BACHELOR OF ARTS IN PHYSICS - QUANTITATIVE REASONING CATEGORY I/II AND STRETCH ENGLISH

120 Total Units Required
Minimum Number of Units in the Major: 52

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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENG 104</td>
<td>Writing the First Year: Finding Your Voice Stretch I ¹</td>
<td>3</td>
</tr>
<tr>
<td>MATH 226</td>
<td>Calculus I (Major Prerequisite, B4) ²</td>
<td>4</td>
</tr>
<tr>
<td>GE Area A ³</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area C</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area D</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td></td>
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</tr>
<tr>
<td>ENG 105</td>
<td>Writing the First Year: Finding Your Voice Stretch II (A2) ¹</td>
<td>3</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Calculus II (Major Prerequisite)</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 220</td>
<td>General Physics with Calculus I Laboratory (Major Prerequisites, B1, B3)</td>
<td>4</td>
</tr>
<tr>
<td>GE Area A</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>14</td>
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<tr>
<td><strong>Third Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 228</td>
<td>Calculus III (Major Prerequisite)</td>
<td>4</td>
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<tr>
<td>PHYS 230</td>
<td>General Physics with Calculus II and General Physics with Calculus I Laboratory (Major Prerequisites)</td>
<td>4</td>
</tr>
<tr>
<td>GE Area B: Life Science (B2)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area E</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>SF State Studies or University Elective (if selecting MATH 245) or ³</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>17</td>
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</tbody>
</table>

| **Fourth Semester**  |                                                                       |       |
| MATH 245 or MATH 376 | Elementary Differential Equations and Linear Algebra (Major Prerequisite) or Ordinary Differential Equations I | 3     |
| PHYS 240 & PHYS 242  | General Physics with Calculus III and General Physics with Calculus III Laboratory (Major Prerequisites) | 4     |
| GE Area D            |                                                                        | 3     |
| GE Area C - Take Two |                                                                        | 6     |
| **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     |
| GE Area D            |                                                                        | 3     |
| **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 (On advisement. PHYS 460 or PHYS 325 recommended.) | 2     |
| GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course) | 3     |
| SF State Studies or University Elective ⁴ |                                             | 3     |
| **Units**            |                                                                       | 14    |
| **Seventh Semester** |                                                                       |       |
| PHYS 490             | Physics Project Laboratory (Major Upper-Division Core)                 | 2     |
| Major Elective (On advisement. PHYS 460 or PHYS 325 recommended.) | 2     |
| GE Area UD-B: Upper-Division Physical and/or Life Sciences (Consider SF State Studies Course) | 3     |
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course) 3

<table>
<thead>
<tr>
<th>SF State Studies or University Elective - Take Two</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>15</td>
</tr>
</tbody>
</table>

**Eighth Semester**

<table>
<thead>
<tr>
<th>PHYS 491GW</th>
<th>Advanced Laboratory II - GWAR (Major Upper-Division Core) 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 695</td>
<td>Culminating Experience in Physics (Major Upper-Division Core) 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Elective (On advisement. PHYS 460 or PHYS 325 recommended.)</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF State Studies or University Elective - Take Three</td>
<td>8</td>
</tr>
<tr>
<td>Units</td>
<td>14</td>
</tr>
</tbody>
</table>

**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 **Complementary Studies**

Upon completion of the B.A. in Physics program, students will have taken 12 units of Calculus courses that satisfy the Complementary Studies requirement for a B.A. degree. Students who have earned AA-T or AS-T degrees and are pursuing a similar B.A. degree at SF State are required to fulfill the Complementary Studies requirement as defined by the major department. Students should consult with a major advisor about how transfer units and/or SF State units can best be applied to this requirement in order to ensure degree completion within 60 units.