# Biology-BA or BS-General

**FOR PRE-PROFESSIONAL STUDENTS**

This is a **general** curriculum guide and is not applicable to every student. It is important to meet with your advisor.

## Year One

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIO 121</strong></td>
<td>General Biology II w/lab</td>
<td>MTH 110 (may be taken concurrently)</td>
<td>4</td>
</tr>
<tr>
<td><strong>CHM 115</strong></td>
<td>Principles of Chemistry I w/lab</td>
<td>High school chemistry and (MTH 110 or MTH 122 or MTH 125 or MTH 201)</td>
<td>4</td>
</tr>
<tr>
<td><strong>MTH 122</strong></td>
<td>College Algebra</td>
<td>MTH 110 or assignment through Grand Valley math placement</td>
<td>3</td>
</tr>
<tr>
<td>Gen Ed</td>
<td><em>It is strongly recommended that BIO majors take BIO 121 before BIO 120.</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total** | | **14** |

### Notes:
- Numbers noted within (parentheses) are contact hours
- Gen Ed refers to any course that will help you earn the required 120 credits to graduate.

## Year Two

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIO 215</strong></td>
<td>Ecology w/lab (summer and fall only)</td>
<td>BIO 120 and BIO 121 (BIO 120 may be taken concurrently)</td>
<td>4</td>
</tr>
<tr>
<td><strong>BMS 208</strong></td>
<td>Human Anatomy (BIO elective)</td>
<td>BIO 120</td>
<td>3</td>
</tr>
<tr>
<td><strong>CHM 241</strong></td>
<td>Organic Chemistry for Life Sciences I w/lab</td>
<td>CHM 116</td>
<td>5</td>
</tr>
<tr>
<td>Gen Ed</td>
<td>(PSY 101 recommended)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total** | | **15** |

### Notes:
- **BIO 215** is required for pre-professional students but is not part of the Biology major.

## Year Three

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIO 375</strong></td>
<td>Genetics and BIO 376 Genetics Laboratory</td>
<td>BIO 120. Concurrent enrollment in BIO 376 is required</td>
<td>4</td>
</tr>
<tr>
<td><strong>CHM 461</strong></td>
<td>Biochemistry I</td>
<td>CHM 242, CHM 247 or CHM 248</td>
<td>4</td>
</tr>
<tr>
<td><strong>PHY 220</strong></td>
<td>General Physics I w/lab</td>
<td>MTH 122 and MTH 123</td>
<td>5</td>
</tr>
<tr>
<td>Gen Ed</td>
<td>(SOC 101 recommended)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total** | | **16** |

### Notes:
- **BIO 375** is a required course.

## Year Four

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CMB 405</strong></td>
<td>Cell and Molecular Biology</td>
<td>BIO 375 or 355, BIO 376, and (CHM 232 or CHM 242 or CHM 247) may be taken concurrently</td>
<td>4</td>
</tr>
<tr>
<td><strong>CMB 406</strong></td>
<td>SWS Cell and Molecular Biology Laboratory</td>
<td>BIO 405 (may be taken concurrently)</td>
<td>2</td>
</tr>
<tr>
<td>Issue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gen Ed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total** | | **15** |

### Notes:
- **BIO 495** is required for pre-professional students but is not part of the Biology major.

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**Total Credits:** 16**

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**The block tuition rate is for 12-15 credits. You will pay additional tuition for any credits over 15:**

1. Students planning on professional or graduate school should complete CHM 241, CHM 242, CHM 461, and PHY 220 and PHY 221. See the Pre-Professional Advisors in the CLAS Academic Advising Center for more information.

2. Students must complete a minimum of 41 credits of Biology coursework. See reverse for required Category elective courses.

3. Choose one of the following to complete the math cognate for the major: MTH 125: Survey of Calculus, MTH 201: Calculus, or STA 215: Introductory Applied Statistics. Students who don’t place into MTH 201 should take MTH 124 as a prerequisite instead of MTH 122+123.

4. MTH 122/123 are prerequisites for other courses and are not part of the Biology major. MTH 124 and/or MTH 201 will substitute for MTH 122 and MTH 123. CHM 461 is required for pre-professional students but is not part of the Biology major. Students have the option of taking the **Math Proficiency Tests for MTH 122 and/or 123 online: www.gvsu.edu/s/mv**

5. Elective refers to any course that will help you earn the required 120 credits to graduate.

6. Students must complete a total of two courses with an SWS attribute.
Declarating the Biology-General Major:
1. In myBanner, select “Student” > “Student Records” > “Change Major” > “Change Major 1/Program”
2. Choose “Biology (BA or BS)-General Biology” from the drop-down box.
3. Click “Submit” and then “Change to New Program”
4. Declare “Pre-Professional” as your SECOND MAJOR if you are planning on medical, dental, pharmacy, or optometry school.
   → If you are Pre-Veterinary, the Biology with Pre-Veterinary emphasis is recommended

<table>
<thead>
<tr>
<th>General Education Categories fulfilled by the Biology major:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Science and Physical Science: BIO 120 and CHM 115 (both fulfill lab requirement)</td>
</tr>
<tr>
<td>Mathematical Sciences: STA 215, MTH 122, MTH 123, MTH 201</td>
</tr>
</tbody>
</table>

Students must complete one course from Categories I, II, and V, and one course from either Category III or IV.

The BIO-General major requires a total of **41 credits** of BIO classes, including certain CMB and BMS courses. Elective courses may only count in one category.

### Category I: Plant Organismal Biology
- BIO 243 Plant Identification & Natural History (3) w/lab
- BIO 303 Plant Morphology (4) w/lab
- BIO 313 Plants and Islands (4) w/lab
- BIO 323 Aquatic and Wetland Plants (3) w/lab
- BIO 333 Systematic Botany (4) w/lab
- BIO 383 Plant-Fungal Interactions (4) w/lab
- BIO 403 Plant Structure and Function (4) w/lab
- BIO 413 Freshwater Algae (3) w/lab
- BIO 423 Plant Biotechnology (3) w/lab
- BIO 433 Plant Ecology (4) w/lab

*Numbers in parentheses indicate # of credits

**Offered in Fall semesters only**

**Offered in Winter semesters only**

### Category II: Animal Organismal Biology
- BMS 208+309 Human Anatomy and Lab (4)
- BMS 290+291 Human Physiology and Lab (4)

### Category III: Principles of Ecology and Evolutionary Biology
- BIO 303 - Plant Morphology (4) w/lab
- BIO 313 - Plants and Islands (4) w/lab
- BIO 333 - Systematic Botany (4) w/lab
- BIO 349 - The Darwinian Revolution (3)
- BIO 352 - Animal Behavior (3) w/lab
- BIO 370 - Marine Biology (3)
- BIO 433 - Plant Ecology (4) w/lab
- BIO 440 - Limnology (4) w/lab
- BIO 450 - Stream Ecology (4) w/lab
- BIO 452 - Human Evolution (3)
- BIO 460 - Terrestrial Ecosystem Ecology (4) w/lab
- BIO 473 - Ecology and Evolution of Plant-Animal Interactions (3)
- BIO 475 - Population Genetics (3)

### Category IV: Applied Ecology & Evolution
- BIO/NRM 308 - Wildlife Ecology (4) w/lab
- BIO 357 - Environmental Microbiology* (4) w/lab
- BIO 362 - Fisheries Biology (3) w/lab
- BIO 370 - Marine Biology (3)
- BIO/NRM 386 - Ecological Restoration & Management (4) w/lab
- BIO 402 - Aquatic Insects (3) w/lab
- BIO 407 - Biology and Society: Study Abroad (with advisor’s permission)
- BIO/NRM 408 - Wildlife Management (4) w/lab
- BIO 417 - International Field Biology (with advisor’s permission)
- BIO 418 - Regional Field Biology (with advisor’s permission)
- BIO 440 - Limnology (4) w/lab
- BIO 450 - Stream Ecology (4) w/lab
- BIO 470 - Conservation Biology (3)
- BIO 473 - Ecology and Evolution of Plant-Animal Interactions (3)
- BIO 475 - Population Genetics (3)
- BIO/NRM 486 - Advanced Restoration Ecology (3)

### Category V: Biomolecular Processes
- BMS 212 and BMS 213* Introductory Microbiology and Lab (4)

*Note: students may count BIO 357 or BMS 212/213 towards the Biology degree, but not both

### Excluded and Restricted Courses:
- The following courses may not count towards the Biology major:
  - BIO 104 - Biology for the 21st Century (4)
  - BIO 105 - Environmental Science (3)
  - BIO 107 - Great Lakes & Other Water Resources (4)
  - BIO 109 - Plants in the World (4)
  - BIO 205 - Genetics for K-8 Pre-Service Teachers (2)
- Any other biology course whose description prevents it from being used in the major.
- The following course may only count towards the Biology major with advisor’s permission.
  - BIO 355 - Human Genetics (3)

- The following courses can satisfy part of Gen Ed Issues requirement and may count towards the Biology major after elective-category requirements are satisfied:
  - BIO 309 - Plants and Human Health (3)
  - BIO 311 - Who’s Running Your Life: Genes, Evolution and Behavior (3)
  - BIO 319 - Global Agricultural Sustainability (3)
  - BIO 328 - Biomedical Ethics (3)
  - BIO 329 - Evolution of Social Behavior (3)
  - BIO 338 - Environmental Ethics (3)

It is imperative to meet with your faculty advisor and an advisor in the CLAS Academic Advising Center regularly.

The CLAS Academic Advising Center is located in C-1-120 MAK, 616-331-8585

To schedule an appointment with a Biology and/or Pre-Professional Advisor in the CLAS Academic Advising Center, visit [www.gvsu.edu/clasadvising](http://www.gvsu.edu/clasadvising) and click on “Schedule Appointment”

To find more information on Pre-Professional programs, visit [www.gvsu.edu/clasadvising/preprofessional](http://www.gvsu.edu/clasadvising/preprofessional)

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