

# BACHELOR OF SCIENCE IN PHYSICS - QUANTITATIVE REASONING CATEGORY III/IV AND ENG 114

120 Total Units Required  
 Minimum Number of Units in the Major: 71

Course	Title	Units
<b>First Semester</b>		
ENG 114	Writing the First Year: Finding Your Voice (A2) <sup>1</sup>	3
MATH 197	Prelude to Calculus I (Prerequisite for MATH 226) <sup>2,3</sup>	3
GE Area A <sup>4</sup>		3
GE Area C		3
GE Area D		3
Units		15
<b>Second Semester</b>		
MATH 198	Prelude to Calculus II (Prerequisite for MATH 226, B4) <sup>2,3</sup>	3
GE Area A		3
GE Area C		3
GE Area D		3
GE Area E		3
Units		15
<b>Third Semester</b>		
MATH 226	Calculus I (Major Lower-Division Prerequisite, B4) <sup>2,3</sup>	4
GE Area B: Life Science (B2)		3
GE Area C		3
GE Area D		3
Units		13
<b>Fourth Semester</b>		
CSC 309	Computer Programming for Scientists and Engineers (Major Lower-Division Prerequisite)	3
MATH 227	Calculus II (Major Lower-Division Prerequisite)	4

PHYS 220 or PHYS 222	General Physics with Calculus I (Major Lower-Division Prerequisite, B1, B3) or General Physics with Calculus I Laboratory	3
Units		10

<b>Fifth Semester</b>		
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 UD-B: Upper-Division Physical and/or Life Sciences (Consider SF State Studies Course)		3
SF State Studies or University Elective (if selecting MATH 245) or MATH 325	Linear Algebra (if selecting MATH 376)	3
Units		14

<b>Sixth Semester</b>		
MATH 245 or MATH 376	Elementary Differential Equations and Linear Algebra (Major Lower-Division Prerequisite) or Ordinary Differential Equations I	3
PHYS 240 & PHYS 242	General Physics with Calculus III and General Physics with Calculus III Laboratory (Major Lower-Division Prerequisite)	4
GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course)		3
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course)		3
Units		13

<b>Seventh Semester</b>		
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
<hr/>		11
<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
PHYS 457	Introduction to Analog Electronics (Major Upper-Division Core)	4
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<b>Ninth Semester</b>		
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 <sup>5</sup>		3
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<b>Tenth Semester</b>		
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 <sup>5</sup>		7
<hr/>		9
<hr/>		121
Units		9
Total Units		121

- <sup>3</sup> QR Category III students with a grade of B or higher in high school pre-calculus in the past year may be able to enroll in MATH 226. Please see a department advisor.
- <sup>4</sup> To avoid taking additional units, it is recommended that you meet **SF State Studies** requirements (AERM, GP, ES, SJ) within your GE or major.
- <sup>5</sup> **Major Electives (10 units)**  
Upper-division astronomy, physics, mathematics, or related sciences courses.

<sup>1</sup> 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.

<sup>2</sup> Depending on courses completed through Early Start, students in Pathway/Category III or IV may be required to enroll in a support course to complement their Quantitative Reasoning/B4 requirement. There are multiple course options for this pathway. Before enrolling in a B4 course, students should verify their MATH Pathway/Category in their Student Center (<http://cms.sfsu.edu/content/student-center>). Information regarding the courses that correspond with your MATH Pathway/Category can be found on the Developmental Studies Office Website (<http://developmentalstudies.sfsu.edu>).