

BIOLOGY-BA OR BS - GENETICS*The BA degree requires 3rd 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			
BIO 121* General Biology II w/lab Prerequisite: MTH 110 (may be taken concurrently)	4 (6)	BIO 120* 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)
CHM 115 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)	CHM 116 Principles of Chemistry II w/lab Prerequisites: CHM 115 and (MTH 122, 125 or 201)	5 (7)
³ MTH 122 College Algebra or Elective ⁴ Prerequisite: MTH 110 or math placement	3	¹ WRT 130 or WRT 150 Strategies in Writing (GE Writing)	3-4
Gen Ed (GE Art) or ¹ WRT 120 (self-placement)	3	Gen Ed (GE Philosophy & Literature)	3
BIO 130 Careers in Biology	1		
<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			
BIO 215 Ecology w/lab (<i>summer and fall only</i>) Prerequisites: BIO 121	4 (6)	BIO 210 Evolutionary Biology Prerequisites: BIO 120 and BIO 121	3
² CHM 231 Introductory Organic Chemistry w/lab Prerequisite: CHM 109 or CHM 116	4 (7)	² CHM 232 Biological Chemistry w/lab Prerequisite: CHM 231	4 (7)
OR ² CHM 241 Organic Chemistry for Life Sciences I w/lab Prerequisite: CHM 116	5 (7)	OR ² CHM 242 Organic Chem. for Life Sciences II w/lab Prerequisite: CHM 241	4 (6)
⁵ MTH/STA Requirement (GE Math)	3-4	BIO 355 Human Genetics OR BIO 375 Genetics BIO 355/375 Prerequisites: BIO 120 or CMB 155 and 156	3
Gen Ed (GE Social/Behavioral)	3	BIO 376 Genetics Laboratory Prerequisite: BIO 375 or 355 (may be taken concurrently)	1 (3)
⁴ Elective (if needed)	1	Gen Ed (GE Social/Behavioral)	3
		⁴ Elective	1
<i>Total</i>	<i>15-16*</i>	<i>Total</i>	<i>15</i>
Year Three			
BIO 475 Population Genetics (fall even years only) Prerequisite: BIO 210 and (either BIO 355 or 375)	3	BIO 416 Advanced Genetics Lab (winter only) Prerequisite: BIO 376; CMB 411 or CMB 414 recommended (may be taken concurrently)	2
² Supplementary Skills Elective(see list below)	3-5	Biology Elective (see list below)	3-4
Gen Ed (GE Historical Analysis)	3	² Supplementary Skills Elective(see list below)	3-5
Gen Ed (GE US Diversity)	3	Issues	3
⁴ Elective	1-3	Gen Ed (GE Art) or ⁴ Elective (if needed)	3
		⁴ Elective (if needed)	1
<i>Total</i>	<i>15</i>	<i>Total</i>	<i>15-16*</i>
Year Four			
Biology Elective (see list below)	3-4	^{6, 7} BIO 495 SWS Perspectives in Biology (Capstone) Prerequisites: Senior Standing, and either STA 215, MTH 125 or MTH 201	3
Biology Elective (see list below)	3-4	Biology Elective (see list below, if needed)	3-4
⁶ Issues+SWS	3	⁴ Elective or (Gen Ed, if needed)	3
Gen Ed (GE Global Perspectives)	3	⁴ Elective	3
⁴ Elective	1-3	⁴ 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

¹ 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 150.² 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.³ 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**⁴ 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.

⁵Choose 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.

⁶Students must complete a total of two courses with an SWS attribute.

⁷ 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, optometry or podiatry 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.

<p>Option 1: Statistics (6 credits)</p> <ul style="list-style-type: none"> • STA 216 Intermediate Applied Statistics (3) • STA 310 Intro to Biostatistics (3) OR STA 211 Intro to Survey Sampling (3) OR STA 312 Probability & Statistics (3) 	<p>Option 3: Computer Science – Choose 2 courses (6 credits)</p> <ul style="list-style-type: none"> • CIS 160 Learn to Code in Python (3) OR CIS 161 Computational Science (3) • CIS 231 Problem Solving with Spreadsheets (3) • CIS 335 Data Mining (3)
<p>Option 2: Physics (10 credits)</p> <ul style="list-style-type: none"> • PHY 220 <u>AND</u> PHY 221 General Physics I & II (10) • OR PHY 230 <u>AND</u> PHY 231 Principles of Physics I & II (10) 	

Students in the Genetics Emphasis must complete 11 credits of Biology electives from the list below including at least one (1) lab.

<p>BIO 396 Laboratory Assistant in Genetics w/ lab (1) ¹BIO 422 Animal Development Biology (3) w/lab ²BIO/CMB 485 Molecular Ecology (3) w/lab ¹BIO 357* Environmental Microbiology (4) w/lab ²BIO 423 Plant Biotechnology (3) w/lab BIO 490 Internship (1-3) BIO 499 Research in Biology (1-3)</p> <p>^{1E}BMS 312 Bacterial Genetics (3) ^{1E}BMS 313 Bacterial Genetics Lab (1)</p> <p>CHM 461 Biochemistry (4) CHM 462+SWS Techniques in Biochemistry w/ lab (3)</p> <p>CMB 405 Cell and Molecular Biology (4) CMB 406+SWS Cell and Molecular Bio. Lab (2) ²CMB 411 Genetics of Development & Cancer (3) ²CMB 440 Research Applications in Drosophila Genomics w/ lab (3) CMB 451 Bioinformatics: Tools and Techniques w/ lab (3) ¹CMB 460 Genomics and Molecular Diagnostics w/ lab (3) ¹CMB 426 Research Applications in Nucleic Acids w/ lab (4)</p>	<p>Notes</p> <ul style="list-style-type: none"> • For those interested in microbiology, it is recommended to take one of BIO 357 or BMS 212/213, but not both <p>¹<i>Offered in Fall semesters</i> ²<i>Offered in Winter semesters</i> ^{SS}<i>Offered in spring/summer</i> ^E<i>Offered in Even years</i> ^O<i>Offered in Odd years</i> Numbers in parentheses indicate # of credits</p>
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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 and click on "Schedule Appointment." To find more information on Preprofessional programs, visit www.gvsu.edu/clasadvising/preprofessional.