### 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

Select from the following:

1. ASCI 403: Applied Biotechnology in Animal Science
2. BIO 405: Developmental Biology
3. BIO 426: Immunology
4. BIO 428: Hematology
5. BIO/CHEM 441: Bioinformatics Applications
6. BIO/CHEM 476: Gene Expression Laboratory
7. CHEM 372: Metabolism
8. CHEM 418: Neurochemistry
9. CHEM 474: Protein Techniques Laboratory
10. MCRO 402: General Virology
11. MCRO 433: Microbial Biotechnology

#### Approved Electives

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:

1. ASCI 403: Applied Biotechnology in Animal Science
3. BIO/CHEM 202: Orientation to Biotechnology
4. CHEM 218: Organic Chemistry III
5. CHEM 223: Organic Chemistry Laboratory for Life Sciences III
6. CHEM 331: Quantitative Analysis
7. CHEM 372: Metabolism
8. CHEM 377: Chemistry of Drugs and Poisons
9. CHEM 418: Neurochemistry
10. CHEM 428: Nutritional Biochemistry
11. CHEM 474: Protein Techniques Laboratory
12. CSC 101: Fundamentals of Computer Science
13. DATA 301: Introduction to Data Science
14. ENGR 322/SCM 302: The Learn By Doing Lab Teaching Practicum
15. ES/WGS 350: Gender, Race, Culture, Science and Technology
16. PHIL 323: Ethics, Science and Technology
17. PHIL 341: Professional Ethics
18. STAT 313: Applied Experimental Design and Regression Models

#### Total Units
- 43

### Notes
1. Consultation with advisor is recommended prior to selecting electives; bear in mind your selections may impact pursuit of post-baccalaureate studies and/or goals.
2. Excess units will be applied to Approved Electives.
3. Consult with your faculty advisor for approval to use other relevant upper-division coursework in other departments.
4. If a course is taken to meet a Major or Support requirement, it cannot be double-counted in the concentration.
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.