

BACHELOR OF SCIENCE IN PHYSICS: CONCENTRATION IN PHYSICS FOR TEACHING ROADMAP

120 Total Units Required
 Minimum Number of Units in the Major: 66

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 114	Writing the First Year: Finding Your Voice (A2) ¹	3
MATH 226	Calculus I (Major Prerequisite, B4) ²	4
PHYS 200	Planning for Success as a Physics & Astronomy Major (Major Prerequisite)	1
GE Area A ³		3
GE Area C		3
GE Area D		3
		Units 17
Second Semester		
MATH 227	Calculus II (Major Prerequisite)	4
PHYS 220 & PHYS 222	General Physics with Calculus I and General Physics with Calculus I Laboratory (Major Prerequisite, B1, B3)	4
GE Area A		3
GE Area E		3
		Units 14
Third Semester		
Select One (Major Upper-Division Core):		3
CSC 309	Computer Programming	
MATH 209	Mathematical Computing	
MATH 228	Calculus III (Major Prerequisite)	4
PHYS 230 & PHYS 232	General Physics with Calculus II and General Physics with Calculus II Laboratory (Major Prerequisite)	4

GE Area B: Life Science (B2)		3
		Units 14
Fourth Semester		
Select One (Major Prerequisite):		3
MATH 225	Introduction to Linear Algebra	
MATH 245	Elementary Differential Equations and Linear Algebra	
PHYS 240 & PHYS 242	General Physics with Calculus III and General Physics with Calculus III Laboratory (Major Prerequisite)	4
GE Area C - Take Two		6
GE Area D		3
		Units 16
Fifth Semester		
PHYS 320	Modern Physics I (Major Upper-Division Core)	3
PHYS 321	Modern Physics Laboratory (Major Upper-Division Core)	2
PHYS 330	Analytical Mechanics I (Major Upper-Division Core)	3
PHYS 385	Introduction to Theoretical Physics I (Major Upper-Division Core)	3
Select One:		3
MATH 376	Ordinary Differential Equations I (if MATH 225 taken)	
SF State Studies or University Elective (if MATH 245 taken)		
		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 (9-12 Units Total) - Take Two ⁴		6
GE Area F [±]		3
		Units 15
Seventh Semester		
Select One (Major Upper-Division Core):		3
E ED 655	Hands-on Undergraduate Science Education Experience	

MATH 375	Field Study for Secondary Teachers	
PHYS 491GW	Advanced Laboratory Techniques I - GVAR (Major Upper-Division Core)	3
Major Elective (9-12 Units Total) - Take One ⁴		3
GE Area UD-B: Upper-Division Physical and/or Life Sciences		3
GE Area UD-C: Upper-Division Arts and/or Humanities		3
Units		15
Eighth Semester		
Select One:		3
Major Elective (9-12 Units Total) - Take One (if MATH 245 taken) ⁴		
SF State Studies or University Elective (if MATH 225 and MATH 376 taken)		
GE Area UD-D: Upper-Division Social Sciences		3
U.S. and California Government (http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg)		3
SF State Studies or University Elective – Take Two		6
Units		15
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 **Major Electives (9-12 units)**

For students who choose MATH 245, 12 units of electives are required, whereas for students who choose MATH 225 & MATH 376, 9 units of electives are required. Selected in consultation with a faculty advisor to prepare to teach a second subject in addition to physics or general science at a 9th-grade level. Electives may be lower-division or upper-division courses.

± Given catalog rights, fall 2023 transfer students do not need to complete an Area F course.