MOLECULAR AND CELLULAR BIOLOGY CONCENTRATION

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 452</td>
<td>Cell Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIO/CHEM 475</td>
<td>Molecular Biology Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 217</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 220</td>
<td>Organic Chemistry Laboratory For Life Sciences II</td>
<td>1</td>
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<tr>
<td>CHEM 371</td>
<td>Biochemical Principles</td>
<td>5</td>
</tr>
<tr>
<td>MCRO 224</td>
<td>General Microbiology I</td>
<td>5</td>
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**Advanced Cell and Molecular Applications**\(^{1,2}\)

Select from the following: 10

- ASCI 403  Applied Biotechnology in Animal Science
- BIO 405  Developmental Biology
- BIO 426  Immunology
- BIO 428  Hematology
- BIO/CHEM 441  Bioinformatics Applications
- BIO/CHEM 476  Gene Expression Laboratory
- CHEM 372  Metabolism
- CHEM 418  Neurochemistry
- CHEM 474  Protein Techniques Laboratory
- MCRO 402  General Virology
- MCRO 433  Microbial Biotechnology

**Approved Electives**\(^{2,3,4,5}\)

Select from any 300-400 level BIO/BOT/MCRO/MSCI courses (including Advanced Cell and Molecular Applications from the list above) or select from the following: 12

At least 5 units must be upper division

- ASCI 403  Applied Biotechnology in Animal Science
- ASCI 406  Applied Animal Embryology and Assisted Reproduction
- BIO/CHEM 202  Orientation to Biotechnology
- CHEM 218  Organic Chemistry III
- CHEM 223  Organic Chemistry Laboratory for Life Sciences III
- CHEM 331  Quantitative Analysis
- CHEM 372  Metabolism
- CHEM 377  Chemistry of Drugs and Poisons
- CHEM 418  Neurochemistry
- CHEM 428  Nutritional Biochemistry
- CHEM 474  Protein Techniques Laboratory
- CSC 101  Fundamentals of Computer Science
- DATA 301  Introduction to Data Science
- ENGR 322/SCM 302  The Learn By Doing Lab Teaching Practicum\(^6\)
- ES/WGS 350  Gender, Race, Culture, Science and Technology
- PHIL 323  Ethics, Science and Technology
- PHIL 339  Biomedical Ethics

**Total units** 43

1. Excess units will be applied to Approved Electives.
2. Consultation with advisor is recommended prior to selecting approved electives; bear in mind your selections may impact pursuit of post-baccalaureate studies and/or goals.
3. Consult with your faculty advisor for approval to use other relevant upper-division coursework in other departments.
4. Courses taken to meet a major or support requirement cannot be double-counted as an elective.
5. Maximum of 6 units may be applied toward Approved Electives: BIO 300, BIO 400, BIO 450, BIO 485, BIO 495.
6. Maximum of 2 units may be applied toward Approved Electives from ENGR 322/SCM 302.