BACHELOR OF ARTS IN CHEMISTRY ROADMAP – QUANTITATIVE REASONING CATEGORY 1/2

120 Total Units Required

Minimum Number of Units in the Major. 54

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, ESCA, SJ) requirements within your GE or major.

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Course	Title	Units
First Semester		
CHEM 115	General Chemistry I (Major Lower-Division)	4
MATH 226	Calculus I (Major Lower-Division, GE 2) ¹	4
GE Area 1: English Communication - Take Two		6
	Units	14
Second Semester		
CHEM 215	General Chemistry II (Major Lower-Division)	4
MATH 227	Calculus II (Major Lower-Division)	4
Select One Set of Courses (Major Lower-Division, GE 5A, GE 5C): ²		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 1A: English Composition ³		3
	Units	15
Third Semester		
CHEM 233 & CHEM 234	Organic Chemistry I and Organic Chemistry I Laboratory (Major Lower-Division)	5
CHEM 321 & CHEM 322	Quantitative Chemical Analysis and Quantitative Chemical Analysis Laboratory (Major Upper-Division)	5
GE Area 3: Arts and Humanities		3
GE Area 4: Social and Behavioral Sciences ⁴		3
	Units	16
Fourth Semester		
CHEM 235 & CHEM 236	Organic Chemistry II and Organic Chemistry II Laboratory (Major Lower-Division)	5
Select One Set of Courses (Major Lower-Division): ²	,	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	

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8 PHYS 242 and General Physics with Calculus III Laboratory GE Area 3: Arts and Humanities 3 GE Area 5B: Biological Science Units 3 Fifth Semester CHEM 390GW Contemporary Chemistry and Biochemistry AR Research - GWAR (Major Upper-Division) 3 GE Area 4: Social and Behavioral Sciences 4 Sciences 4 Science is University Elective - Take Two 5 Size 4 Studies or University Elective - Take Four 5 Size 4 Studies or University Elective - Take Four 5 Size 4 Studies or University Elective - Take Four 5 Size 4 Studies or University Elective - Take Four 5 Size 4 Studies or University Elective - Take Four 5 Size 4 Studies or University Ele	PHYS 240	General Physics with Calculus III	
GE Area 3: Arts and Humanities 3 3 3 3 3 3 3 3 3	& PHYS 242	and General Physics with Calculus III	
CE Area 5B: Biological Science Units 15		Laboratory	
Note	GE Area 3: Arts and Humanities		3
Fifth Semester CHEM 390GW Contemporary Chemistry and Biochemistry Research - GWAR (Major Upper-Division) GE Area 4: Social and Behavioral Sciences ⁴ GE Area 6: Ethnic Studies (https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/) SF State Studies or University Elective - Take Two ⁵ Sixth Semester Select One (Major Upper-Division): CHEM 300 CHEM 351 CHEM 300 Physical Chemistry for Life Sciences I CHEM 351 CHEM 351 CHEM 351 CHEM 340 CHEM 340 General Biochemistry I CHEM 349 General Biochemistry I GE Area 3UD: Upper-Division Arts or Humanities U.S. and California Government (https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg) 3 SF State Studies or University Elective ⁵ Seventh Semester CHEM 325 GE Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts GE Area 5UD: Upper-Division Sciences or Upper-Division Mathematical Concepts Seventh Semester CHEM 325 GE Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts Set State Studies or University Elective - Take Two ⁵ El Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts GE Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts Set State Studies or University Elective - Take Two ⁵ Elghth Semester Upper-Division Electives ⁶ State Studies or University Elective - Take Two ⁵ Elghth Semester Upper-Division Electives ⁶ State Studies or University Elective - Take Four ⁵ 12 Elghth Semester Upper-Division Electives ⁶ State Studies or University Elective - Take Four ⁵ 12 Elghth Semester Upper-Division Electives ⁶ State Studies or University Elective - Take Four ⁵ 12 Elghth Semester Upper-Division Electives ⁶ State Studies or University Elective - Take Four ⁵ 12 Elghth Semester Upper-Division Electives ⁶ State Studies or University Elective - Take Four ⁵ 12 Elghth Semester	GE Area 5B: Biological Science		3
CHEM 390GW Contemporary Chemistry and Biochemistry Research - GWAR (Major Upper-Division) GE Area 4: Social and Behavioral Sciences 4 GE Area 6: Ethnic Studies (https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/) SF State Studies or University Elective - Take Two 5 Units 15 Sixth Semester Select One (Major Upper-Division): CHEM 300 Physical Chemistry for Life Sciences 1 CHEM 351 Physical Chemistry 1: Thermodynamics and Kinetics Select One (Major Upper-Division): CHEM 340 Select One (Major Upper-Division): GE Area 3UD: Upper-Division Arts or Humanities U.S. and California Government (https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg) 3 U.S. and California Government (https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg) 3 SE State Studies or University Elective 5 Seventh Semester CHEM 325 CHEM 326 Inorganic Chemistry (Major Upper-Division) 3 GE Area 4UD: Upper-Division Social and Behavioral Sciences 3 SF State Studies or University Elective - Take Two 5 Units 15 Lints 16 Units 17 Units 18 Lints 18 Lints 19 Lints		Units	15
Research - GWAR (Major Upper-Division) GE Area 4: Social and Behavioral Sciences ⁴ GE Area 6: Ethnic Studies (https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/) FS State Studies or University Elective - Take Two ⁵ Units 15 Sixth Semester	Fifth Semester		
GE Area 6: Ethnic Studies (https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/) 6 F State Studies or University Elective - Take Two 5 Sixth Semester Select One (Major Upper-Division): 3 CHEM 300 Physical Chemistry for Life Sciences I CHEM 351 Physical Chemistry I: Thermodynamics and Kinetics Select One (Major Upper-Division): 3 CHEM 340 Biochemistry I CHEM 349 General Biochemistry I CHEM 349 General Biochemistry I GE Area 3UD: Upper-Division Arts or Humanities 3 U.S. and California Government (https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg) 3 SF State Studies or University Elective 5 Inorganic Chemistry (Major Upper-Division) 3 GE Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts 5 GE Area 5UD or 2UD: Upper-Division Social and Behavioral Sciences SF State Studies or University Elective - Take Two 5 Eighth Semester Upper-Division Electives 6 Units 15 Eighth Semester Upper-Division Electives 6 SF State Studies or University Elective - Take Two 5 SF State Studies or University Elective - Take Two 5 Eighth Semester Upper-Division Electives 6 Units 15	CHEM 390GW	. , , , , , , , , , , , , , , , , , , ,	3
SF State Studies or University Elective - Take Two 5 Units 15 Sixth Semester Select One (Major Upper-Division): 3 CHEM 300 Physical Chemistry I: Thermodynamics and Kinetics CHEM 351 Physical Chemistry I: Thermodynamics and Kinetics Select One (Major Upper-Division): 3 CHEM 340 Biochemistry I CHEM 349 General Biochemistry GE Area 3UD: Upper-Division Arts or Humanities 3 U.S. and California Government (https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg) 3 SF State Studies or University Elective 5 3 Seventh Semester Units 15 CHEM 32S Inorganic Chemistry (Major Upper-Division) 3 GE Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts 3 GE Area 4UD: Upper-Division Social and Behavioral Sciences 3 SF State Studies or University Elective - Take Two 5 6 Eighth Semester Units 15 Upper-Division Electives 6 3 3 SF State Studies or University Elective - Take Four 5 3 3	GE Area 4: Social and Behavioral Sciences ⁴		3
Sixth Semester Select One (Major Upper-Division): CHEM 300 Physical Chemistry I: Thermodynamics and Kinetics Select One (Major Upper-Division): CHEM 351 Physical Chemistry I: Thermodynamics and Kinetics Select One (Major Upper-Division): CHEM 340 CHEM 340 CHEM 349 General Biochemistry GE Area 3UD: Upper-Division Arts or Humanities U.S. and California Government (https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg) 3 SF State Studies or University Elective 5 Units Seventh Semester CHEM 325 Inorganic Chemistry (Major Upper-Division) 3 GE Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts GE Area 4UD: Upper-Division Social and Behavioral Sciences SF State Studies or University Elective - Take Two 5 Units 15 Eighth Semester Upper-Division Electives 6 SF State Studies or University Elective - Take Four 5 Units 15 Eighth Semester Upper-Division Electives 6 SF State Studies or University Elective - Take Four 5 Units 15 Eighth Semester Upper-Division Electives 6 SF State Studies or University Elective - Take Four 5 Units 15 Eighth Semester Upper-Division Electives 5 Units 15	GE Area 6: Ethnic Studies (https://bulletin.sfsu.edu/undergraduate-education/general	ducation/areasix/)	3
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CHEM 340 CHEM 349 General Biochemistry GE Area 3UD: Upper-Division Arts or Humanities U.S. and California Government (https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg) 3 SF State Studies or University Elective 5 Units 15 Seventh Semester CHEM 325 Inorganic Chemistry (Major Upper-Division) 3 GE Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts 3 GE Area 4UD: Upper-Division Social and Behavioral Sciences SF State Studies or University Elective - Take Two 5 Units 15 Eighth Semester Upper-Division Electives 6 SF State Studies or University Elective - Take Four 5 Units 15 Units 15	CHEM 351		
CHEM 349 General Biochemistry GE Area 3UD: Upper-Division Arts or Humanities U.S. and California Government (https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg) 3 SF State Studies or University Elective 5 Units 15 Seventh Semester CHEM 325 Inorganic Chemistry (Major Upper-Division) 3 GE Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts 3 GE Area 4UD: Upper-Division Social and Behavioral Sciences SF State Studies or University Elective - Take Two 5 Units 15 Eighth Semester Upper-Division Electives 6 SF State Studies or University Elective - Take Four 5 Units 15 Units 15	Select One (Major Upper-Division):		3
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SF State Studies or University Elective - Take Two ⁵ Units Eighth Semester Upper-Division Electives ⁶ SF State Studies or University Elective - Take Four ⁵ Units 12	GE Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts		3
Units 15 Eighth Semester Upper-Division Electives ⁶ 3 SF State Studies or University Elective - Take Four ⁵ Units 15	··		3
Eighth Semester Upper-Division Electives ⁶ 3 SF State Studies or University Elective - Take Four ⁵ 12 Units 15	SF State Studies or University Elective - Take Two ⁵		6
Upper-Division Electives ⁶ SF State Studies or University Elective - Take Four ⁵ Units 3 Units		Units	15
SF State Studies or University Elective - Take Four ⁵ Units 12	· ·		
Units 15	Upper-Division Electives ⁶		3
	SF State Studies or University Elective - Take Four ⁵		12
Total Units 120		Units	15
		Total Units	120

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/)

PHYS 111 and PHYS 112 are prerequisites for PHYS 121 and PHYS 122. PHYS 220 and PHYS 222 are prerequisites for PHYS 240 and PHYS 242.

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

Complementary Studies

Students in the BA Chemistry program will satisfy the Complementary Studies requirement with the completion of courses in physics and mathematics that are required in the major.

⁶ Upper-Division Electives (3 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/ba-chemistry/#degreerequirementstext).

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/)