BACHELOR OF ARTS IN PHYSICS: CONCENTRATION IN ASTRONOMY - QUANTITATIVE REASONING CATEGORY I/II AND ENG 114

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

<table>
<thead>
<tr>
<th>Course</th>
<th>First Semester</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR 115</td>
<td>Introduction to Astronomy (Major Lower-Division Prerequisite, B1)</td>
<td>3</td>
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<tr>
<td>ENG 114</td>
<td>Writing the First Year: Finding Your Voice (A2)</td>
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<tr>
<td>MATH 226</td>
<td>Calculus I (Major Lower-Division Prerequisite, B4)</td>
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<tr>
<td>GE Area A</td>
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<tr>
<td>GE Area C</td>
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<thead>
<tr>
<th>Course</th>
<th>Second Semester</th>
<th>Title</th>
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<tbody>
<tr>
<td>MATH 227</td>
<td>Calculus II (Major Lower-Division Prerequisite)</td>
<td>4</td>
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<tr>
<td>PHYS 220 &amp; PHYS 222</td>
<td>General Physics with Calculus I and General Physics with Calculus I Laboratory (Major Lower-Division Prerequisite, B1, B3)</td>
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<tr>
<td>GE Area A</td>
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<tr>
<td>GE Area E</td>
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<tr>
<th>Course</th>
<th>Third Semester</th>
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<th>Units</th>
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<tbody>
<tr>
<td>ASTR 301</td>
<td>Observational Astronomy Laboratory (Major Upper-Division Core)</td>
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<tr>
<td>MATH 228</td>
<td>Calculus III (Major Lower-Division Prerequisite)</td>
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<tr>
<td>PHYS 230 &amp; PHYS 232</td>
<td>General Physics with Calculus II and General Physics with Calculus II Laboratory (Major Lower-Division Prerequisite)</td>
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<thead>
<tr>
<th>Course</th>
<th>Fourth Semester</th>
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<th>Units</th>
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<tbody>
<tr>
<td>ASTR 300</td>
<td>Stars, Planets, and the Milky Way (Major Upper-Division Core)</td>
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<tr>
<td>PHYS 240 &amp; PHYS 242</td>
<td>General Physics with Calculus III and General Physics with Calculus III Laboratory (Major Lower-Division Prerequisite)</td>
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<tr>
<td>GE Area A</td>
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<td>GE Area C</td>
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<tr>
<td>GE Area D</td>
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<th>Fifth Semester</th>
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<tbody>
<tr>
<td>PHYS 320 &amp; PHYS 321</td>
<td>Modern Physics I and Modern Physics Laboratory (Major Upper-Division Core)</td>
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<td>GE Area D</td>
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<tr>
<td>SF State Studies or University Elective - Take Two</td>
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<tr>
<th>Course</th>
<th>Sixth Semester</th>
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<tbody>
<tr>
<td>ASTR/PHYS 340GW</td>
<td>The Big Bang - GWAR (Major Upper-Division Core)</td>
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<tr>
<td>ASTR 470</td>
<td>Observational Techniques in Astronomy (Major Upper-Division Core)</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 UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course)</td>
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<tr>
<td>SF State Studies or University Elective - Take Two</td>
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<thead>
<tr>
<th>Course</th>
<th>Seventh Semester</th>
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<tr>
<td>Major Elective - Take Two</td>
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<tr>
<td>GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course)</td>
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<tr>
<td>SF State Studies or University Elective</td>
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<table>
<thead>
<tr>
<th>Course</th>
<th>Eighth Semester</th>
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<tbody>
<tr>
<td>PHYS 695</td>
<td>Culminating Experience in Physics (Major Upper-Division Core)</td>
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<tr>
<td>Major Elective - Take One</td>
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<tr>
<td>SF State Studies or University Elective - Take Four</td>
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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. Information regarding the courses that correspond with your MATH Pathway/Category can be found on the Developmental Studies Office Website.

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.

5 Major Elective (8 units)
At least 8 units of upper-division courses in astronomy, physics, geosciences, mathematics or related subjects, selected on advisement. No more than 3 units of 600 level courses may count toward this requirement.