

# BACHELOR OF SCIENCE IN PHYSICS: CONCENTRATION IN PHYSICS FOR TEACHING – PHYS ASSOCIATE DEGREE FOR TRANSFER (ADT) ROADMAP

This is a sample pathway for students who transfer to San Francisco State University in the current Bulletin year with an AS-T in Physics. Twenty-four units in the major (MATH 226, MATH 227, MATH 228, PHYS 220, PHYS 222, PHYS 230, PHYS 232, PHYS 240, and PHYS 242) and all lower-division GE requirements have been satisfied. Additional units in the major may have been satisfied. Check with a major advisor about the most appropriate course sequence. **Degree completion guaranteed in 60 units; see the Associate Degree for Transfer (ADT) section for more information (<http://bulletin.sfsu.edu/undergraduate-admissions/transfer-students/>).**

## To Do at SF State:

Enough total units to reach 120 minimum for graduation; 30 units minimum at the upper-division level; to include the following:

### University-Wide Requirements: 9-15 Units

- American Institutions (0-6 units): US History, US Government, California State and Local Government requirements if not taken before transfer
- Upper-division GE areas B, C, and D (9 units): Courses required for the major may double-count if approved for UD GE.
- Students entering the major with the AS-T in Physics are not required to fulfill SF State Studies or Complementary Studies requirements.

### Physics B.S. (Teaching) Major: 37-40 Units

MATH 226, MATH 227, MATH 228, PHYS 220, PHYS 222, PHYS 230, PHYS 232, PHYS 240, and PHYS 242 met in transfer.

- Prerequisites (3 units if MATH 245 equivalent not completed before transfer; see note 1 above)
- Upper-division Requirements (25 units)
- Electives (12 units): May be lower- or upper-division. Selected in consultation with a department advisor, courses should prepare students to teach a second subject in addition to physics or general science at the 9th-grade level.

### University Electives: 3 or More Units

Depends on course choices made at the community college, how transferred units are applied to the requirements above, and course choices at SF State. Some courses may meet more than one requirement, e.g., both in UD GE and the major.

Course	Title	Units			
<b>First Semester</b>			PHYS 320 & PHYS 321	Modern Physics I and Modern Physics Laboratory (Major Upper-Division Core)	5
Select One (Major Upper-Division Core):		3	PHYS 385	Introduction to Theoretical Physics I (Major Upper-Division Core)	3
CSC 309	Computer Programming				
MATH 209	Mathematical Computing				
MATH 245	Elementary Differential Equations and Linear Algebra (Major Prerequisite) <sup>1</sup>	3			
PHYS 200	Planning for Success as a Physics & Astronomy Major (Major Prerequisite)	1			
			<b>Units</b>		<b>15</b>
<b>Second Semester</b>			PHYS 360	Electricity and Magnetism I (Major Upper-Division Core)	3
			PHYS 370	Thermodynamics and Statistical Mechanics (Major Upper-Division Core)	3
			Major Elective (12 Units Total) - Take Two <sup>2</sup>		6

GE Area UD-B: Upper-Division Physical and/or Life Sciences		3
<b>Units</b>		<b>15</b>
<b>Third Semester</b>		
Select One (Major Upper-Division Core):		3
E ED 655	Hands-on Undergraduate Science Education Experience	
MATH 375	Field Study for Secondary Teachers	
PHYS 330	Analytical Mechanics I (Major Upper-Division Core)	3
PHYS 491GW	Advanced Laboratory Techniques I - GVAR	3
Major Elective (12 Units Total) - Take One <sup>2</sup>		3
GE Area UD-C: Upper-Division Arts and/or Humanities		3
<b>Units</b>		<b>15</b>
<b>Fourth Semester</b>		
Major Elective (12 Units Total) - Take One <sup>2</sup>		3
GE Area UD-D: Upper-Division Social Sciences		3
U.S. and California Government ( <a href="http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg">http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg</a> ) or University Elective if met in transfer		3
US History ( <a href="http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#USHaGR">http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#USHaGR</a> ) or University Elective if met in transfer		3
University Elective		3
<b>Units</b>		<b>15</b>
<b>Total Units</b>		<b>60</b>

<sup>1</sup> Students may also fulfill this requirement with both MATH 225 and MATH 376. This option may increase time to graduation. Speak with an advisor.

<sup>2</sup> **Major Electives**

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.