

**BIOLOGY-BA OR BS-PRE-VETERINARY***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 Prerequisite: MTH 110 (may be taken concurrently)	4 (6)	<b>BIO 120*</b> General Biology I Prerequisites: High school chemistry, CHM 109, or CHM 115 strongly recommended (CHM 109 or 115 may be taken concurrently)	4 (6)
<b>CHM 115</b> Principles of Chemistry I Prerequisites: High school chemistry and (MTH 110 or MTH 122 or MTH 125 or MTH 201)	4	<b>CHM 116</b> Principles of Chemistry II Prerequisites: CHM 115 and (MTH 122 or MTH 125 or MTH 201)	5 (7)
<sup>2</sup> <b>MTH 122</b> College Algebra Prerequisite: MTH 110 or assignment through Grand Valley math placement	(6) 4 (6)	<b>WRT 150</b> Strategies in Writing Gen Ed	4 3
Gen Ed	3		
<i>*It is strongly recommended that BIO majors take BIO 121 before BIO 120.</i>	3		
<i>Numbers noted within (parentheses) are contact hours</i>	14		16**
<i>Total</i>		<i>Total</i>	
Year Two			
<b>BIO 215</b> Ecology 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>CHM 241</b> Organic Chemistry for Life Sciences I Prerequisite: CHM 116	5 (7)	<b>CHM 242</b> Organic Chemistry for Life Sciences II Prerequisite: CHM 241	4 (6)
<sup>2</sup> <b>MTH 123</b> Trigonometry Prerequisite: MTH 122 or assignment through Grand Valley math placement (MTH 122 may be taken concurrently)	3	<sup>5</sup> BIO Elective Gen Ed	1-3 3
Gen Ed	3	<sup>1</sup> MTH Cognate Course	3-4
<i>Total</i>	15	<i>Total</i>	14-17**
Year Three			
<b>CHM 461</b> Biochemistry I Prerequisites: CHM 242, CHM 247 or CHM 248	4	<b>BIO 375</b> Genetics and <b>BIO 376</b> Genetics Laboratory Prerequisites: BIO 120. Concurrent enrollment in BIO 376 is required	4 (6)
<b>PHY 220</b> General Physics I Prerequisites: MTH 122 and MTH 123	5 (7)	<b>PHY 221</b> General Physics II Prerequisites: PHY 220	5 (7)
<sup>5</sup> Category I BIO Elective Course Gen Ed	3-4 3	Issue Gen Ed	3 3
<i>Total</i>	15-16**	<i>Total</i>	15
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>3</sup> <b>CMB 406</b> SWS Cell and Molecular Biology Laboratory Prerequisites: CMB 405 (may be taken concurrently)	2 (4)	<sup>5</sup> Category II BIO Elective Course	3-4
<b>BIO 357</b> Environmental Microbiology Prerequisite: BIO 120 or instructor permission	4 (6)	<sup>4</sup> Elective	3
<b>OR BMS 212</b> Introductory Microbiology and <b>BMS 213</b> Microbiology and Lab Prerequisites: BIO 120, and CHM 230 or CHM 232 or CHM 241	4 (7)	<sup>4</sup> Elective Gen Ed	3 3
Issue	3		
<i>Total</i>	14	<i>Total</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>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>2</sup>Students must demonstrate competency in college algebra and trigonometry as a prerequisite to veterinary school admission. Consult with your advisor regarding the math requirements for Veterinary school and the Biology major to determine the appropriate courses to take.**To take the Math Proficiency Tests for MTH 122 and/or 123 online, visit this link: [gvsu.edu/s/mv](http://gvsu.edu/s/mv)**

<sup>3</sup> Students must complete a total of two courses with an SWS attribute.

<sup>4</sup> Elective refers to any course that can apply towards the 120 credit needed to graduate.

<sup>5</sup> **Students must complete a minimum of 41 credits of Biology coursework.** If students still do not have 41 credits of Biology coursework after completing both the Biology core requirements (above) and the requirements for their chosen emphasis (below), they should select additional Biology courses from the elective categories, BIO Issues courses, credits in research (BIO 499), or internship credit (BIO 490). Students should consult with a Biology advisor prior to selecting elective courses. **BIO 317 is currently no longer offered and this requirement will be waived for all students until it is permanently removed from the emphasis. Please contact your assigned Biology faculty advisor if you have any questions regarding this arrangement.**

**Declaring the Biology-Pre-Veterinary Medicine Major:**

1. In myBanner, select “Student” > “Student Records” > “Change Major” > “Change Major 1/Program”
2. Choose “Biology-BA or Biology-BS Preveterinary Medicine” from the drop-down box.
3. Click “Submit” and then “Change to New Program”

<b>General Education Categories fulfilled by the Biology major:</b>
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 and II.**

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.

**Classes marked with a \* are recommended for Pre-Vet students.**

**Category I: Plant Organismal Biology**

- BIO 243 Plant Identification & 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

*Numbers in parentheses indicate # of credits*

<sup>1</sup>Offered in Fall semesters only

<sup>2</sup>Offered in Winter semesters only

**Excluded and Restricted Courses:**

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 & 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)

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

**Category II: Animal Organismal Biology**

- <sup>1</sup>BIO 222 Natural History of Vertebrates (3) w/lab\*
- <sup>2</sup>BIO 232 Natural History of Invertebrates (3) w/lab\*
- <sup>1</sup>BIO 272 Insect Biology and Diversity (3) w/lab
- <sup>2</sup>BIO 302 Comparative Vertebrate Anatomy (4) w/lab\*
- <sup>2</sup>BIO 342 Ornithology (3) w/lab\*
- <sup>1</sup>BIO 362 Fisheries Biology (4) w/lab
- <sup>2</sup>BIO 402 Aquatic Insects (3) w/lab
- <sup>1</sup>BIO 412 Mammalogy (4) w/lab\*
- <sup>1</sup>BIO 422 Embryology (3) w/lab\*
- <sup>1</sup>BIO 432 Comparative Animal Physiology (4) w/lab\*
- <sup>1</sup>BIO 444 Herpetology (4) w/lab

- BMS 208+309 Human Anatomy and Lab (4)\*
- BMS 290+291 Human Physiology and Lab (4)\*

**\*Strongly Recommended for Pre-Vet Students**

**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)

**Other Biology Elective Choice for Pre-Vet Students:**

- \*BIO 352 - Animal Behavior (3) (does not count toward Category I or II)

**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 <http://www.gvsu.edu/clasadvising>**

**Biology Pre-Vet Faculty Advisors:**

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**CLAS Academic Advisors:**

Visit [www.gvsu.edu/clasadvising](http://www.gvsu.edu/clasadvising) and click on “Schedule Appointment” with one of the CLAS Biology Pre-Vet Advisors

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