

# BIOCHEMISTRY – BS (FOR PREPROFESSIONAL STUDENTS)

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 ( <i>or WRT 150 or Gen Ed</i> ) (GE Life Science) Prerequisite: High school chemistry, CHM 109 or CHM 125+126 strongly encouraged <b>OR CMB 155</b> Introduction to Cell and Molecular Biology (GE Life Science) And <b>CMB 156</b> Discoveries in Cell and Molecular Biology: A Research-Based Laboratory Course Prerequisites: BIO 120 or CMB 155 (may be taken concurrently) <sup>1</sup> <b>CHM 125+126</b> 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) <sup>2</sup> <b>MTH 124</b> Precalculus: Functions and Models Prerequisite: MTH 110 Gen Ed (GE Art) or <sup>3</sup> <b>WRT 120</b> (self-placement)	4 (6) or 4 (6)  4 (6)  3/1 (6) 3	<b>BMS 208</b> Human Anatomy Prerequisite: BIO 120 <sup>1</sup> <b>CHM 127+128</b> Principles of Chemistry II w/lab Prerequisites: CHM 125+126 and (MTH 122 or MTH 124 or MTH 125 or MTH 201) <sup>3</sup> <b>WRT 130 or WRT 150</b> Strategies in Writing (GE Writing) Gen Ed (GE Philosophy & Literature) <sup>4</sup> Elective (if needed)	3  4/1 (7)  3-4 3 1
<i>Numbers noted within (parentheses) are contact hours</i>	<i>Total</i>	<i>Total</i>	15
Year Two			
<sup>5</sup> <b>BMS 290</b> Human Physiology Prerequisites: BMS 208 and two semesters of chemistry <sup>6</sup> <b>CHM 245</b> Principles of Organic Chemistry I ( <i>Fall only</i> ) <sup>6</sup> <b>CHM 246</b> Principles of Organic Chemistry I Lab ( <i>Fall only</i> ) Prerequisites: CHM 127+128; CHM 245 and 246 <b>must</b> be taken concurrently <sup>7</sup> <b>MTH 201</b> Calculus I (GE Math) Prerequisites: MTH 124; or MTH 122 and MTH 123; or proficiency through math placement Gen Ed (GE Global Perspectives)	3 4 1 (4)  4  3	<b>BIO 375</b> Genetics/ <b>BIO 376</b> Genetics Laboratory BIO 375 Prerequisites: BIO 120 or CMB 155 and 156 BIO 376 Prerequisites: BIO 375 or 355 (either may be taken concurrently) <sup>6</sup> <b>CHM 247</b> Principles of Organic Chemistry II ( <i>Winter only</i> ) <sup>6</sup> <b>CHM 248</b> Principles of Organic Chemistry II Lab ( <i>Winter only</i> ) Prerequisites: CHM 245 and CHM 246; CHM 247 and 248 <b>must</b> be taken concurrently PSY 101 (GE Social/Behavioral) Gen Ed (GE US Diversity) <sup>4</sup> Elective	3/1 (6)   3 1 (4)  3 3 1
<i>Total</i>	15*	<i>Total</i>	15
Year Three			
<b>CHM 461</b> Biochemistry I Prerequisites: CHM 237+238 or CHM 247, CHM 248 <sup>7</sup> <b>PHY 220</b> General Physics I Prerequisites: MTH 122 and MTH 123 <sup>5</sup> <b>BMS 391</b> Laboratory in Human Physiology Prerequisite: BMS 290 or 251 and two semesters of chemistry Gen Ed (GE Historical Analysis) <b>CHM 391</b> Chemistry Seminar I Prerequisites: 18 credits of chemistry and junior status	4 5 (7) 2 (3) 3 1	<sup>5</sup> <b>BMS 212</b> Introductory Microbiology Prerequisites: BIO 120 or CMB 155+156 and (CHM 127+128, 230 or 231) <sup>5</sup> <b>BMS 213</b> Laboratory in Microbiology Prerequisite: BMS 212 or concurrent enrollment <sup>7</sup> <b>PHY 221</b> General Physics II Prerequisite: PHY 220 Issue SOC 101 (GE Social/Behavioral)	3  1 (4)  5 (7) 3 3
<i>Total</i>	15	<i>Total</i>	15
Year Four			
<sup>7</sup> <b>CHM 351</b> Introduction to Physical Chemistry ( <i>Fall only</i> ) Prerequisites: CHM 127+128, MTH 201, and PHY 220 (may be taken concurrently) <sup>7</sup> <b>CHM 352</b> Applied Physical Chemistry Prerequisites: CHM 127+128, MTH 201, CHM 351 and PHY 220 (CHM 351 or PHY 220 may be taken concurrently) <b>CHM 221</b> Survey of Analytical Chemistry Prerequisites: CHM 127+128 <sup>4</sup> Elective Issue-SWS	3  1 (3)  4 (7) 3 3	<b>CHM 462</b> SWS Techniques in Biochemistry Prerequisites: CHM 461 or permission of instructor <b>CHM 491</b> Chemistry Seminar II (Capstone) Prerequisites: CHM 391 and senior standing <b>CHM 463</b> Biochemistry II ( <i>Winter only</i> ) Prerequisites: CHM 461 Gen Ed (if any remaining) or <sup>4</sup> Elective <sup>4</sup> Elective <sup>4</sup> Elective	3 (4) 1 3 3 3 2
<i>Total</i>	14	<i>Total</i>	15

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

<sup>1</sup>Chemistry majors who have AP/IB Credit in CHM 125+126 and/or CHM 127+128 are generally better prepared for higher-level chemistry courses if they take CHM 125+126 and CHM 127+128 at GVSU.

<sup>2</sup>MTH 124 is not part of the major but may be required depending on math placement. **To take the Math Proficiency Tests online: [gvsu.edu/s/mv](https://gvsu.edu/s/mv)**

<sup>3</sup>Students who self-place into WRT 120 should take course in the fall and WRT 130 in the winter of their first year. Students won't need to take WRT 150 if they've earned credit for WRT 150 through AP/Dual Enrollment. A grade of C or better is required in WRT 130/150 in order to meet GVSU's WRT requirement

<sup>4</sup> 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.

<sup>5</sup> See below for cognate electives. Students are encouraged to work with their faculty in selecting elective courses.

<sup>6</sup>CHM 235+236 and CHM 237+238 may substitute for CHM 245/246/247/248 with advisor approval.

<sup>7</sup> If planning to attend graduate school, students are advised to consult with their advisor about selecting the following: PHY 230/231 instead of PHY 220/221; CHM 356 and CHM 358 instead of CHM 351; MTH 202 in addition to MTH 201.

### Declaring the Biochemistry Major:

1. In myBanner, select "Student" > "Student Records" > "Change Major" > "Change Major 1/Program"
2. Choose "Biochemistry-BS" from the drop-down box.
3. Click "Submit" and then "Change to New Program"
4. Declare "**Preprofessional**" as your SECOND MAJOR if you are planning on medical/podiatry, dental, pharmacy, or optometry school.  
→ If you are Preveterinary, the **Biology with Pre-Veterinary emphasis** is recommended

General Education Categories fulfilled by the Biochemistry Major:	
Life Sciences with Lab: BIO 120 or CMB 155 (w/o lab)	Physical Sciences with Lab: CHM 125+126
Mathematical Sciences: MTH 124, or MTH 201	
Additional Overlap for Preprofessional Students	
Social and Behavioral Sciences: PSY 101	Social and Behavioral Sciences: SOC 101

### <sup>4</sup>Choose an additional 8 credits in major electives from the following courses:

Check Chemistry department website for most current [course rotation schedule](#) for CHM courses.

BIO 357 Environmental Microbiology (4) Prerequisite: BIO 120 or permission of instructor	CMB 411 Genetics of Development and Cancer (3) Prerequisite: (BIO 375 and 376) or (BIO 355 and CHM 232)
BIO 416 Advanced Genetics Laboratory (2) Prerequisite: BIO 376; BIO 411 or 414 recommended (take concurrently)	CMB 414 Molecular Biology of the Gene (3) Prerequisites: BIO 375 and BIO 376
BIO 423 Plant Biotechnology (3) Prerequisite: BIO 376	CMB 426 Nucleic Acids Laboratory (3) Prerequisite: CMB 406
BIO 432 Comparative Animal Physiology (4) Prerequisites: BIO 121 (or BMS 208), BIO 120, CHM 232 or CHM 237+238	CMB 452 Computational Modeling & Drug Design (3) Prerequisites: BIO 120 (or CMB 155 + 156); CHM 235+236 or 245 (or CHM 231 and 232); (PHY 220 or PHY 230) or permission of instructor
<b>*BMS 212 Intro Microbiology (3) &amp; BMS 213 Lab in Microbiology (1)</b> Prerequisites: BIO 120 or CMB 155+156 and (CHM 127+128, 230 or 231)	CHM 421 - Green Chemistry for Sustainable Environment (3) Prerequisite: One of CHM 231, CHM 237+238, or CHM 247
<b>*BMS 290 Human Physiology (3) &amp; BMS 391 Lab in Human Phys. (2)</b> Prerequisites: 290: BMS 208 and 2 semesters of chemistry; 391: 290 or 251	CHM 427 - Green and Environmental Chemistry Laboratory (3) Prerequisites: CHM 221; CHM 235+236, or CHM 245 and CHM 246
BMS 306 Advanced Human Nutrition Prerequisites: BMS 290 or MOV 304, and CHM 232 or CHM 461	CHM 448 - Advanced Organic Chemistry w/Lab (4) ** Prerequisite: CHM 237+238 or CHM 247+248
BMS 312 Bacterial Genetics (3) & BMS 313 Bacterial Genetics Lab (1) Prerequisites: BMS 212 or BIO 357	CHM 457 - Advanced Physical and Instrumental Chemistry Lab (3) Prerequisites: CHM 221 and CHM 352 (CHM 352 take concurrently)
BMS 410 Immunology (3) Prerequisite: BMS 212; and CHM 232 or CHM 461 (may be taken concurrently)	CHM 475 - Electrochemistry (3) Prerequisites: CHM 125+126 and one of PHY 221, PHY 231, or PHY 234; or permission of instructor
BMS 422 Bacterial Physiology (3) & BMS 423 Bacterial Phys. Lab (2) Prerequisite: BMS 212 or BIO 357	CHM 478 - Advanced Inorganic Chemistry w/Lab (4) *** Prerequisites: CHM 237+238 or CHM 248 and CHM 273
BMS 431 Medical Virology (3) Prerequisite: BMS 212 and CHM 235+236	
CMB 451 Bioinformatics: Tools & Techniques for Life Scientists (3) Prerequisite: Junior Standing, CMB 250 or BIO 375	
CMB 405 Cell and Molecular Biology (4) Prerequisites: (BIO 375 or BIO 355) and BIO 376 and (CHM 232 or CHM 237+238 or CHM 247 may be taken concurrently)	
CMB 406-SWS Cell and Molecular Biology Laboratory (2) Prerequisite: CMB 405 (may be taken concurrently)	

**\*Recommended for Preprofessional Students**

**\*\*Fall Semester Only**

**\*\*\*Winter Semester Only**

It is imperative to meet with your faculty advisor or an advisor in the CLAS Academic Advising Center regularly.

Please Friend the GVSU Chemistry Facebook page: <https://www.facebook.com/gvsu.chemistrystockroom>

The CLAS Academic Advising Center is located in C-1-120 MAK, 616-331-8585

To schedule an appointment with a Biochemistry and/or Preprofessional Advisor in the CLAS Academic Advising Center, visit [www.gvsu.edu/clasadvising](http://www.gvsu.edu/clasadvising) and click on "Schedule Appointment." To find more information on Preprofessional programs, visit [www.gvsu.edu/clasadvising/preprofessional](http://www.gvsu.edu/clasadvising/preprofessional)