – Take Three | 9 |
| Units | 14 |
| Total Units | 120 |

¹ Students should use their Pathway/Category (<https://gatorsmartstart.sfsu.edu/pathways/>) to determine the appropriate GE 2 course option. For directions on how to view your Pathway/Category, visit how to find your pathway (<https://gatorsmartstart.sfsu.edu/howtofindyourpathways/>). Questions? Contact Gator Smart Start. (<https://gatorsmartstart.sfsu.edu/>)

² Students should use their Pathway/Category (<https://gatorsmartstart.sfsu.edu/pathways/>) to determine the appropriate GE 1A course option. For directions on how to view your Pathway/Category, visit how to find your pathway (<https://gatorsmartstart.sfsu.edu/howtofindyourpathways/>). Questions? Contact Gator Smart Start. (<https://gatorsmartstart.sfsu.edu/>)

³ First-time freshmen must take one lower-division Area 4 course that meets US History (USH).

⁴ GE Area 5B (Biological Science) is satisfied upon completion of BIOL 240.

⁵ CHEM 233 is a prerequisite for CHEM 235. If students plan to take CHEM 235, they must take CHEM 233.

⁶ Area 5UD (Upper-Division Science) is satisfied upon completion of BIOL 355.

⁷ **Major Electives (11 units)**

A full list of courses that can fulfill this requirement can be found in the Degree Requirements (<https://bulletin.sfsu.edu/colleges/science-engineering/biology/bs-biology-concentration-microbiology/#degree requirements text>).