## Bachelor of Science in Physics: Concentration in Physics for Teaching - Quantitative Reasoning Category I/II and Stretch English

120 Total Units Required  
Minimum Number of Units in the Major: 64

### Course and Title
**First Semester**
- **ENG 104**: First Year Composition Stretch 1 1
- **MATH 226**: Calculus I (Major Prerequisite, B4) 2
- **GE Area A** 3
- **GE Area C**
- **GE Area D**

Units: 16

### Second Semester
- **ENG 105**: First Year Composition Stretch II (A2) 1
- **MATH 227**: Calculus II (Major Prerequisite)
- **PHYS 220 & PHYS 222**: General Physics with Calculus I and General Physics with Calculus I Laboratory (Major Prerequisite, B1, B3)
- **GE Area A**

Units: 16

### Third Semester
- **MATH 228**: Calculus III (Major Prerequisite)
- **PHYS 230 & PHYS 232**: General Physics with Calculus II and General Physics with Calculus II Laboratory (Major Prerequisite)

GE Area B: Life Science (B2)
- **GE Area E**
- **SF State Studies or University Elective (if selecting MATH 245) or MATH 325**: Linear Algebra (if selecting MATH 376)

Units: 17

### Fourth Semester
- **MATH 245** or **MATH 376**: Elementary Differential Equations and Linear Algebra (Major Prerequisite) or Ordinary Differential Equations I
- **PHYS 240 & PHYS 242**: General Physics with Calculus III and General Physics with Calculus III Laboratory (Major Prerequisite)
- **GE Area C - Take Two**
- **GE Area D**

Units: 16

### Fifth Semester
- **PHYS 320**: Modern Physics I (Major Upper-Division Core)
- **PHYS 321**: Modern Physics Laboratory (Major Upper-Division Core)
- **PHYS 330**: Analytical Mechanics I (Major Upper-Division Core)
- **PHYS 385**: Introduction to Theoretical Physics I (Major Upper-Division Core)

GE Area D

Units: 16

### Sixth Semester
- **PHYS 360**: Electricity and Magnetism I (Major Upper-Division Core)
- **PHYS 370**: Thermodynamics and Statistical Mechanics (Major Upper-Division Core)

Major Elective (12 Units Total) - Take Two
- **GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course)**

Units: 15

### Seventh Semester
- **PHYS 490**: Physics Project Laboratory (Major Upper-Division Core)
- **SCI 652**: SF State Science Partners in K-12 Schools (Major Upper-Division Core)

Major Elective (12 Units Total) - Take One
- **GE Area UD-B: Upper-Division Physical and/or Life Sciences (Consider SF State Studies Course)**

Units: 17

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1. First Year Composition Stretch I
2. Calculus I (Major Prerequisite, B4)
3. GE Area A
4. GE Area B: Life Science (B2)
5. GE Area E
6. SF State Studies or University Elective (if selecting MATH 245) or MATH 325
7. Linear Algebra (if selecting MATH 376)
GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course) 3 Units

Eighth Semester

PHYS 491GW Advanced Laboratory II - GWAR (Major Upper-Division Core) 4 Units

PHYS 695 Culminating Experience in Physics (Major Upper-Division Core) 1 Unit

Major Elective (12 Units Total) - Take One 4 3 Units

SF State Studies or University Elective – Take Three 8 Units

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 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).

3 To avoid taking additional units, it is recommended that you meet SF State Studies requirements (AERM, GP, ES, SJ) within your GE or major.

4 Selected in consultation with a departmental advisor to prepare to teach a second subject in addition to physics, or general science at the 9th grade level. Electives may be lower-division or upper-division courses.