Bachelor of Science in Chemistry - Biochemistry Option

Requirements (109-113 units)

Total units required for graduation: 180-181

Requirements for the B.S. in Chemistry - Biochemistry Option (Program Code: CBIO)

Lower-division requirements (52-54)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 215</td>
<td>General Chemistry I: Atomic Structure and Chemical Bonding</td>
<td>6</td>
</tr>
<tr>
<td>CHEM 216</td>
<td>General Chemistry II: Principles of Chemical Reactions</td>
<td>6</td>
</tr>
<tr>
<td>MATH 211</td>
<td>Basic Concepts of Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MATH 212</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 213</td>
<td>Calculus III</td>
<td>4</td>
</tr>
</tbody>
</table>

One year of introductory physics for at least 13 quarter units. CSUSB physics sequences that satisfy this requirement are:

- **Sequence A:**
  - PHYS 121 Basic Concepts of Physics I
  - PHYS 122 Basic Concepts of Physics II
  - PHYS 123 Basic Concepts of Physics III

- **Sequence B:**
  - PHYS 221 General Physics I
  - PHYS 222 General Physics II
  - PHYS 223 General Physics III

BIOL 200 Biology of the Cell 5
BIOL 201 Biology of Organisms 5
BIOL 202 Biology of Populations 5

Upper-division requirements (57-61)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 321</td>
<td>Principles of Organic Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 322</td>
<td>Principles of Organic Chemistry II</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 323</td>
<td>Principles of Organic Chemistry III</td>
<td>5</td>
</tr>
</tbody>
</table>

Note: Subject to departmental approval the organic chemistry requirement may be met with the following:

- CHEM 221A Organic Chemistry I Lecture
- CHEM 221B Organic Chemistry I Lab
- CHEM 222A Organic Chemistry II Lecture
- CHEM 222B Organic Chemistry II Lab
- CHEM 223A Organic Chemistry III Lecture
- CHEM 223B Organic Chemistry III Lab
- CHEM 421 Intermediate Organic Chemistry
- CHEM 345 Modern Quantitative Analysis 5
- CHEM 436A Biochemistry I 4
- CHEM 436B Biochemistry I 1
- CHEM 437A Biochemistry II 3
- CHEM 437B Biochemistry II 1

CHEM 438A Biochemistry III 3
CHEM 438B Biochemistry III 1

Ten units choose Group A or B below:

- **Group A:**
  - CHEM 451 Physical Chemistry for Biochemists I
  - CHEM 452 Physical Chemistry for Biochemists II

- **Group B:**
  - CHEM 455 Physical Chemistry I
  - CHEM 456 Physical Chemistry II

CHEM 470 Bioinorganic Chemistry 3-5
or CHEM 475 Inorganic Chemistry

CHEM 590A Chemistry Seminar I 1
CHEM 590B Chemistry Seminar II 1

BIOL 300 Cell Physiology 5

One course chosen from:

- BIOL 320 Microorganisms 4-6
- BIOL 324 Human Physiology for Biology Majors
- BIOL 400 Molecular Biology
- BIOL 413 Biology of Stem Cells
- BIOL 423 Genetics
- BIOL 424 Comparative Animal Physiology
- BIOL 431 Comparative Plant Physiology
- BIOL 440 Principles of Development
- BIOL 576 Endocrinology
- BIOL 580 Neurobiology

CHEM 599 Undergraduate Comprehensive Examination (covering the major field of study, to be taken during the senior year) 0

Total Units 109-115