

FISHERIES AND AQUATIC SCIENCES-BS

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) CHM 109 Introductory Chemistry (GE Physical Science) OR ¹ 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) Gen Ed (GE Art) or ² WRT 120 (self-placement) Gen Ed (GE Social/Behavioral) OR ³ MTH 122 College Algebra Prerequisite: MTH 110 or assignment through Grand Valley math placement ⁴ Elective <i>*It is strongly recommended that FAS majors take BIO 121 before BIO 120.</i>	4 (6) 4 (6) 4 (6) 3 3 1	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) ¹ CHM 116 Principles of Chemistry II w/lab OR Prerequisites: CHM 115 and (MTH 122 or MTH 125 or MTH 201) CHM 231 Introductory Organic Chemistry w/lab Prerequisite: CHM 109 or CHM 116 NRM 150 Introduction to Natural Resources ² WRT 130 or WRT 150 Strategies in Writing (GE Writing) ⁴ Elective (if needed)	4 (6) 5 (7) 4 (6) 3 3-4 1
<i>Numbers noted within (parentheses) are contact hours</i>	<i>Total</i>	<i>Total</i>	<i>15-16*</i>
Year Two			
BIO 215 Ecology w/lab (<i>summer and fall only</i>) Prerequisites: BIO 121 NRM 250 Resource Measurements and Maps (<i>fall only</i>) STA 215 Intro to Applied Statistics (GE Math) Prerequisite: MTH 110 or equivalent Gen Ed (GE Historical Analysis) or ³ MTH 123 Trigonometry Prerequisite: MTH 122 or assignment through Grand Valley math placement (MTH 122 may be taken concurrently) Gen Ed or ⁴ Elective	4 (6) 3 (5) 3 3 1-3	⁵ MTH 125 Survey of Calculus Prerequisite: MTH 110; or assignment through math placement ² Physical Science Elective w/ lab (CHM 231, CHM 232, GEO 111, PHY 220 or PHY 200) Gen Ed (GE Philosophy & Literature (COM 202 recommended)) Gen Ed (GE Social/Behavioral) ⁴ Elective	3 4-5 3 3 1
<i>Total</i>	<i>14-16*</i>	<i>Total</i>	<i>14-15*</i>
Year Three			
BIO 323* Aquatic and Wetland Plants (<i>fall only</i>) Prerequisites: BIO 121 OR ^{2/5} Issues Gen Ed-SWS (BIO 338-SWS recommended) BIO 451 Stream Ecology (<i>fall even years only</i>) OR BIO 440 Limnology (<i>fall odd years only</i>) Prerequisites: BIO 215 or permission of instructor BIO 362 Biology and Diversity of Fishes (<i>fall only</i>) Prerequisites: BIO 215 Gen Ed (GE Global Perspectives) ⁴ Elective (if needed)	3 (5) 3 4 (6) 4 (6) 4 (6) 3 1	BIO 375 Genetics and BIO 376 Genetics Laboratory BIO 375 Prerequisites: BIO 120 or CMB 155 and 156 BIO 376 Prerequisites: BIO 375 or 355 (either may be taken concurrently) BIO 413* Freshwater Algae (<i>winter odd years only</i>) Prerequisites: BIO 121 and BIO 215 OR ^{2/6} Issues Gen Ed-SWS (BIO 338-SWS recommended) Fisheries & Aquatic Sciences Elective (see below) Gen Ed (GE US Diversity) or ⁴ Elective ⁴ Elective <i>*Only need one of BIO 323 or BIO 413, not both.</i>	4 (6) 3 (5) 3 3-4 3 1-2
<i>Total</i>	<i>15</i>	<i>Total</i>	<i>15</i>
Year Four			
BIO 451 Stream Ecology (<i>fall even years only</i>) OR BIO 440 Limnology (<i>fall odd years only</i>) Prerequisites: BIO 215 or permission of instructor Fisheries & Aquatic Sciences Elective (see below) Fisheries & Aquatic Sciences Elective (see below) Issues Gen Ed (NRM 451 recommended) ⁴ Elective (if needed)	4 (6) 4 (6) 3-4 3-4 3 1-2	BIO 495 Perspectives in Biology (Capstone) OR Prerequisites: Senior Standing ^{2/6} NRM 495 SWS Trends in Natural Resources Mgt Prerequisites: Senior Standing, STA 215, NRM 150 and one upper level NRM course (330, 386, 408, 420, 452 or 462) BIO 402 Aquatic Insects (<i>winter only</i>) Prerequisites: BIO 120 and BIO 121 Fisheries & Aquatic Sciences Elective (see below, if needed) Gen Ed (if needed) or ⁴ Elective Gen Ed (if needed) or ⁴ Elective	3 4 3 (5) 3-4 3 3
<i>Total</i>	<i>15</i>	<i>Total</i>	<i>15-17*</i>

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

¹Students planning to pursue careers in fisheries management, graduate school, or participate in research are advised to take CHM 115 and CHM 116.

²A grade of C or better is required in WRT 130 or 150 and SWS courses in order to satisfy the WRT requirement at GVSU.

³MTH 122 is required for CHM 116. MTH 122 + 123 are required for PHY 220. **Take the Math Proficiency Tests for MTH 122 and/or 123 online:**

www.gvsu.edu/s/mv

⁴Students 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.

⁵ MTH 201 can be used in place of MTH 125.

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

Declaring the Fisheries and Aquatic Sciences Major:

1. In myBanner, select “Student” > “Student Records” > “Change Major” > “Change Major 1/Program”
2. Choose “Fisheries and Aquatic Sciences-BS” from the drop-down box.
3. Click “Submit” and then “Change to New Program”

General Education Categories fulfilled by the Fisheries & Aquatic Sciences major:
Life Science and Physical Science: BIO 120 and CHM 109 or CHM 115 (all fulfill lab requirement)
Mathematical Sciences: STA 215
Philosophy & Literature (recommended): COM 202
Issues (recommended): BIO 338-SWS* and NRM 451*

Fisheries and Aquatic Sciences Electives

Students must complete at least 12 credits from the options below.

Courses marked with a * need approval of a faculty advisor.

Students pursuing American Fisheries Society certification should take NRM 395, NRM 451, and NRM 472. Students interested in aquatic sciences are recommended to select at least 1 genetics course (BIO 475 or BIO 485) and NRM 452. Students interested in marine biology are advised to take BIO 232, BIO 370, GEO 430, and a field course in Marine studies.

BIO 210 – Evolutionary Biology (3)

Prerequisites: BIO 120 and BIO 121

^WBIO 232 – Natural History of Invertebrates (3) w/ lab

Prerequisites: BIO 121

^F BIO 323 – Aquatic and Wetland Plants (3) w/ lab

Prerequisites: BIO 121

^F BIO 370 – Marine Biology (3)

Prerequisites: BIO 121 and BIO 215

^{WO}BIO 413 – Freshwater Algae (3) w/ lab (if not taken for major)

Prerequisites: BIO 121 and BIO 215

BIO 417 – International Field Biology (1-4)*

Prerequisites: Variable and with permission of instructor

BIO 418 – Regional Field Biology (1-4)

Prerequisites: Variable and with permission of instructor

BIO 470 – Conservation Biology (3)

Prerequisites: BIO 215

^{FE} BIO 475 – Population Genetics (3)

Prerequisites: BIO 210 and (either BIO 355 or BIO 375), or by permission

^W BIO 485 – Molecular Ecology (3) w/ lab

Prerequisites: BIO 375

CHM 221 – Survey of Analytical Chemistry (4) w/ lab

Prerequisites: CHM 116 or one full year of general chemistry

^{FE} GEO 430 – Oceanography (3) w/ lab

Prerequisites: GEO 112

^WNRM 395 – GIS Application in Resource Management (3) w/ lab

Prerequisites: GPY 307 or NRM 250

NRM 451 – Natural Resource Policy (3)

Prerequisites: Junior standing and completion of Foundations - Natural Sciences; or permission of instructor. Fulfills one Issues requirement.

^FNRM 452 – Watershed and Wetland Management (4) w/ lab

Prerequisites: MTH 122, NRM 150 and NRM 250

^{WO} NRM 472 – Fisheries Management (3) w/ lab

Prerequisites: BIO 362 and STA 215

^F Offered in Fall

^W Offered in Winter

^{SS} Offered in Spring/Summer

^E Offered in Even years only

^O Offered in Odd years only

Physical Science Electives

Must complete one of the following sequences:

- CHM 109 and CHM 231 and one of CHM 232, GEO 111, PHY 220 or PHY 200
- CHM 115 and CHM 116 and CHM 231

Be active in relevant student clubs, such as the Soil & Water Conservation and Wildlife Clubs. Visit gvsu.campuslabs.com/engage to learn more. More information about the American Fisheries Society certification can be found here, <https://fisheries.org/membership/afs-certification/>. Consult your faculty advisor for more information.

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 an advisor in the CLAS Academic Advising Center, visit www.gvsu.edu/clasadvising and click on “Schedule Appointment.”