BACHELOR OF SCIENCE IN CHEMISTRY ROADMAP - QUANTITATIVE REASONING CATEGORY III/IV

120 Total Units Required
Minimum Number of Units in the Major: 71

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 1: English Communication		3
GE Area 1A: English Composition [2]		3
GE Area 3: Arts and Humanities		3
GE Area 5B: Biological Science		3
	Units	**15**
Second Semester		
CHEM 115	General Chemistry I (Major Lower-Division)	4
MATH 198	Prelude to Calculus II (Prerequisite for MATH 226, GE 2) [1]	3
GE Area 1: English Communication		3
GE Area 4: Social and Behavioral Sciences [3]		3
	Units	**13**
Third Semester		
MATH 226	Calculus I (Major Lower-Division) [1]	4
CHEM 215	General Chemistry II (Major Lower-Division)	4
GE Area 3: Arts and Humanities		3
GE Area 4: Social and Behavioral Sciences [3]		3
	Units	**14**
Fourth Semester		
MATH 227	Calculus II (Major Lower-Division)	4
CHEM 233 & CHEM 234	Organic Chemistry I and Organic Chemistry I Laboratory (Major Lower-Division)	5
Select One (Major Lower-Division, GE 5A, GE 5C):		4
PHYS 111 & PHYS 112	General Physics I and General Physics I Laboratory	
PHYS 220 & PHYS 222	General Physics with Calculus I and General Physics with Calculus I Laboratory	
GE Area 6: Ethnic Studies (https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/)		3
	Units	**16**

Fifth Semester		
CHEM 235 & CHEM 236	Organic Chemistry II and Organic Chemistry II Laboratory (Major Lower-Division)	5
CHEM 321 & CHEM 322	Quantitative Chemical Analysis and Quantitative Chemical Analysis Laboratory (Major Upper-Division)	5
Select One (Major Lower-Division):		4
PHYS 121 & PHYS 122	General Physics II and General Physics II Laboratory	
PHYS 230 & PHYS 232	General Physics with Calculus II and General Physics with Calculus II Laboratory	
	Units	**14**
Sixth Semester		
CHEM 325	Inorganic Chemistry (Major Upper-Division)	3
CHEM 353	Physical Chemistry II: Quantum Chemistry and Spectroscopy (Major Upper-Division)	3
CHEM 390GW	Contemporary Chemistry and Biochemistry Research - GWAR (Major Upper-Division)	3
GE Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts		3
U.S. and California Government (https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg)		3
	Units	**15**
Seventh Semester		
CHEM 251	Mathematics and Physics for Chemistry (Major Lower-Division)	3
CHEM 340	Biochemistry I (Major Upper-Division)	3
CHEM 351	Physical Chemistry I: Thermodynamics and Kinetics (MAjor Upper-Division)	3
Upper-Division Major Elective (9 Units) [5]		3
GE Area 3UD: Upper-Division Arts or Humanities		3
	Units	**15**
Eighth Semester		
CHEM 426	Advanced Inorganic Chemistry Laboratory (Major Upper-Division)	2
Upper-Division Major Elective (9 Units) – Take Two [5]		6
GE Area 4UD: Upper-Division Social and Behavioral Sciences		3
SF State Studies or University Elective		4
	Units	**15**
Ninth Semester		
CHEM 451	Experimental Physical Chemistry with Laboratory (Major Upper-Division)	3
	Units	**3**
	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 Students may substitute CHEM 343 for CHEM 426 or CHEM 451 upon prior approval of advisor. If CHEM 343 is used as a substitute, it can not also be used as an elective.

5 **Major Electives (9 units minimum)**

A full list of courses that can fulfill this requirement can be found in the Degree Requirements (https://bulletin.sfsu.edu/colleges/science-engineering/chemistry-biochemistry/bs-chemistry/#degreerequirementstext).