

CHEMISTRY-BA OR BS-BIOCHEMISTRY AND BIOTECHNOLOGY

THIS IS A GENERAL CURRICULUM GUIDE AND IS NOT APPLICABLE TO EVERY STUDENT. IT IS IMPORTANT TO MEET WITH YOUR ADVISOR.

Year One			
CHM 115 Principles of Chemistry I Prerequisites: High school chemistry and (MTH 110 or MTH 122 or MTH 125 or MTH 201)	5	CHM 116 Principles of Chemistry II Prerequisites: CHM 115 and (MTH 122 or MTH 125 or MTH 201)	5
MTH 122 College Algebra Prerequisite: MTH 110 or assignment through Grand Valley math placement	3	BIO 120 General Biology I Prerequisite: High school chemistry, CHM 109 or CHM 115 strongly encouraged	4
WRT 150 Strategies in Writing Gen Ed	4	⁸ MTH 123 Trigonometry Prerequisite: MTH 122 or assignment through Grand Valley math placement (MTH 122 may be taken concurrently) Gen Ed	3
	3		3
Total	15	Total	15
Year Two			
CHM 222 Quantitative Analysis Prerequisites: CHM 116; Corequisite: CHM 241 or CHM 245	3	CHM 225 Instrumental Analysis I Prerequisite: CHM 222	3
¹ CHM 245 Principles of Organic Chemistry I	3	¹ CHM 247 Principles of Organic Chemistry II	3
CHM 246 Principles of Organic Chemistry I Lab Prerequisites: CHM 116; CHM 245 and 246 must be taken concurrently	1	CHM 248 Principles of Organic Chemistry II Lab Prerequisites: CHM 245 and CHM 246; CHM 247 and 248 must be taken concurrently	1
MTH 201 Calculus I Prerequisites: MTH 122 and MTH 123 or assignment through Grand Valley math placement	4	BIO 375 Genetics/ BIO 376 Genetics Laboratory Prerequisites: BIO 120. Concurrent enrollment in BIO 376 is required	3/1
Gen Ed	3	Gen Ed	3
² Elective	1	² Elective	1
Total	15	Total	15
Year Three			
CHM 461 Biochemistry I Prerequisites: CHM 242, CHM 247, or CHM 248	4	³ PHY 221 General Physics II Prerequisite: PHY 220	5
⁴ CHM 391 Chemistry Seminar I	0	⁴ CHM 391 Chemistry Seminar I	1
³ PHY 220 General Physics I Prerequisites: MTH 122 and MTH 123	5	CHM 462 Techniques in Biochemistry Prerequisites: CHM 461 or permission of instructor	3
⁵ Cognate Elective	3	CHM 463 Biochemistry II (Capstone) Prerequisites: CHM 461 & BIO 120 or permission of instructor	3
Gen Ed	3	Issue/Theme	3
Total	15	Total	15
Year Four			
⁶ CHM 351 Introduction to Physical Chemistry Prerequisites: CHM 116, MTH 201, and PHY 220 (may be taken concurrently)	3	^{6, 7} CHM 352 SWS Applied Physical Chemistry Prerequisites: CHM 116, MTH 201, CHM 351 and PHY 220 (may be taken concurrently)	1
⁴ CHM 491 Chemistry Seminar II	0	⁴ CHM 491 Chemistry Seminar II	1
⁵ Cognate Elective	3	⁵ Cognate Elective	3
⁵ Cognate Elective	3	Gen Ed	3
Issue/Theme	3	Gen Ed	3
² Elective	3	² Elective	3
		² Elective	1
Total	15	Total	15

See reverse for notes

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

¹CHM 241 and CHM 242 may substitute for CHM 245/246/247/248.

² Elective refers to any course to help you earn the required 120 credits for graduation.

³ If planning to attend graduate school, PHY 230/231 should be taken in place of PHY 220/221, and MTH 202 should also be taken.

⁴ Required of all chemistry majors. Two semesters of seminar are required for one credit. Students should register for zero credits in their first semester and one credit in their second semester.

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

⁶ Students interested in Graduate School should take CHM 356, 353, 358 and 355 or 455 instead of CHM 351 and 352.

⁷ Students must complete two courses with an SWS attribute.

⁸ 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.

Chemistry students can pursue a Bachelor of Arts or Bachelor of Science degree. Students who wish to obtain a BA must fulfill 3rd semester proficiency in a foreign language (201 level). The BS degree requirements are incorporated into the major requirements.

Declaring the Chemistry-Biochemistry and Biotechnology Major:

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 "Chemistry – **BA (or) BS** Biochemistry and Biotechnology"
5. Click "Submit" and then "Change to New Program"

General Education Overlap

General Education Categories fulfilled by the Chemistry- Biochem and Biotech Major:

Physical Sciences with Lab: CHM 115

Mathematical Sciences: MTH 122 or MTH 123 or MTH 201

Life Sciences with Lab: BIO 120

Choose an additional 10 credits in cognate electives from the following courses:

BIO 406 Cell and Molecular Biology Laboratory (2)

BIO 416 Advanced Genetics Laboratory (2)

Prerequisite: BIO 376; BIO 411 or 414 recommended (may be taken concurrently)

BIO 423 Plant Biotechnology (3)

Prerequisite: BIO 376

CMH 490 Chemistry Laboratory Internship (1-4)

Prerequisites: Chemistry major with a minimum of 20 hours in chemistry and permission of instructor

CHM 499 Investigation Problems (1-5)

Prerequisite: Permission of instructor

Can choose only one from the following:

BIO 426 Nucleic Acids Laboratory (3)

Prerequisite: BIO 406

BMS 312 Bacterial Genetics (3) and BMS 313 Bacterial Genetics Laboratory (1)

Prerequisites: BMS 212 or BIO 357, and BIO 355 or BIO 375

BMS 322 Bacterial Physiology (3) and BMS 323 Bacterial Physiology Laboratory (1)

Prerequisite: BMS 212 or BIO 357

Can choose only one from the following:

BIO 357 Environmental Microbiology (4)

Prerequisite: BIO 120 or permission of instructor

BMS 212 Introductory Microbiology (3) and BMS 213 Laboratory in Microbiology (1)

Prerequisites: BIO 120 and (CHM 230 or 232 or 241)

Can choose only one from the following:

BIO 432 Comparative Animal Physiology (4)

Prerequisites: BIO 121 (or BMS 208), BIO 120, CHM 232 or CHM 242

BMS 290 Human Physiology (3) and BMS 291 Laboratory in Human Physiology (1)

Prerequisites: BMS 208 and two semesters of chemistry

Can choose only one from the following:

BIO 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)

BIO 414 Molecular Biology of the Gene (3)

Prerequisites: BIO 375 and BIO 376

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