

# BACHELOR OF ARTS IN PHYSICS ROADMAP – QUANTITATIVE REASONING CATEGORY III/IV

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 an advisor in your major program for further guidance.

Course	Title	Units
<b>First Semester</b>		
MATH 197	Prelude to Calculus I (Prerequisite for MATH 226) <sup>1</sup>	3
PHYS 200	Planning for Success as a Physics & Astronomy Major (Major Prerequisite)	1
GE Area 1: English Communication		3
GE Area 3: Arts and Humanities		3
GE Area 4: Social and Behavioral Sciences <sup>2</sup>		3
<b>Units</b>		<b>13</b>
<b>Second Semester</b>		
MATH 198	Prelude to Calculus II (Prerequisite for MATH 226, GE 2) <sup>1</sup>	3
GE Area 1A: English Composition <sup>4</sup>		3
GE Area 1: English Communication		3
SF State Studies or University Elective <sup>3</sup>		3
<b>Units</b>		<b>12</b>
<b>Third Semester</b>		
MATH 226	Calculus I (Major Prerequisite, GE 2) <sup>1</sup>	4
GE Area 3: Arts and Humanities		3
GE Area 5B: Biological Science		3
SF State Studies or University Elective <sup>3</sup>		3
<b>Units</b>		<b>13</b>
<b>Fourth Semester</b>		
Select One (Major Upper-Division Core):		3
CSC 309	Computer Programming	
MATH 209	Mathematical Computing	
MATH 227	Calculus II (Major Prerequisite)	4

PHYS 220 & PHYS 222	General Physics with Calculus I and General Physics with Calculus I Laboratory (Major Prerequisites, GE 5A, GE 5C)	4
GE Area 4: Social and Behavioral Sciences <sup>2</sup>		3
<b>Units</b>		<b>14</b>
<b>Fifth Semester</b>		
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 6: Ethnic Studies ( <a href="https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/">https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/</a> )		3
GE Area 4UD: Upper-Division Social and Behavioral Sciences		3
<b>Units</b>		<b>14</b>
<b>Sixth Semester</b>		
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 Prerequisites)	4
GE Area 3UD: Upper-Division Arts or Humanities		3
U.S. and California Government ( <a href="https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg">https://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg</a> )		3
<b>Units</b>		<b>13</b>
<b>Seventh Semester</b>		
Select One (Major Prerequisite):		3
MATH 376	Ordinary Differential Equations I (if MATH 225 taken)	
SF State Studies or University Elective (if MATH 245 taken) <sup>3</sup>		
PHYS 320	Modern Physics I (Major Upper-Division Core)	3
PHYS 321	Modern Physics Laboratory (Major Upper-Division Core)	2
PHYS 385	Introduction to Theoretical Physics I (Major Upper-Division Core)	3

GE Area 5UD or 2UD: Upper-Division Sciences or Upper-Division Mathematical Concepts		3
<b>Units</b>		<b>14</b>
<b>Eighth Semester</b>		
PHYS 360	Electricity and Magnetism I (Major Upper-Division Core)	3
PHYS 370	Thermodynamics and Statistical Mechanics (Major Upper-Division Core)	3
Select One:		3
Major Elective (if MATH 245 taken) <sup>5</sup>		
SF State Studies or University Elective (if MATH 225/MATH 376 taken) <sup>3</sup>		
SF State Studies or University Elective - Take Two		6
<b>Units</b>		<b>15</b>
<b>Ninth Semester</b>		
PHYS 330	Analytical Mechanics I (Major Upper-Division Core)	3
PHYS 491GW	Advanced Laboratory Techniques I - GVAR (Culminating Experience)	3
SF State Studies or University Elective - Take Two <sup>3</sup>		6
<b>Units</b>		<b>12</b>
<b>Total Units</b>		<b>120</b>

<sup>1</sup> 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/>)

<sup>2</sup> First-time freshmen must take one lower-division Area 4 course that meets US History (USH).

<sup>3</sup> **Complementary Studies**

Upon completion of the BA in Physics program, students will have taken 12 units of calculus courses that satisfy complementary studies.

<sup>4</sup> 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/>)

<sup>5</sup> **Electives (0-3 units)**  
Choose enough upper-division PHYS and/or ASTR courses to reach 54 units for the major. Students who take MATH 225 & MATH 376 will not need to take a PHYS or ASTR elective.