

**BIOLOGY-BA OR BS-SECONDARY EDUCATION (WITH EDUCATION MAJOR AND TEACHABLE MINOR)****CLAS Academic Advising Center Advisor – Heather Chafin – [chafinhe@gvsu.edu](mailto:chafinhe@gvsu.edu) – 616-331-8585**THIS IS A **GENERAL** CURRICULUM GUIDE AND IS NOT APPLICABLE TO EVERY STUDENT. IT IS IMPORTANT TO MEET WITH YOUR ADVISOR.**A 2.7 cumulative GPA in the Biology major is required for admission to the College of Education**

Year One			
BIO 120 General Biology I or BIO 121 General Biology II Prerequisites: High school chemistry, CHM 109, or CHM 115 strongly recommended (CHM 109 or 115 may be taken concurrently)	4	CHM 116 Principles of Chemistry II Prerequisites: CHM 115 and (MTH 122 or MTH 125 or MTH 201)	5
CHM 115 Principles of Chemistry I Prerequisites: High school chemistry and (MTH 110 or MTH 122 or MTH 125 or MTH 201)	4	<sup>1</sup> WRT 150 Strategies in Writing	4
MTH 122 College Algebra Prerequisite: MTH 110 or assignment through Grand Valley math placement	3	BIO 120 General Biology I or BIO 121 General Biology II Prerequisites: High school chemistry, CHM 109, or CHM 115 strongly recommended (CHM 109 or 115 may be taken concurrently)	4
Gen Ed or WRT 098 Writing with a Purpose – Optional <sup>1</sup>	3/4	Gen Ed	3
<i>Total</i>	<i>14/15</i>	<i>Total</i>	<i>16*</i>
Year Two			
BIO 215 General Ecology Prerequisites: BIO 120 and 12 college credits; BIO 121 recommended	4	BIO 375 Genetics and BIO 376 Genetics Laboratory Prerequisites: BIO 120. Concurrent enrollment in BIO 376 is required	4
<sup>2</sup> CHM 231 Introductory Organic Chemistry Prerequisite: CHM 109 or CHM 116	4	<sup>2</sup> CHM 232 Biological Chemistry Prerequisite: CHM 231	4
<b>OR</b> CHM 241 Organic Chemistry for Life Sciences I Prerequisite: CHM 116	5	<b>OR</b> CHM 242 Organic Chemistry for Life Sciences II Prerequisite: CHM 241	4
PSY 101 Introductory Psychology	3	EDF 315 Diverse Perspectives on Education	3
Gen Ed	3	Gen Ed	3
<i>Total</i>	<i>14-15</i>	<i>Total</i>	<i>14</i>
Spring/Summer			
<sup>3</sup> Minor Course	3	<sup>3</sup> Minor Course	3
Year Three			
CMB 405 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	<sup>5</sup> PHY 220 General Physics I Prerequisites: MTH 122 and MTH 123	5
<sup>4</sup> CMB 406 SWS Cell and Molecular Biology Laboratory Prerequisites: CMB 405 (may be taken concurrently)	2	<b>OR</b> PHY 200 Physics for the Life Sciences Prerequisite: MTH 110 or MTH 122 or MTH 201	4
<sup>5</sup> MTH 123 Trigonometry Prerequisite: MTH 122 or assignment through Grand Valley math placement (MTH 122 may be taken concurrently)	3	<sup>6</sup> BIO Elective Course	4
EDI 337 Introduction to Learning and Assessment	3	<sup>3</sup> Minor Course	3
PSY 301 Child Development Prerequisite: PSY 101	3	Issue	3
<i>Total</i>	<i>15</i>	<i>Total</i>	<i>14-15</i>
Spring/Summer			
<sup>3</sup> Minor Courses	6	<sup>3</sup> Minor Course	3
Year Four			
<sup>5</sup> PHY 221 General Physics II Prerequisite: PHY 220	5	BIO 495 Evolutionary Biology (Capstone) Prerequisites: Senior Standing, BIO 120, BIO 121, BIO 215, (BIO 375 or 355), BIO 376, (CHM 231 or 241 or 245)	3
<sup>6</sup> BIO Elective Course	4	<sup>6</sup> BIO Elective Course	3
<sup>7</sup> MTH Cognate Course	3-4	<sup>6</sup> BIO Elective Course	3
Gen Ed or Minor Course	3	Issue	3
		<sup>8</sup> EDS 379 Universal Design for Learning: Secondary Sophomore Standing, EDF 315, and EDI 337. B- or better required.	3
<i>Total</i>	<i>15-16*</i>	<i>Total</i>	<i>15</i>
Year Five			
<b>Teacher Assisting</b>		<b>Student Teaching</b>	
EDI 331 Methods and Strategies of Secondary Teaching	5	EDI 431 Student Teaching: Secondary	8
EDF 310 Organizing and Managing Classroom Environments	3	EDI 432 Student Teaching: Secondary Content	2
EDR 321 Content Area Literacy		EDF 485 The Context of Educational Issues	3
EDT 370 Technology in Education	3	Must be taken with or after EDI 431	
Must be taken with or after EDI 331 but before EDI 431	3		
<i>Total</i>	<i>14</i>	<i>Total</i>	<i>13</i>

See reverse for footnotes

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

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.

Online at: <http://www.gvsu.edu/clasadvising>

<sup>1</sup> Students who self-place into WRT 098 should take this course in the fall semester and then take WRT 150 in the winter semester of their first year. Students who self-place into WRT 150 should normally take this course in the winter semester of their first year.

Students will not need to take WRT 150 if they have earned credit for the course through AP/Dual Enrollment. A grade of C or better is required in WRT 150 in order to satisfy the WRT 150 requirement at GVSU.

<sup>2</sup> If you plan to attend graduate or professional school you will want to complete the CHM 241/242 sequence.

<sup>3</sup> A teachable minor is required for students pursuing secondary teacher certification. See below for minor options.

<sup>4</sup> Students must complete a total of two courses with an SWS attribute.

<sup>5</sup> MTH 122/123 are prerequisites for PHY 220 and are not part of the Biology major. If a student chooses to take PHY 200, MTH 123 does not need to be completed. PHY 221 is not required but students planning to attend graduate school, professional school, or to pursue secondary teacher certification should complete the PHY 220/221 sequence. For students with the Advanced Waiver/Override for Mathematics based on ACT scores, it is **STRONGLY RECOMMENDED** that proficiency in MTH 123 – Trigonometry – be demonstrated by either taking the MTH 123 course or by achieving a passing score on the GVSU math placement test **PRIOR** to taking PHY 220 and 221. To take the math placement test, go to [gvsu.edu/s/mv](http://gvsu.edu/s/mv)

<sup>6</sup> Biology majors must take 13 additional credits of BIO Electives at the 200 level. At least 3 credits must be at the 300-400 level. At least ONE animal biology course and ONE plant biology course. See below for elective options.

<sup>7</sup> Choose one of the following to complete the math cognate for the major: MTH 125: Survey of Calculus, MTH 201: Calculus I, or STA 215: Introductory Applied Statistics.

<sup>8</sup> EDS 379 may be taken prior to the Teacher Assisting Semester but must be completed prior to Student Teaching. Permit required (COE – 616-331-6650).

Biology students can pursue a Bachelor of Arts or Bachelor of Science degree. Students who wish to obtain a BA must fulfill 3<sup>rd</sup> semester proficiency in a foreign language (201 level). The BS degree requirements are incorporated into the major requirements and include BIO 120, BIO 375 and 376, and STA 215.

#### Declaring the Biology Education Major with a teachable Minor:

1. Log into myBanner from the GVSU homepage
2. Once logged in select “Student,” “Student Records,” and then “Change Major”
3. Click on the “Change Major 1/Program” box
4. Click on the down arrow in the box next to “New Major 1/Program,” from here scroll down and choose “Biology Teaching – BA (or) BS Secondary Education”
5. Click “Submit.” The system will automatically declare your 2<sup>nd</sup> major in “Education” and give you the option to declare a minor. Choose an appropriate minor from the list and then click “Change to New Program”

#### General Education Overlap

General Education Categories fulfilled by the Biology Major:	
Life Sciences with Lab: BIO 120	Physical Sciences with Lab: CHM 115
Mathematical Sciences: MTH 122 or MTH 123	
Additional Overlap for Education Majors:	
Social and Behavioral Sciences: PSY 101	U.S. Diversity: EDF 315

#### Teachable Majors and Minors for Secondary Education

Teachable Majors		Teachable Minors	
Biology	Mathematics	Biology-Teaching	History-Teaching
Chemistry	Music (K-12)	Chemistry-Teaching	Mathematics-Secondary Education
Earth/Space Science	Physical Education (K-12)	Computer Science-Teaching	Physical Education-Teaching
English	Physics	Earth/Space Science-Teaching	Physics-Teaching
French	Social Studies	Economics-Teaching	Political Science-Teaching
German	Spanish	English-Teaching	Psychology-Teaching
History	Visual Arts (K-12)	French-Teaching	School Health Education
Latin		Geography-Teaching	Spanish-Secondary Teaching
		German-Teaching	

### Second Major in Education

#### Education Major Prerequisites (9 credits)

**A 2.7 cumulative GPA in the Education Major Prerequisites is required with no grade lower than a C**

— EDF 315 Diverse Perspectives on Education (3)	— PSY 301 Child Development (3)
— EDI 337 Introduction to Learning and Assessment (3)	Prerequisite: PSY 101
Teacher Assisting (14 - 17 credits)	Student Teaching (13 credits)
— EDI 331 Teacher Assisting-Secondary (5)	— EDI 431 Student Teaching, Secondary (8)
— EDF 310 Organizing and Managing Classroom Environments (3)	— EDI 432 Student Teaching, Secondary Content (2)
— EDR 321 Content Area Literacy (3)	— EDF 485 The Context of Educational Issues (3)
— EDT 370 Technology in Education (3)	Must be taken with or after EDI 431
Must be taken with or after EDI 331 but before EDI 431	
— EDS 379 Universal Design for Learning: Secondary (3)	

#### Biology Elective Courses

**All BIO majors require a total of 38 credits of BIO classes, including CMB 405+406**

Plant Biology	Animal Biology	The following courses are excluded from the biology major:
BIO 243 Plant Identification and Natural History (3)	BIO 222 Natural History of Vertebrates (3)	BIO 104 Biology for the 21 <sup>st</sup> Century
BIO 303 Plant Morphology (4)	BIO 232 Natural History of Invertebrates (3)	BIO 105 Environmental Science
BIO 323 Aquatic and Wetlands Plants (3)	BIO 272 Insect Biology and Diversity (3)	BIO 107 Great Lakes and Other Water Resources
BIO 333 Systemic Botany (4)	BIO 302 Comparative Vertebrate Anatomy (4)	BIO 109 Plants in the World
BIO 403 Plant Structure and Function (4)	BIO 342 Ornithology (3)	BIO 205 Genetics for K-8 Pre-Service Teachers
BIO 413 Freshwater Algae (3)	BIO 352 Animal Behavior (3)	Any other biology course whose description prevents it from being used in the major
BIO 423 Plant Biotechnology (3)	BIO 362 Fisheries Biology (4)	<i>Only ONE of the following courses may be counted in the biology major:</i>
BIO 433 Plant Ecology (4)	BIO 402 Aquatic Insects (3)	BIO 309 Plants and Human Health (3)
BIO 473 Ecology and Evolution of Plant-Animal Interactions (3)	BIO 412 Mammalogy (4)	BIO 311 Biological Basis of Society (3)
BIO 573 Plants of the Great Lakes Area (3)-with permission	BIO 422 Embryology (3)	BIO 329 Evolution of Social Behavior (3)
	BIO 432 Comparative Animal Physiology (4)	BIO 349 The Darwinian Revolution (3)
	BIO 572 Field Zoology (3)-with permission	
	BMS 208/309 Human Anatomy and Lab (4)	
	BMS 290/291 Human Physiology and Lab (4)	

**See Catalog for Additional Biology Electives**