BACHELOR OF SCIENCE IN BIOCHEMISTRY - QUANTITATIVE REASONING CATEGORY I/II AND STRETCH ENGLISH

120 Total Units Required
Minimum Number of Units in the Major: 72

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>
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<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 115</td>
<td>General Chemistry I: Essential Concepts of Chemistry (Major Lower-Division)</td>
<td>5</td>
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<tr>
<td>ENG 104</td>
<td>Writing the First Year: Finding Your Voice Stretch I</td>
<td>3</td>
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<tr>
<td>MATH 226</td>
<td>Calculus I (Major Lower-Division, B4)</td>
<td>4</td>
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<tr>
<td>GE Area A</td>
<td></td>
<td>3</td>
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<tr>
<td><strong>Units</strong></td>
<td></td>
<td><strong>15</strong></td>
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<tr>
<td><strong>Second Semester</strong></td>
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<tr>
<td>ENG 105</td>
<td>Writing the First Year: Finding Your Voice Stretch II (A2)</td>
<td>3</td>
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<tr>
<td>MATH 227</td>
<td>Calculus II (Major Lower-Division)</td>
<td>4</td>
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<tr>
<td>Select One Set of Courses (Major Lower-Division):</td>
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<td>4</td>
</tr>
<tr>
<td>PHYS 111 &amp; PHYS 112</td>
<td>General Physics I and General Physics I Laboratory (B1, B3)</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 (B1, B3)</td>
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<tr>
<td>GE Area D</td>
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<td>3</td>
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<tr>
<td><strong>Units</strong></td>
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<tr>
<td><strong>Third Semester</strong></td>
<td>General Chemistry II: Quantitative Applications of Chemistry Concepts and General Chemistry II Laboratory: Quantitative Applications of Chemistry Concepts (Major Lower-Division)</td>
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<tr>
<td>CHEM 215 &amp; CHEM 216</td>
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<tr>
<td>GE Area A</td>
<td></td>
<td>3</td>
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<tr>
<td>GE Area E</td>
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<td>3</td>
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<tr>
<td><strong>Units</strong></td>
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<tr>
<td><strong>Fourth Semester</strong></td>
<td>Introductory Biology I (Major Lower-Division)</td>
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<td>BIOL 230</td>
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<tr>
<td>CHEM 233 &amp; CHEM 234</td>
<td>Organic Chemistry I and Organic Chemistry I Laboratory (Major Lower-Division)</td>
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<tr>
<td>GE Area C</td>
<td></td>
<td>3</td>
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<tr>
<td>GE Area D</td>
<td></td>
<td>3</td>
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<tr>
<td><strong>Units</strong></td>
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<td><strong>16</strong></td>
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<tr>
<td><strong>Fifth Semester</strong></td>
<td>Quantitative Chemical Analysis (Major Upper-Division)</td>
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<tr>
<td>CHEM 321</td>
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<td>CHEM 335</td>
<td>Organic Chemistry II (Major Upper-Division)</td>
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<tr>
<td>GWAR Elective</td>
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<td>3-4</td>
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<tr>
<td>GE Area C</td>
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<td>3</td>
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<tr>
<td>GE Area D</td>
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<td>3</td>
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<tr>
<td><strong>Units</strong></td>
<td></td>
<td><strong>15-16</strong></td>
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<tr>
<td><strong>Sixth Semester</strong></td>
<td>Biochemistry I (Major Upper-Division)</td>
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<tr>
<td>CHEM 340</td>
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<tr>
<td>CHEM 343</td>
<td>Biochemistry I Laboratory (Major Upper-Division)</td>
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<tr>
<td>Major Electives (15 Units Total) - Take One</td>
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<td>3</td>
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<tr>
<td>GE Area C</td>
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</table>
Bachelor of Science in Biochemistry - Quantitative Reasoning Category I/II and Stretch English

GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course) 3

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<tr>
<th>Units</th>
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Seventh Semester

CHEM 300 General Physical Chemistry I (Major Upper-Division) 3

CHEM 341 Biochemistry II (Major Upper-Division) 3

Major Electives (15 Units Total) - Take One 5

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

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<th>Units</th>
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Eighth Semester

CHEM 301 General Physical Chemistry II (Major Upper-Division) 3

Major Electives (15 Units Total) - Take Two 5

SF State Studies or University Elective - Take Two 6

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<th>Units</th>
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Total Units 120-121

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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. PHYS 111 and PHYS 112 are prerequisites for PHYS 121 and PHYS 122. PHYS 220 and PHYS 222 are prerequisites for PHYS 240 and PHYS 242.

5. Upper-Division Electives (15 units)

   - Students must complete at least 15 units of upper-division Chemistry and Biology electives selected from the lists below. Courses from community colleges cannot be substituted for the courses on the list below.
   - Electives must include at least:
     a. one course with a CHEM prefix,
     b. one GWAR (GW) course (See Footnote 6), and
     c. three laboratory courses.
   - Note that many Biology electives have a BIOL 240 prerequisite.
   - Students wishing to enroll in BIOL 350, BIOL 355, and BIOL 612 without completing the BIOL 240 prerequisite should contact an advisor before registration.
   - Students should consult an advisor regarding selection of elective courses and check course co- and pre-requisites before enrolling.
   - Graduate level courses in chemistry or appropriate courses in biology, physics, geosciences, and computer science may be substituted upon prior approval of advisor.

6. GWAR Elective (3-4 units of the 15 total Elective units)

   - Students must complete at least 15 units of upper-division Chemistry and Biology electives as noted above. Courses from community colleges cannot be substituted for the courses on the list below.
   - GWAR Elective (3-4 units of the 15 total Elective units)