

# BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN CELL AND MOLECULAR BIOLOGY ROADMAP – QUANTITATIVE REASONING CATEGORY III/IV

120 Total Units Required

Minimum Number of Units in Major: 58

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
<b>First Semester</b>		
BIOL 230	Introductory Biology I (Major Lower-Division Core)	5
BIOL 231	Advising for Success as a Biology Major (Major Lower-Division Core)	1
MATH 197	Prelude to Calculus I (Prerequisite for MATH 226) <sup>1</sup>	3
GE Area 1A: English Composition <sup>2</sup>		3
GE Area 1: English Communication		3
<b>Units</b>		<b>15</b>
<b>Second Semester</b>		
BIOL 240	Introductory Biology II (Major Lower-Division Core) <sup>3</sup>	5
CHEM 115	General Chemistry I (Major Lower-Division Core)	4
MATH 198	Prelude to Calculus II (Major Lower-Division Core, GE 2) <sup>1</sup>	3
GE Area 1: English Communication		3
<b>Units</b>		<b>15</b>
<b>Third Semester</b>		
CHEM 215	General Chemistry II (Major Lower-Division Core)	4
MATH 226	Calculus I (Major Lower-Division Core, GE 2) <sup>1</sup>	4

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
<b>Units</b>		<b>15</b>
<b>Fourth Semester</b>		
Select One (Major Lower-Division Core): <sup>4</sup>		3
CHEM 130	General Organic Chemistry	
CHEM 233	Organic Chemistry I	
GE Area 3: Arts and Humanities		3
GE Area 4: Social and Behavioral Sciences - Take Two <sup>5</sup>		6
SF State Studies or University Elective		3
<b>Units</b>		<b>15</b>
<b>Fifth Semester</b>		
BIOL 355	Genetics (Major Upper-Division Core) <sup>6</sup>	3
Select One (Major Lower-Division Core): <sup>4</sup>		3
CHEM 235	Organic Chemistry II	
SF State Studies or University Elective (if CHEM 130 taken)		
GE Area 6: Ethnic Studies ( <a href="https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/">https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/</a> )		3
U.S. and California Government ( <a href="https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg">https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg</a> )		3
SF State Studies or University Elective		3
<b>Units</b>		<b>15</b>
<b>Sixth Semester</b>		
BIOL 337	Evolution (Major Upper-Division Core)	3
BIOL 350	Cell Biology (Major Upper-Division Core)	3
Select One (Major Upper-Division Core):		3
CHEM 340	Biochemistry I	
CHEM 349	General Biochemistry	
GE Area 3UD: Upper-Division Arts or Humanities		3
GE Area 4UD: Upper-Division Social and Behavioral Sciences		3
<b>Units</b>		<b>15</b>
<b>Seventh Semester</b>		
BIOL 351GW & BIOL 351	Experiments in Cell and Molecular Biology - GVAR and Experiments in Cell and Molecular Biology Discussion (Major Upper-Division Core)	4
BIOL 357	Molecular Genetics (Major Upper-Division Core)	3
Select Major Electives Requirement (9 Units Total) - Take Two <sup>7</sup>		6
SF State Studies or University Elective		3
<b>Units</b>		<b>16</b>

**Eighth Semester**

Select Major Electives Requirement (9 Units Total) <sup>7</sup>	3
SF State Studies or University Elective – Take Four	11
<b>Units</b>	<b>14</b>
<b>Total Units</b>	<b>120</b>

<sup>1</sup> 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/>)

<sup>2</sup> 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/>)

<sup>3</sup> GE Area 5B (Life Science) is satisfied upon completion of BIOL 240.

<sup>4</sup> CHEM 233 is a prerequisite for CHEM 235. If students plan to take CHEM 235, they must take CHEM 233.

<sup>5</sup> First-time freshmen must take one lower-division Area 4 course that meets US History (USH).

<sup>6</sup> [Area 5UD \(Upper-Division Science\)](#) is satisfied upon completion of BIOL 355.

<sup>7</sup> **Major Electives (9 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-cell-molecular-biology/#degreerequirements>).