

**BIOLOGY-BA OR BS-GENERAL** (FOR PRE-PROFESSIONAL STUDENTS)*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 120</b> General Biology I w/lab Prerequisites: High school chemistry, CHM 109, or CHM 115 strongly recommended (CHM 109 or 115 may be taken concurrently)	4 (6)	<b>BIO 121</b> General Biology II w/lab Prerequisite: MTH 110 (may be taken concurrently) <b>OR BIO 120</b> General Biology I w/lab Prerequisites: High school chemistry, CHM 109, or CHM 115 strongly recommended (CHM 109 or 115 may be taken concurrently)	4 (6) 4 (6)
<b>OR BIO 121</b> General Biology II w/lab Prerequisite: MTH 110 (may be taken concurrently)	4 (6)	<b>CHM 116</b> Principles of Chemistry II w/lab Prerequisites: CHM 115 and (MTH 122 or MTH 125 or MTH 201)	5 (7)
<b>CHM 115</b> Principles of Chemistry I w/lab Prerequisites: High school chemistry and (MTH 110 or MTH 122 or MTH 125 or MTH 201)	4 (6)	<b>MTH 123</b> Trigonometry Prerequisite: MTH 122 or assignment through Grand Valley math placement (MTH 122 may be taken concurrently)	3
<sup>4</sup> <b>MTH 122</b> College Algebra Prerequisite: MTH 110 or assignment through Grand Valley math placement	3	<b>WRT 150</b> Strategies in Writing	4
Gen Ed	3		
<i>Numbers noted within (parentheses) are contact hours</i>	<i>Total</i>	<i>Total</i>	<i>16*</i>
	14		
Year Two			
<b>BIO 215</b> Ecology w/lab ( <i>summer and fall only</i> ) Prerequisites: BIO 120 and BIO 121 (BIO 120 may be taken concurrently)	4 (6)	<b>BIO 210</b> Evolutionary Biology Prerequisites: BIO 120 and BIO 121	3
<b>BMS 208</b> Human Anatomy ( <i>BIO elective</i> ) Prerequisite: BIO 120	3	<sup>1</sup> <b>CHM 242</b> Organic Chemistry for Life Sciences II w/lab Prerequisite: CHM 241	4 (6)
<sup>1</sup> <b>CHM 241</b> Organic Chemistry for Life Sciences I w/lab Prerequisite: CHM 116	5 (7)	<sup>2</sup> <b>BMS 290</b> Human Physiology ( <i>Category II</i> ) Prerequisites: BMS 208 and two semesters of chemistry	3
Gen Ed (PSY 101 recommended)	3	<sup>2</sup> <b>BMS 291</b> Lab in Human Physiology ( <i>Category II</i> ) Prerequisite: BMS 290 or concurrent registration	1 (3)
		<sup>3</sup> MTH Cognate Course	3-4
<i>Total</i>	<i>Total</i>	<i>Total</i>	<i>14-15</i>
	15		
Year Three			
<b>BIO 375</b> Genetics and <b>BIO 376</b> Genetics Laboratory Prerequisites: BIO 120. Concurrent enrollment in BIO 376 is required	4 (6)	<sup>2</sup> <b>BMS 212</b> Introductory Microbiology ( <i>Category V</i> ) Prerequisites: BIO 120 and (CHM 230 or CHM 232 or CHM 241)	3
<sup>1,4</sup> <b>CHM 461</b> Biochemistry I Prerequisites: CHM 242, CHM 247 or CHM 248	4	<sup>2</sup> <b>BMS 213</b> Laboratory in Microbiology ( <i>Category V</i> ) Prerequisite: BMS 212 or concurrent enrollment	1 (4)
<sup>1</sup> <b>PHY 220</b> General Physics I w/lab Prerequisites: MTH 122 and MTH 123	5 (7)	<sup>1</sup> <b>PHY 221</b> General Physics II w/lab Prerequisite: PHY 220	5 (7)
Gen Ed (SOC 101 recommended)	3	Issue	3
		Gen Ed	3
<i>Total</i>	<i>Total</i>	<i>Total</i>	<i>15</i>
	16*		
Year Four			
<b>CMB 405</b> Cell and Molecular Biology Prerequisites: (BIO 375 or 355), BIO 376, and (CHM 232 or CHM 242 or CHM 247) may be taken concurrently	4	<b>BIO 495</b> Perspectives in Biology (Capstone) Prerequisites: Senior Standing and CMB 405 (may be taken concurrently)	3
<sup>6</sup> <b>CMB 406</b> SWS Cell and Molecular Biology Laboratory Prerequisites: CMB 405 (may be taken concurrently)	2 (4)	<sup>2</sup> Category III or IV BIO Elective Course	3-4
<sup>2</sup> Category I BIO Elective Course	3-4	<sup>5</sup> Elective	3
Issue	3	Gen Ed	3
Gen Ed	3	Gen Ed	3
<i>Total</i>	<i>Total</i>	<i>Total</i>	<i>15-16*</i>
	15-16*		

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

<sup>1</sup>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.<sup>2</sup>Students must complete a minimum of 41 credits of Biology coursework. See reverse for required Category elective courses.<sup>3</sup>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.<sup>4</sup>MTH 122/123 are prerequisites for other courses and are not part of the Biology major. MTH 124 and 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](http://www.gvsu.edu/s/mv)**<sup>5</sup> Elective refers to any course that will help you earn the required 120 credits to graduate.<sup>6</sup> Students must complete a total of two courses with an SWS attribute.

**Declaring 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

General Education Categories fulfilled by the Biology major:
Life Science and Physical Science: BIO 120 and CHM 115 (both fulfill lab requirement)
Mathematical Sciences: STA 215, MTH 122, MTH 123, MTH 201

**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.

<p><b>Category I: Plant Organismal Biology</b>            BIO 243 Plant Identification &amp; Natural History (3) w/lab  <sup>2</sup>BIO 303 Plant Morphology (4) w/lab  <sup>2</sup>BIO 313 Plants and Islands (4) w/lab  <sup>1</sup>BIO 323 Aquatic and Wetland Plants (3) w/lab  <sup>1</sup>BIO 333 Systematic Botany (4) w/lab  <sup>1</sup>BIO 383 Plant-Fungal Interactions (4) w/lab  <sup>2</sup>BIO 403 Plant Structure and Function (4) w/lab  <sup>2</sup>BIO 413 Freshwater Algae (3) w/lab  <sup>2</sup>BIO 423 Plant Biotechnology (3) w/lab  <sup>1</sup>BIO 433 Plant Ecology (4) w/lab</p> <p><i>Numbers in parentheses indicate # of credits</i>  <sup>1</sup>Offered in Fall semesters only  <sup>2</sup>Offered in Winter semesters only</p>	<p><b>Category II: Animal Organismal Biology</b>            BMS 208+309 Human Anatomy and Lab (4)            BMS 290+291 Human Physiology and Lab (4)</p>	<p><b>Category III: Principles of Ecology and Evolutionary Biology</b>  <sup>2</sup>BIO 303 - Plant Morphology (4) w/lab  <sup>2</sup>BIO 313 - Plants and Islands (4) w/lab  <sup>1</sup>BIO 333 - Systematic Botany (4) w/lab  <sup>1</sup>BIO 349 - The Darwinian Revolution (3)  <sup>2</sup>BIO 352 - Animal Behavior (3) w/lab  <sup>1</sup>BIO 370 - Marine Biology (3)  <sup>1</sup>BIO 433 - Plant Ecology (4) w/lab  <sup>1</sup>BIO 440 - Limnology (4) w/lab  <sup>1</sup>BIO 450 - Stream Ecology (4) w/lab  <sup>1</sup>BIO 452 - Human Evolution (3)            BIO 460 - Terrestrial Ecosystem Ecology (4) w/lab  <sup>2</sup>BIO 473 - Ecology and Evolution of Plant-Animal Interactions (3)</p>
<p><b>Category IV: Applied Ecology &amp; Evolution</b>  <sup>2</sup>BIO 308/NRM 308 - Wildlife Ecology (4) w/lab  <sup>1</sup>BIO 357 - Environmental Microbiology* (4) w/lab  <sup>1</sup>BIO 362 - Fisheries Biology (3) w/lab  <sup>1</sup>BIO 370 - Marine Biology (3)  <sup>1</sup>BIO 386/NRM 386 - Ecological Restoration &amp; Management (4) w/lab  <sup>2</sup>BIO 402 - Aquatic Insects (3) w/lab  <sup>1</sup>BIO 408/NRM 408 - Wildlife Management (4) w/lab  <sup>1</sup>BIO 440 - Limnology (4) w/lab  <sup>1</sup>BIO 450 - Stream Ecology (4) w/lab  <sup>1</sup>BIO 470 - Conservation Biology (3)  <sup>2</sup>BIO 473 - Ecology and Evolution of Plant-Animal Interactions (3)  <sup>2</sup>BIO 486/NRM 486 - Advanced Restoration Ecology (3)            BIO 407 - Biology and Society: Study Abroad (with advisor's permission)            BIO 417 - International Field Biology (with advisor's permission)            BIO 418 - Regional Field Biology (with advisor's permission)</p>	<p><b>Category V: Biomolecular Processes</b>            BMS 212 and BMS 213* Introductory Microbiology and Lab (4)</p> <p>*Note: students may count BIO 357 or BMS 212/213 towards the Biology degree, but not both</p>	<p><b>Excluded and Restricted Courses:</b>            The following courses may not count towards the Biology major:            BIO 104 - Biology for the 21<sup>st</sup> Century (4)            BIO 105 - Environmental Science (3)            BIO 107 - Great Lakes &amp; 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.  <i>The following course may only count towards the Biology major with advisor's permission.</i>            BIO 355 - Human Genetics (3)</p> <p>The following courses can satisfy part of Gen Ed <i>Issues</i> requirement and may count towards the Biology major <i>after</i> 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)</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-1-140 MAK, 616-331-8585 <http://www.gvsu.edu/clasadvising>

**Pre-Professional Academic Advisors:**

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See <http://gvsu.edu/s/zY> for additional details regarding professional school information, and follow the Pre-Professional Blog: <https://preprofessionallakers.wordpress.com>