COLLEGE OF LIBERAL ARTS AND SCIENCES (CLAS) ACADEMIC ADVISING CENTER 2024-2025

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			
BIO 120 General Biology I *(or WRT 150 or Gen Ed)* (GE Life Science) Prerequisite: High school chemistry, CHM 109 or CHM 115 strongly encouraged	4 *(6)* or 4 *(6)*	**BMS 208** Human Anatomy Prerequisite: BIO 120	3
***OR* CMB 155** Introduction to Cell and Molecular Biology (GE Life Science) And **CMB 156** Discoveries in Cell and Molecular Biology: A Research-Based Laboratory Course Prerequisites: BIO 120 or CMB 155 (may be taken concurrently)	4 *(6)*	[1]**CHM 116** Principles of Chemistry II Prerequisites: CHM 115 and (MTH 122 or MTH 124 or MTH 125 or MTH 201)	5 *(7)*
[1]**CHM 115** Principles of Chemistry I (GE Physical Science) Prerequisites: High school chemistry and (MTH 110 or MTH 122 or MTH 125 or MTH 201)	5	[3]**WRT 130** or **WRT 150** Strategies in Writing (GE Writing)	3-4
[2]**MTH 124** Precalculus: Functions and Models Prerequisite: MTH 110	3	Gen Ed (GE Philosophy & Literature)	3
Gen Ed (GE Art) or [3]**WRT 120** (self-placement)		[4]Elective (if needed)	1
Numbers noted within (parentheses) are contact hours Total	*16**	*Total*	*15*
Year Two			
[5]**BMS 290** Human Physiology Prerequisites: BMS 208 and two semesters of chemistry	3	**BIO 375** Genetics/**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)	3/1 *(6)*
[6]**CHM 245** Principles of Organic Chemistry I *(Fall only)*	4	[6]**CHM 247** Principles of Organic Chemistry II *(Winter only)*	3
[6]**CHM 246** Principles of Organic Chemistry I Lab *(Fall only)* Prerequisites: CHM 116; CHM 245 and 246 **must** be taken concurrently	1 *(4)*	[6]**CHM 248** Principles of Organic Chemistry II Lab *(Winter only)* Prerequisites: CHM 245 and CHM 246; CHM 247 and 248 **must** be taken concurrently	1 *(4)*
[7]**MTH 201** Calculus I (GE Math) Prerequisites: MTH 124; or MTH 122 and MTH 123; or proficiency through math placement	4	PSY 101 (GE Social/Behavioral)	3
Gen Ed (GE Global Perspectives)	3	Gen Ed (GE US Diversity)	3
		[4]Elective	1
Total	*15**	*Total*	*15*
Year Three			
CHM 461 Biochemistry I Prerequisites: CHM 242 or CHM 247, CHM 248	4	[5]**BMS 212** Introductory Microbiology Prerequisites: BIO 120 or CMB 155+156 and (CHM 116, 230 or 231)	3
[7]**PHY 220** General Physics I Prerequisites: MTH 122 and MTH 123	5 *(7)*	[5]**BMS 213** Laboratory in Microbiology Prerequisite: BMS 212 or concurrent enrollment	1 *(4)*
[5]**BMS 391** Laboratory in Human Physiology Prerequisite: BMS 290 or 251 and two semesters of chemistry	2 *(3)*	[7]**PHY 221** General Physics II Prerequisite: PHY 220	5 *(7)*
Gen Ed (GE Historical Analysis)	3	Issue	3
CHM 391 Chemistry Seminar I Prerequisites: 18 credits of chemistry and junior status	1	SOC 101 (GE Social/Behavioral)	3
Total	*15*	*Total*	*15*
Year Four			
[7]**CHM 351** Introduction to Physical Chemistry *(Fall only)* Prerequisites: CHM 116, MTH 201, and PHY 220 (may be taken concurrently)	3	**CHM 462** *SWS* Techniques in Biochemistry Prerequisites: CHM 461 or permission of instructor	3 *(4)*
[7]**CHM 352** Applied Physical Chemistry Prerequisites: CHM 116, MTH 201, CHM 351 and PHY 220 (CHM 351 or PHY 220 may be taken concurrently)	1 *(3)*	**CHM 491** Chemistry Seminar II (Capstone) Prerequisites: CHM 391 and senior standing	1
CHM 221 Survey of Analytical Chemistry Prerequisites: CHM 116	4 *(7)*	**CHM 463** Biochemistry II *(Winter only)* Prerequisites: CHM 461	3
[4]Elective	3	Gen Ed (if any remaining)or [4]Elective	3
Issue-SWS	3	[4]Elective	3
		[4]Elective	2
Total	*14*	*Total*	*15*

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

[1]Chemistry majors who have AP/IB Credit in CHM 115 and/or CHM 116 are generally better prepared for higher-level chemistry courses if they take CHM 115 and CHM 116 at GVSU.

[2] 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***

[3]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

[4] 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.

[5] See below for cognate electives. Students are encouraged to work with their faculty in selecting elective courses.

[6]CHM 241 and CHM 242 may substitute for CHM 245/246/247/248 with advisor approval.

[7] 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 115
Mathematical Sciences: MTH 124, or MTH 201	
Additional Overlap for Preprofessional Students	
Social and Behavioral Sciences: PSY 101	Social and Behavioral Sciences: SOC 101

[4]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

BIO 416 Advanced Genetics Laboratory (2)
Prerequisite: BIO 376; BIO 411 or 414 recommended (take concurrently)

BIO 423 Plant Biotechnology (3)
Prerequisite: BIO 376

BIO 432 Comparative Animal Physiology (4)
Prerequisites: BIO 121 (or BMS 208), BIO 120, CHM 232 or CHM 242

***BMS 212 Intro Microbiology (3) & BMS 213 Lab in Microbiology (1)**
Prerequisites: BIO 120 or CMB 155+156 and (CHM 116, 230 or 231)

***BMS 290 Human Physiology (3) & BMS 391 Lab in Human Phys. (2)**
Prerequisites: 290: BMS 208 and 2 semesters of chemistry; 391: 290 or 251

BMS 306 Advanced Human Nutrition
Prerequisites: BMS 290 or MOV 304, and CHM 232 or CHM 461

BMS 312 Bacterial Genetics (3) & BMS 313 Bacterial Genetics Lab(1)
Prerequisites: BMS 212 or BIO 357

BMS 410 Immunology (3)
Prerequisite: BMS 212; and CHM 232 or CHM 461 (may be taken concurrently)

BMS 422 Bacterial Physiology (3) & BMS 423 Bacterial Phys. Lab (2)
Prerequisite: BMS 212 or BIO 357

BMS 431 Medical Virology (3)
Prerequisite: BMS 212 and CHM 241

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 242 or CHM 247 may be taken concurrently)

CMB 406-SWS Cell and Molecular Biology Laboratory (2)
Prerequisite: CMB 405 (may be taken concurrently)

CMB 411 Genetics of Development and Cancer (3)
Prerequisite: (BIO 375 and 376) or (BIO 355 and CHM 232)

CMB 414 Molecular Biology of the Gene (3)
Prerequisites: BIO 375 and BIO 376

CMB 426 Nucleic Acids Laboratory (3)
Prerequisite: CMB 406

CMB 452 Computational Modeling & Drug Design (3)
Prerequisites: BIO 120 (or CMB 155 + 156); CHM 241 or 245 (or CHM 231 and 232); (PHY 220 or PHY 230) or permission of instructor

CHM 421 - Green Chemistry for Sustainable Environment (3)
Prerequisite: One of CHM 231, CHM 242, or CHM 247

CHM 427 - Green and Environmental Chemistry Laboratory (3)
Prerequisites: CHM 221; CHM 241, or CHM 245 and CHM 246

CHM 441 - Advanced Topics in Organic Chemistry (3) *(combo w/ 447)*
Prerequisite: CHM 242 or CHM 247

CHM 447 - Organic Synthesis and Characterization (3) *(combo w/ 441)*
Prerequisites: CHM 242; or CHM 247 and CHM 248

CHM 457 - Advanced Physical and Instrumental Chemistry Lab (3)
Prerequisites: CHM 221 and CHM 352 (CHM 352 take concurrently)

CHM 471 - Advanced Inorganic Chemistry (3) *(combo w/ 477)*
Prerequisites: CHM 242 or CHM 248; CHM 273; CHM 351 or CHM 356 (CHM 351 or CHM 356 may be taken concurrently).

CHM 477 - Synthetic Inorganic Chemistry (3) *(combo w/ 471)*
Prerequisites: CHM 273 or CHM 471; CHM 242 or CHM 248.

CHM 475 – Electrochemistry (3)
Prerequisites: CHM 115 and one of PHY 221, PHY 231, or PHY 234; or permission of instructor

****Recommended for Preprofessional Students***

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 and click on "Schedule Appointment." To find more information on Preprofessional programs, visit www.gvsu.edu/clasadvising/preprofessional

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