

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) Prerequisites: High school chemistry, CHM 109, or CHM 115 strongly recommended (CHM 109 or 115 may be taken concurrently)	4 (6)
CHM 125+126 Principles of Chemistry I w/lab (GE Physical Science) Prerequisites: High school chemistry and (MTH 110)	3/1 (6)	CHM 127+128 Principles of Chemistry II w/lab Prerequisites: CHM 125+126 and (MTH 122, 124 or 125 or equivalent by placement or exam)	4/1 (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 127+128	4 (7)	² CHM 234 Biological Chemistry w/lab Prerequisite: CHM 231	4 (7)
OR ² CHM 235+236 Organic Chemistry for Life Sciences I w/lab Prerequisite: CHM 127+128	4/1 (6)	OR ² CHM 237+238 Organic Chem. for Life Sciences II w/lab Prerequisite: CHM 235+236	3/1 (6)
⁵ MTH/STA Requirement (GE Math)	3-4	BIO 355 Human Genetics OR BIO 375 Genetics 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 235/236, CHM 237/238, CHM 461, and PHY 220 + PHY 221. The Pre-Professional emphasis is recommended. Students should consult with a Preprofessional Advisor in the CLAS Academic Advising Center. Those pursuing graduate school in the biological sciences should consult their faculty mentor 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 127/128 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.

⁷May substitute a 3-credit BIO 490 or BIO 499 with mentor 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 125/126 (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.

Option 1: Statistics (6 credits)

- 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)

Option 2: Physics (10 credits)

- PHY 220 **AND** PHY 221 General Physics I & II (10)
- **OR** PHY 230 **AND** PHY 231 Principles of Physics I & II (10)

Option 3: Computer Science – Choose 2 courses (6 credits)

- 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)

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 w/ lab (1)

^{1E}BIO 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)

^{1E}BMS 312 Bacterial Genetics (3)

^{1E}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)

²CMB 411 Genetics of Development & Cancer (3)

¹CMB 414 Molecular Biology of the Gene (3) w/ mentor permission

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)

Notes

- For those interested in microbiology, it is recommended to take one of BIO 357 or BMS 212/213, but not both

¹*Offered in Fall semesters*

²*Offered in Winter semesters*

^{SS}*Offered in spring/summer*

^E*Offered in Even years*

^O*Offered in Odd years*

Numbers in parentheses indicate # of credits

It is imperative to meet with your faculty mentor 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.