## 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>
</tr>
<tr>
<td>CHEM 371</td>
<td>Biochemical Principles</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 372</td>
<td>Metabolism</td>
<td>4</td>
</tr>
<tr>
<td>MCRO 224</td>
<td>General Microbiology I</td>
<td>5</td>
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</tbody>
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### Advanced Cell and Molecular Applications

Select from the following: 9

- 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 474: Protein Techniques Laboratory
- MCRO 402: General Virology
- MCRO 433: Microbial Biotechnology

### Electives

Select from Advanced Cell and Molecular Applications (above) or any 300-400 level BIO/BOT/MCRO/MSCI courses or select from the following: 4

- ASCI 503: Advanced Molecular Techniques in Animal Science
- BIO/CHEM 202: Orientation to Biotechnology
- CHEM 218 & CHEM 223: Organic Chemistry III and Organic Chemistry Laboratory for Life Sciences III
- CHEM 331: Quantitative Analysis
- CHEM 377: Chemistry of Drugs and Poisons
- CHEM 528: Nutritional Biochemistry
- ENGR 322/SCM 302: The Learn By Doing Lab Teaching Practicum
- ES/WGS 350: Gender, Race, Culture, Science and Technology
- PHIL 339 or PHIL 341 or SCM 451: Biomedical Ethics or Professional Ethics or Ethics in the Sciences
- STAT 313: Applied Experimental Design and Regression Models

Total units: 43

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1 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.

2 Consult with your faculty advisor for approval to use other relevant upper-division coursework in other departments.

3 If any of these courses is taken to meet a major or support requirement in the degree, it cannot be double-counted as an approved elective.

4 Maximum of 6 units may be applied toward Approved Electives from "by arrangement" courses: BIO 330, BIO 400, BIO 450, BIO 461, BIO 462, BIO 463, BIO 471, BIO 472, BIO 485, BIO 495, ENGR 322/SCM 302.