

**BIOLOGY-BA OR BS - GENETICS***The BA degree requires 3<sup>rd</sup> semester proficiency in a foreign language (201 level).*THIS IS A **GENERAL** CURRICULUM GUIDE AND IS NOT APPLICABLE TO EVERY STUDENT. IT IS IMPORTANT TO MEET WITH YOUR ADVISOR.

Year One			
<b>BIO 121*</b> General Biology II w/lab Prerequisite: MTH 110 (may be taken concurrently) <sup>4</sup> Elective	4 (6) 1	<b>BIO 120*</b> General Biology I w/lab (GE Life Science) <i>Prerequisites: High school chemistry, CHM 109, or CHM 115 strongly recommended (CHM 109 or 115 may be taken concurrently)</i>	4 (6)
<b>CHM 115</b> Principles of Chemistry I w/lab (GE Physical Science) Prerequisites: High school chemistry and (MTH 110 or MTH 122 or MTH 125 or MTH 201)	4 (6)	<b>CHM 116</b> Principles of Chemistry II w/lab Prerequisites: CHM 115 and (MTH 122, 125 or 201)	5 (7)
<sup>3</sup> <b>MTH 122</b> College Algebra or Elective <sup>4</sup> Prerequisite: MTH 110 or math placement	3	<sup>1</sup> <b>WRT 130 or WRT 150</b> Strategies in Writing (GE Writing)	3-4
Gen Ed (GE Art) or <sup>1</sup> WRT 120 (self-placement)	3	Gen Ed (GE Philosophy & Literature)	3
<i>*It is recommended that BIO majors take BIO 121 before BIO 120.</i>			
<i>Numbers noted within (parentheses) are contact hours</i>	<i>Total</i>	<i>Total</i>	<i>15-16*</i>
15			
Year Two			
<b>BIO 215</b> Ecology w/lab ( <i>summer and fall only</i> ) Prerequisites: BIO 121	4 (6)	<b>BIO 210</b> Evolutionary Biology Prerequisites: BIO 120 and BIO 121	3
<sup>2</sup> <b>CHM 231</b> Introductory Organic Chemistry w/lab Prerequisite: CHM 109 or CHM 116	4 (7)	<sup>2</sup> <b>CHM 232</b> Biological Chemistry w/lab Prerequisite: CHM 231	4 (7)
<b>OR</b> <sup>2</sup> <b>CHM 241</b> Organic Chemistry for Life Sciences I w/lab Prerequisite: CHM 116	5 (7)	<b>OR</b> <sup>2</sup> <b>CHM 242</b> Organic Chem. for Life Sciences II w/lab Prerequisite: CHM 241	4 (6)
<sup>5</sup> MTH/STA Requirement (GE Math)	3-4	<b>BIO 355</b> Human Genetics <b>OR</b> <b>BIO 375</b> Genetics BIO 355/375 Prerequisites: BIO 120 or CMB 155 and 156	3
Gen Ed (GE Social/Behavioral)	3	<b>BIO 376</b> Genetics Laboratory Prerequisite: BIO 375 or 355 (may be taken concurrently)	1 (3)
<sup>4</sup> Elective (if needed)	1	Gen Ed (GE Social/Behavioral)	3
		<b>BIO 130</b> Careers in Biology	1
<i>Total</i>	<i>15-16*</i>	<i>Total</i>	<i>15</i>
Year Three			
<b>BIO 475</b> Population Genetics (fall even years only) Prerequisite: BIO 210 and (either BIO 355 or 375)	3	<b>BIO 416</b> Advanced Genetics Lab Prerequisite: BIO 376; CMB 411 or CMB 414 recommended (may be taken concurrently)	2
<sup>2</sup> Supplementary Skills Elective(see list below) Gen Ed (GE Historical Analysis)	3-5	<b>Biology Elective</b> (see list below)	3-4
Gen Ed (GE US Diversity)	3	<sup>2</sup> Supplementary Skills Elective(see list below)	3-5
<sup>4</sup> Elective	1-3	Issues	3
		Gen Ed (GE Art) or <sup>4</sup> Elective (if needed)	3
		<sup>4</sup> Elective (if needed)	1
<i>Total</i>	<i>15</i>	<i>Total</i>	<i>15-16*</i>
Year Four			
<b>Biology Elective</b> (see list below)	3-4	<sup>6, 7</sup> <b>BIO 495 SWS</b> Perspectives in Biology (Capstone) Prerequisites: Senior Standing, and either STA 215, MTH 125 or MTH 201	3
<b>Biology Elective</b> (see list below)	3-4	<b>Biology Elective</b> (see list below, if needed)	3-4
<sup>6</sup> Issues+SWS	3	<sup>4</sup> Elective or (Gen Ed, if needed)	3
Gen Ed (GE Global Perspectives)	3	<sup>4</sup> Elective	3
<sup>4</sup> Elective	1-3	<sup>4</sup> Elective	2-3
<i>Total</i>	<i>15</i>	<i>Total</i>	<i>15</i>

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

<sup>1</sup> WRT 150 earned through AP/Dual Enrollment will fulfill the WRT 150 requirement. A grade of C or better is required in WRT 130 or 150.<sup>2</sup> Students considering professional school need CHM 241, CHM 242, CHM 461, and PHY 220 + PHY 221. The Pre-Professional emphasis is recommended. Students should consult with a Preprofessional Advisors in the CLAS Academic Advising Center. Those pursuing graduate school in the biological sciences should consult their faculty advisor regarding admissions requirements for academic graduate programs.<sup>3</sup> MTH 122 is not a required course in the Biology major. Students who plan to take CHM 116 must complete MTH 122. MTH 124 and MTH 201 will substitute for MTH 122. **Take the Math Proficiency Tests for MTH 122 and/or 123 online: [www.gvsu.edu/s/mv](http://www.gvsu.edu/s/mv)**<sup>4</sup> Students must have a **minimum of 120 credits** to graduate with **58 of the 120 credits** being from a senior level institution and the **final 30 of the 120 credits** completed at GVSU. Elective refers to any course that will help meet these requirements.

<sup>5</sup>Choose one of the following for the math/statistics requirement 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.

<sup>6</sup>Students must complete a total of two courses with an SWS attribute.

<sup>7</sup>May substitute a 3-credit BIO 490 or BIO 499 with advisor approval. Must occur in final year and include a public presentation. Doesn't satisfy SWS.

### Declaring the Biology Major:

1. In myBanner, select "Student" > "Student Records" > "Change Major" > "Change Major 1/Program"
2. Choose "Biology-(BA or BS)-Genetics" from the drop-down box.
3. Click "Submit" and then "Change to New Program"
4. Declare "**Preprofessional Preparation**" as your SECOND MAJOR if you are planning on medical, dental, pharmacy, or optometry school.
  - If you are planning on Premedical, dental, pharmacy, podiatry, or optometry, the **Biology with Pre-Professional emphasis** is suggested

General Education Categories fulfilled by the Biology major:
Life Science and Physical Science: BIO 120 and CHM 109 or CHM 115 (both fulfill lab requirement)
Mathematical Sciences: STA 215, MTH 125, or MTH 201

Students in the Genetics Emphasis must complete one of the following Supplemental Skill options below.	
<b>Option 1: Statistics (6 credits)</b> <ul style="list-style-type: none"> <li>• STA 216 Intermediate Applied Statistics (3)</li> <li>• STA 310 Intro to Biostatistics (3) <b>OR</b> STA 211 Intro to Survey Sampling (3) <b>OR</b> STA 312 Probability &amp; Statistics (3)</li> </ul>	<b>Option 3: Computer Science – Choose 2 courses (6 credits)</b> <ul style="list-style-type: none"> <li>• CIS 160 Learn to Code in Python (3) <b>OR</b> CIS 161 Computational Science (3)</li> <li>• CIS 231 Problem Solving with Spreadsheets (3)</li> <li>• CIS 335 Data Mining (3)</li> </ul>
<b>Option 2: Physics (10 credits)</b> <ul style="list-style-type: none"> <li>• PHY 220 <b>AND</b> PHY 221 General Physics I &amp; II (10)</li> <li>• <b>OR</b> PHY 230 <b>AND</b> PHY 231 Principles of Physics I &amp; II (10)</li> </ul>	
Students in the Genetics Emphasis must complete 11 credits of Biology electives from the list below including at least one (1) lab.	
BIO 396 Laboratory Assistant in Genetics (1) <sup>1</sup> BIO 422 Animal Development Biology (3) w/lab <sup>2</sup> BIO/CMB 485 Molecular Ecology (3) w/lab <sup>1</sup> BIO 357* Environmental Microbiology (4) w/lab <sup>2</sup> BIO 423 Plant Biotechnology (3) w/lab BIO 490 Internship (1-3) BIO 499 Research in Biology (1-3)  <sup>1E</sup> BMS 312 Bacterial Genetics (3) <sup>1E</sup> BMS 313 Bacterial Genetics Lab (1)  CHM 461 Biochemistry (4) CHM 462+SWS Techniques in Biochemistry w/ lab (3)  CMB 405 Cell and Molecular Biology (4) CMB 406+SWS Cell and Molecular Bio. Lab (2) <sup>2</sup> CMB 411 Genetics of Development & Cancer (3) <sup>2</sup> CMB 440 Research Applications in Drosophila Genomics (3) CMB 451 Bioinformatics: Tools and Techniques for Life Scientists (3) <sup>1</sup> CMB 460 Genomics and Molecular Diagnostics (3) <sup>1</sup> CMB 426 Research Applications in Nucleic Acids (4)	<b>Notes</b> <ul style="list-style-type: none"> <li>• For those interested in microbiology, it is recommended to take one of BIO 357 or BMS 212/213, but not both</li> </ul> <p><sup>1</sup><i>Offered in Fall semesters</i>  <sup>2</sup><i>Offered in Winter semesters</i>  <sup>SS</sup><i>Offered in spring/summer</i>  <sup>E</sup><i>Offered in Even years</i>  <sup>O</sup><i>Offered in Odd years</i>  <b>Numbers in parentheses indicate # of credits</b></p>

**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 Preprofessional 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 Preprofessional programs, visit [www.gvsu.edu/clasadvising/preprofessional](http://www.gvsu.edu/clasadvising/preprofessional).