# Department of Biology Graduation Checklist

http://biology.sfsu.edu/content/biology-undergraduate-graduation-checklists

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**SFSU Bulletin Year 2019-2020**

## BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN CELL & MOLECULAR

**Course is 3 units unless otherwise noted.**

<table>
<thead>
<tr>
<th>Lower Division Requirements (38-39 units)</th>
<th>Units</th>
<th>√</th>
<th>Equiv. Form if any (✓)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 230 Introductory Biology I</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 240 Introductory Biology II</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 115 General Chemistry I: Essential Concepts of Chemistry</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 215/216 General Chemistry II: Quant. Appl. of Chem. Conc./Lab (3/2)</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 233 Organic Chemistry I [must take Chem 335 BEFORE taking Biochemistry (Chem 340 or Chem 349)]</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 226 Calculus I</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 111/112 General Physics I/Laboratory (3/1)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 121/122 General Physics II/Laboratory (3/1)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**One course selected from the following (3-4 units):**

<table>
<thead>
<tr>
<th>MATH 227 Calculus II (4)</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>CSC 210 Introduction to Computer Programming</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 358 Forensic Genetics: Math Matters (4)</td>
<td></td>
<td></td>
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<tr>
<td>BIOL 458 Biometry (4)</td>
<td></td>
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</tr>
</tbody>
</table>

**Total lower division requirements (units):** 38-39

## Upper Division Requirements (30 units)

<table>
<thead>
<tr>
<th>BIOL 350 Cell Biology</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 351GW Experiments in Cell and Molecular Biology - GWAR</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 355 Genetics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 357 Molecular Genetics</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 335 Organic Chemistry II</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 349 General Biochemistry</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Students may take CHEM 340 (3) and CHEM 341(3) in lieu of CHEM 349 upon advisement*

**Upper division electives upon advisement. At least one elective course must have an upper division laboratory component.**

**Graduate level courses may be used upon advisement.**

| BIOL 332 Health Disparities in Cancer |   |   |                        |
| BIOL 337 Evolution |   |   |                        |
| BIOL 344GW Research Skills - GWAR |   |   |                        |
| BIOL 349 Bioethics |   |   |                        |
| BIOL 356 Honors Genetics (2) |   |   |                        |
| BIOL 358 Forensic Genetics: Math Matters (4) (if not used to meet Math requirement) |   |   |                        |
| BIOL 380 Evolutionary Developmental Biology |   |   |                        |
| BIOL 382 Developmental Biology |   |   |                        |
| BIOL 401 General Microbiology |   |   |                        |
| BIOL 402GW General Microbiology Laboratory - GWAR |   |   |                        |
| BIOL 411 Environmental Microbiology |   |   |                        |
| BIOL 420 General Virology |   |   |                        |

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[1] General Microbiology Laboratory - GWAR
<table>
<thead>
<tr>
<th>Course Num.</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 425</td>
<td>Emerging Diseases</td>
<td></td>
</tr>
<tr>
<td>BIOL 435</td>
<td>Immunology</td>
<td></td>
</tr>
<tr>
<td>BIOL 436</td>
<td>Immunology Laboratory (2)</td>
<td></td>
</tr>
<tr>
<td>BIOL 442</td>
<td>Microbial Physiology</td>
<td></td>
</tr>
<tr>
<td>BIOL 443</td>
<td>Microbial Physiology Laboratory (2)</td>
<td></td>
</tr>
<tr>
<td>BIOL 446</td>
<td>Microbial Genomics (4)</td>
<td></td>
</tr>
<tr>
<td>BIOL 453</td>
<td>General Parasitology</td>
<td></td>
</tr>
<tr>
<td>BIOL 454</td>
<td>Parasitology Laboratory (1)</td>
<td></td>
</tr>
<tr>
<td>BIOL 458</td>
<td>Biometry (4) (if not used to meet Math requirement)</td>
<td></td>
</tr>
<tr>
<td>BIOL 490</td>
<td>Ecology of Infectious Diseases (4)</td>
<td></td>
</tr>
<tr>
<td>BIOL 525</td>
<td>Plant Physiology</td>
<td></td>
</tr>
<tr>
<td>BIOL 526</td>
<td>Plant Molecular Physiology Laboratory (2)</td>
<td></td>
</tr>
<tr>
<td>BIOL 615</td>
<td>Molecular Pathophysiology</td>
<td></td>
</tr>
<tr>
<td>BIOL 618</td>
<td>Biology of Aging</td>
<td></td>
</tr>
<tr>
<td>BIOL 623</td>
<td>Pharmacology</td>
<td></td>
</tr>
<tr>
<td>BIOL 630</td>
<td>Animal Physiology</td>
<td></td>
</tr>
<tr>
<td>BIOL 631GW</td>
<td>Animal Physiology Laboratory - GWAR (4)</td>
<td></td>
</tr>
<tr>
<td>BIOL 638</td>
<td>Bioinformatics &amp; Genome Annotation (4)</td>
<td></td>
</tr>
<tr>
<td>BIOL 640</td>
<td>Cellular Neurosciences</td>
<td></td>
</tr>
<tr>
<td>BIOL 652</td>
<td>Science Education Partners in Biology (4)</td>
<td></td>
</tr>
<tr>
<td>BIOL 699</td>
<td>Special Study in Biology (1-3 units) requires faculty mentor's approval</td>
<td></td>
</tr>
<tr>
<td>CHEM 343</td>
<td>Biochemistry I Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

‡meets upper division laboratory elective requirement

What course has student taken to meet GWAR? (typically Biol 351GW)

GWAR course must be completed with a C- or better to meet graduation requirements

<table>
<thead>
<tr>
<th>Required</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total upper division unit requirements:</td>
<td>30</td>
</tr>
<tr>
<td>Total units for major</td>
<td>68-69</td>
</tr>
</tbody>
</table>