

CELL AND MOLECULAR BIOLOGY-BS

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

Year One			
⁷ BIO 120 General Biology Prerequisites: High school chemistry, CHM 109, or CHM 115 strongly recommended (CHM 109 or 115 may be taken concurrently)	4 (6)	⁷ CHM 116 Principles of Chemistry II Prerequisites: CHM 115 and (MTH 122 or MTH 125 or MTH 201)	5 (7)
⁷ CHM 115 Principles of Chemistry or CHM 180 Prerequisites: High school chemistry and (MTH 110 or MTH 122 or MTH 125 or MTH 201)	4 (6)	⁶ MTH 123 Trigonometry Prerequisite: MTH 122 or assignment through Grand Valley math placement (MTH 122 may be taken concurrently)	3
⁶ MTH 122 College Algebra Prerequisite: MTH 110 or assignment through Grand Valley math placement	3	WRT 150 Strategies in Writing Gen Ed	4 3
Gen Ed	3		
Elective	1		
<i>Numbers noted within (parentheses) are contact hours</i> Total	15	Total	15
Year Two			
² CHM 241 Organic Chemistry for Life Sciences I Prerequisite: CHM 116	5 (7)	BIO 375 Genetics Prerequisites: BIO 120; concurrent enrollment in BIO 376	3
CMB 250 Introduction to Biotechnology Prerequisites: BIO 120 and CHM 116	3	BIO 376 Genetics Laboratory Prerequisite: Concurrent enrollment in BIO 375 or successful completion of BIO 355	1 (3)
¹ MATH/Physics Sequence (option A or B)	4-5	² CHM 242 Organic Chemistry for Life Sciences II Prerequisite: CHM 241	4 (6)
STA 215 Introductory Applied Statistics Prerequisite: MTH 110 or equivalent	3	¹ Physics Sequence Gen Ed	4-5 3
Total	15-16	Total	15-16
Year Three			
CMB 405 Cell and Molecular Biology Prerequisites: (BIO 375 or BIO 355) and BIO 376, and (CHM 232 or 242 or 247—may be taken concurrently)	4	CHM 462 Techniques in Biochemistry Prerequisite: CHM 461 or permission of instructor	3 (7)
⁵ CMB 406 Cell and Molecular Biology Laboratory SWS Prerequisites: CMB 405 (may be taken concurrently)	2 (4)	CMB 490 Internship Prerequisite: Permission of instructor and program director	2
CHM 461 Biochemistry I Prerequisite: CHM 242, CHM 247, or CHM 248	4	OR CMB 499 Research in Cell and Molecular Biology Prerequisite: Permission of instructor and program director	2
¹ Physics Sequence	5	⁴ Microbiology course (option A or B) ^{1,3} Physics Sequence or Elective Issue	4 3-5 3
Total	15	Total	15-17
Year Four			
CMB 426 Nucleic Acids Laboratory Prerequisite: CMB 406	3 (6)	CMB 495 Perspectives in Cell & Molecular Biology (capstone) Prerequisite: CMB 499, BIO 499, BMS 499, or CHM 499	3
CMB 490 Internship Prerequisite: Permission of instructor and program director	1	Gen Ed	3
OR CMB 499 Research in Cell and Molecular Biology Prerequisite: Permission of instructor and program director	1	Gen Ed	3
Issue	3	³ Elective	3
Gen Ed	3	³ Elective	3
Gen Ed	3		
³ Elective	3		
Total	16	Total	15

¹ Students must select a math/physics option A or B. MTH 122 and 123 must be completed or waived prior to beginning either option.

Option A: MTH 125 Survey of Calculus, PHY 220 General Physics I, and PHY 221 General Physics II

Option B: MTH 201 Calculus I, MTH 202 Calculus II, PHY 230 Principles of Physics I, and PHY 231 Principles of Physics II

² Students may choose CHM 245, 246, 247, and 248 in place of CHM 241 and 242

³ Elective refers to any course that will help you earn the required 120 credits to graduate; see list on reverse for suggested elective courses

⁴ Select a microbiology course option A or B. **Option A:** BIO 357 Environmental Microbiology; **Option B:** BMS 212/213 Introductory Microbiology with lab

⁵ Students must complete a total of two courses with an SWS attribute

⁶ Math proficiency exams are available for MTH 122 and MTH 123. **To take the Math Proficiency Tests online, visit this link: gvsu.edu/s/jk**

⁷CMB majors who have AP/IB Credit in BIO 120, CHM 115 and/or CHM 116 are generally better prepared for higher level courses if they take BIO 120, CHM 115 and CHM 116 at GVSU. CHM 180 is recommended prior to CHM 115 if chemistry was not taken in high school or if the ACT science subscore is below 22. However, CHM 180 does NOT count toward the CMB major and has a corequisite of MTH 110.

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

Declaring the Cell and Molecular Biology Major:

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

General Education Overlap

General Education Categories fulfilled by the Cell and Molecular Biology Major:	
Life Sciences with Lab: BIO 120	Physical Sciences with Lab: CHM 115
Mathematical Sciences: STA 215, MTH 122, MTH 123	
Additional Overlap for Pre-Professional Students	
Social and Behavioral Sciences: PSY 101	Social and Behavioral Sciences: SOC 201

Pre-Professional Students

(Pre-Chiropractic, Pre-Dental, Pre-Medical, Pre-Optometry, Pre-Pharmacy, Pre-Podiatry, & Pre-Veterinary)

Keep in mind that you may major in anything so long as you complete the prerequisites for your professional program.

The AAMC has approved changes to the MCAT exam starting in March 2015 that will add emphasis on the social and behavioral sciences, scientific inquiry and reasoning skills, and introductory biochemistry.

Cell and Molecular Biology Suggested Elective Courses		
BIO 403 Plant Structure and Function BIO 416 Advanced Genetics Laboratory BIO 422 Embryology BIO 423 Plant Biotechnology BIO 432 Comparative Animal Physiology BMS 208 Human Anatomy BMS 290 Human Physiology BMS 291 Laboratory in Human Physiology	BMS 310 Basic Pathophysiology BMS 311 Pharmacological Aspects of Biomedical Sciences BMS 312 Bacterial Genetics BMS 313 Bacterial Genetics Laboratory BMS 322 Bacterial Physiology BMS 323 Bacterial Physiology Laboratory BMS 410 Immunology BMS 411 Immunology Laboratory	BMS 431 Medical Virology CMB 411 Genetics of Development and Cancer CMB 351 Bioinformatics: Tools and Techniques for Life Sciences CMB 440 Drosophila Genomics Research CMB 452 Computational Biology CHM 351 Introduction to Physical Chemistry CHM 463 Biochemistry II PHY 320 Optics

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

<http://www.gvsu.edu/clasadvising> (Also find us on Orgsync, Facebook, and Twitter!)

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See <http://gvsu.edu/s/zY> for additional details regarding professional school information.
Follow the Pre-Professional Blog: <https://preprofessionallakers.wordpress.com>