# Bachelor of Arts in Physics Roadmap

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

<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>MATH 226</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>GE Area A: Oral Communication (A1) or Critical Thinking (A3)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE Area A: Written English Communication (A2)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE Area C: Arts (C1)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area C: Humanities: Literature (C3)</td>
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<tr>
<td><strong>Units</strong></td>
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<td>16</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 227</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 220</td>
<td>General Physics with Calculus I and General Physics with Calculus I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>&amp; PHYS 222</td>
<td></td>
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<tr>
<td>GE Area A: Oral Communication (A1) or Critical Thinking (A3)</td>
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</tr>
<tr>
<td>GE Area A: Written English Communication II (A4)</td>
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<tr>
<td>or Written English Communication (A2) Stretch II</td>
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<tr>
<td><strong>Units</strong></td>
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<td>14</td>
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<tr>
<td><strong>Third Semester</strong></td>
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<tr>
<td>MATH 228</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 325</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 230</td>
<td>General Physics with Calculus II and General Physics with Calculus II Laboratory</td>
<td>4</td>
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<tr>
<td>&amp; PHYS 232</td>
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<tr>
<td>GE Area B: Life Science (B2)</td>
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</tr>
<tr>
<td>GE Area D: U.S. History (D2) or U.S. and California Government (D3)</td>
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<tr>
<td><strong>Units</strong></td>
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<tr>
<td><strong>Fourth Semester</strong></td>
<td></td>
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<tr>
<td>MATH 245</td>
<td>Elementary Differential Equations and Linear Algebra or Ordinary Differential Equations I</td>
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<tr>
<td>or MATH 376</td>
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<tr>
<td>PHYS 240</td>
<td>General Physics with Calculus III and General Physics with Calculus III Laboratory</td>
<td>4</td>
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<tr>
<td>&amp; PHYS 242</td>
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<tr>
<td>GE Area A: Written English Communication II (A4) if not already satisfied</td>
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<tr>
<td>or Complementary Studies or SF State Studies or University Elective</td>
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<tr>
<td>GE Area D: Social Sciences (D1)</td>
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</tr>
<tr>
<td>GE Area D: U.S. History (D2) or U.S. and California Government (D3)</td>
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<tr>
<td><strong>Units</strong></td>
<td></td>
<td>16</td>
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<tr>
<td><strong>Fifth Semester</strong></td>
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<tr>
<td>PHYS 320</td>
<td>Modern Physics I</td>
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<tr>
<td>PHYS 321</td>
<td>Modern Physics Laboratory</td>
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<tr>
<td>GE Area UD-B: Upper Division Physical and/or Life Sciences (Consider SF State Studies Course)</td>
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<tr>
<td>GE Area C: Arts (C1) or Humanities (C2)</td>
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</tr>
<tr>
<td>Complementary Studies or SF State Studies or University Elective</td>
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<tr>
<td><strong>Units</strong></td>
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<td>14</td>
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### Sixth Semester

<table>
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<tr>
<th>Course</th>
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<th>Units</th>
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<tbody>
<tr>
<td>PHYS 330</td>
<td>Analytical Mechanics I</td>
<td>3</td>
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<tr>
<td>PHYS 385</td>
<td>Introduction to Theoretical Physics I</td>
<td>3</td>
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<tr>
<td></td>
<td>GE Area UD-C: Upper Division Arts and/or Humanities (Consider SF State Studies Course)</td>
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<tr>
<td></td>
<td>Complementary Studies or SF State Studies or University Elective – Take Two</td>
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### Seventh Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>PHYS 360</td>
<td>Electricity and Magnetism I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 370</td>
<td>Thermodynamics and Statistical Mechanics</td>
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<tr>
<td>PHYS 490</td>
<td>Physics Project Laboratory</td>
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<td></td>
<td>Major Elective (On advisement. PHYS 460 or PHYS 325 recommended.)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>GE Area UD-D: Upper Division Social Sciences (Consider SF State Studies Course)</td>
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</tbody>
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### Eighth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>PHYS 491GW</td>
<td>Advanced Laboratory II - GWAR ³</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 695</td>
<td>Culminating Experience in Physics</td>
<td>1</td>
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<tr>
<td></td>
<td>Major Elective (On advisement. PHYS 460 or PHYS 325 recommended.)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Complementary Studies or SF State Studies or University Elective – Take Three</td>
<td>9</td>
</tr>
</tbody>
</table>

**Total Units:** 120

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1. To avoid taking additional units, it is recommended that you meet LLD and SF State Studies requirements (AERM, GP, ES, SJ) within your GE or major.
2. 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.
3. **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.