

BACHELOR OF SCIENCE IN PHYSICS ROADMAP – QUANTITATIVE REASONING CATEGORY I/II AND STRETCH ENGLISH

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 an advisor in your major program for further guidance.

Course	Title	Units
First Semester		
ENG 104	Writing the First Year: Finding Your Voice Stretch I ¹	3
MATH 226	Calculus I (Major Lower-Division Prerequisite, B4) ²	4
GE Area A ³		3
GE Area C		3
GE Area D		3
Units		16
Second Semester		
ENG 105	Writing the First Year: Finding Your Voice Stretch II (A2) ¹	3
CSC 309	Computer Programming (Major Upper-Division Core) ⁴	3
MATH 227	Calculus II (Major Lower-Division Prerequisite)	4
PHYS 220 & PHYS 222	General Physics with Calculus I and General Physics with Calculus I Laboratory (Major Lower-Division Prerequisite, B1, B3)	4
Units		14
Third Semester		
MATH 228	Calculus III (Major Lower-Division Prerequisite)	4

PHYS 230 & PHYS 232	General Physics with Calculus II and General Physics with Calculus II Laboratory (Major Lower-Division Prerequisite)	4
GE Area A		3
GE Area E		3
Select One:		3
SF State Studies or University Elective (if selecting MATH 245)		
MATH 325	Linear Algebra (if selecting MATH 376)	
Units		17
Fourth Semester		
Select One (Major Lower-Division Prerequisite):		
MATH 245	Elementary Differential Equations and Linear Algebra	
MATH 376	Ordinary Differential Equations I	
PHYS 240 & PHYS 242	General Physics with Calculus III and General Physics with Calculus III Laboratory (Major Lower-Division Prerequisite)	4
GE Area B: Life Science (B2)		3
GE Area C		3
GE Area D		3
Units		16
Fifth Semester		
PHYS 320 & PHYS 321	Modern Physics I and Modern Physics Laboratory (Major Upper-Division Core)	5
PHYS 330	Analytical Mechanics I (Major Upper-Division Core)	3
PHYS 385	Introduction to Theoretical Physics I (Major Upper-Division Core)	3
GE Area C		3
Units		14
Sixth Semester		
PHYS 360	Electricity and Magnetism I (Major Upper-Division Core)	3
PHYS 370	Thermodynamics and Statistical Mechanics (Major Upper-Division Core)	3
Major Elective (10 Units Total) - Take One ⁵		
GE Area F [±]		3

GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course)⁶ 3

± Given catalog rights, fall 2022 transfer students do not need to complete an Area F course.

		Units	15
Seventh Semester			
PHYS 430	Quantum Mechanics I (Major Upper-Division Core)	3	
PHYS 460	Electricity and Magnetism II (Major Upper-Division Core)	3	
PHYS 490	Physics Project Laboratory (Major Upper-Division Core)	2	
Major Elective (10 Units Total) - Take One ⁵		3	
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course) ⁶		3	

		Units	14
Eighth Semester			
PHYS 457	Introduction to Analog Electronics (Major Upper-Division Core)	4	
PHYS 491GW	Advanced Laboratory II - GVAR (Major Upper-Division Core)	1	
PHYS 695	Culminating Experience in Physics (Major Upper-Division Core)	1	
Major Elective (10 Units Total) – Take Two ⁵		5	
GE Area UD-B: Upper-Division Physical and/or Life Sciences (Consider SF State Studies Course) ⁶		3	

		Units	14
		Total Units	120

¹ ENG 114 can only be taken if you complete Directed Self-Placement (DSP) and select ENG 114; if you choose ENG 104/ENG 105 through DSP you will satisfy A2 upon successful completion of ENG 105 in the second semester; multilingual students may be advised into alternative English courses.

² To determine the best B4 course option, students should complete the online advising activity at mathadvising.sfsu.edu (<https://mathadvising.sfsu.edu/>). Questions? Contact Gator Smart Start. (<https://gatorsmartstart.sfsu.edu/>)

³ 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.

⁴ Additional upper-division elective units in astronomy, mathematics, or physics may be substituted for CSC 309 by students proficient in computer programming, subject to approval by the department chair.

⁵ **Major Electives (10 units)**
Upper-division astronomy, physics, mathematics, or related sciences courses.

⁶ To avoid taking additional units, it is recommended that you meet **U.S. and California Government** (USG/CSLG) within Upper-Division GE.