

ABOUT Cell & Molecular Biology - Biochemistry Option:

Biochemistry is a fundamental science focusing on the understanding of living systems from a physical and chemical perspective. The biochemistry option emphasizes the study of cells and multicellular organisms through the lens of the molecular-level characterization of all biological macromolecules in order to define their structures and functions. The requirements for this option include focused biochemistry specialty courses in proteins, enzymes and physical chemistry, plus laboratory courses that emphasize modern methods used to purify and physically and/or functionally characterize biological macromolecules; such as DNA, RNA, proteins, lipids, and carbohydrates.

Step 1: REVIEW YOUR PROGRAM REQUIREMENTS

Cell & Molecular Biology (CMB) - BIOCHEMISTRY					36-42 Credits
Concentration Courses					(30-36 Credits)
Course Name	Course #	Semester	Credits	Grade	
Introductory Microbiology	CMB 211		4		
Introductory Biochemistry	CMB 311		3		
Immunology and Serology	CMB 333	Fall _____	3		
General Genetics	CMB (BIO) 352		4		
Introductory Biochemistry Lab or Advanced Biochemistry Lab I (preferred)	CMB 312 or CMB 412	Spring _____	2-3		
Physical Biochemistry	CMB 421	Spring _____	3		
Fundamentals of Molecular Biology	CMB (BIO) 437	Fall _____	3		
Proteins and Enzymes	CMB 482	Spring _____	3		
Research in Cell and Molecular Biology	CMB 491 (fall) or 492(spring)		1-6		
Seminar in Cell and Molecular Biology	CMB 495	Fall _____	1		
Biological Sciences (BIO)					(3 Credits)
Course Name	Course #	Semester	Credits	Grade	
Principles of Cell Biology	BIO 341	Fall _____	3		
Professional Electives:					(3 Credits)
Select an additional 3 credits from from the following: BIO 242; CMB 413, 414, 435, 450, or 522; BPS 535; PHY 430					
Course Name	Course #	Semester	Credits	Grade	

Minimum 2.0 cumulative GPA required in major and overall for graduation.

Major GPA = _____

Overall GPA = _____

***Course fulfills general education and a major requirement**

Step 1: REVIEW YOUR PROGRAM REQUIREMENTS CONTINUED:

Introduction Requirement: (1 credit)			
Course	Semester	Credits	Grade
URI 101		1	

Biology (8 credits)			
Course	Semester	Credits	Grade
*BIO 101		3	
*BIO 103		1	
*BIO 102		3	
*BIO 104		1	

CHEMISTRY Requirement: (15-16 credits)			
Course	Semester	Credits	Grade
*CHM 101		3	
CHM 102		1	
OR			
CHM 191		5	

AND

Course	Semester	Credits	Grade
CHM 112		3	
CHM 114		1	
OR			
CHM 192		5	

AND

Course	Semester	Credits	Grade
CHM 227		3	
CHM 228		3	
CHM 226		2	

FREE ELECTIVES			
Course	Semester	Credits	Grade

MATH Requirement: (6-8 credits)			
Course	Semester	Credits	Grade
*MTH 131		3	

OR

*MTH 141 <i>(preferred)</i>		4	
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AND 1 OF THE FOLLOWING: *111, 132, *142
(preferred); *CSC 201; STA 307, or 308

Course	Semester	Credits	Grade

PHYSICS Requirement: (8 credits)

Course	Semester	Credits	Grade
*PHY 111		3	
*PHY 185		1	

OR

*PHY 203 <i>(preferred)</i>		3	
*PHY 273 <i>(preferred)</i>		1	

AND

Course	Semester	Credits	Grade
*PHY 112		3	
*PHY 186		1	

OR

*PHY 204 <i>(preferred)</i>		3	
*PHY 274 <i>(preferred)</i>		1	

*Course fulfills general education and a major requirement

General Education Guidelines:

General education is 40 credits. Each of the twelve outcomes (A1-D1) must be met by at least 3 credits. A single course may meet more than one outcome, but cannot be double counted towards the 40 credit total. At least one course must be a Grand Challenge (G). No more than twelve credits can have the same course code. General education courses may also be used to meet requirements of the major or minor when appropriate.

LIST COURSES THAT MEET GENERAL EDUCATION:

General Education Credit Count						
At least 40 credits, no more than 12 credits with the same course code						
Course	Credits	Grade		Course	Credits	Grade
*BIO 101	3					
*BIO 103	1					
*BIO 102	3					
*BIO 104	1					
*CHM 101	3					
*MTH ____						
*PHY ____	3					
*PHY ____	1					
*PHY ____	3					
*PHY ____	1					
				Total Gen Ed Credits		

LIST COURSE AS EACH OUTCOME IS MET:

General Education Outcome Audit	
	Course
KNOWLEDGE	
A1. STEM	BIO 101
A2. Social & Behavioral Sciences	
A3. Humanities	
A4. Arts & Design	
COMPETENCIES	
B1. Write effectively	
B2. Communicate effectively	
B3. Mathematical, statistical, or computational strategies	MTH ____
B4. Information literacy	
RESPONSIBILITIES	
C1. Civic knowledge & responsibilities	
C2. Global responsibilities	
C3. Diversity & Inclusion	
INTEGRATE & APPLY	
D1. Ability to synthesize	
GRAND CHALLENGE	
G. At least one course of your 40 credits is an approved "G" course	

NOTE: BECAUSE MOST COURSES MEET MORE THAN ONE OUTCOME, YOUR OUTCOME AUDIT MIGHT BE COMPLETED BEFORE YOU REACH YOUR 40 CREDITS. HOWEVER, YOU MUST STILL COMPLETE 40 CREDITS OF GENERAL EDUCATION

*course fulfills general education and a major requirement

The requirement for transfer to CELS from University College for Academic Success is:

Minimum 30 credits and a minimum cumulative gpa of 2.0 or better.

Advising Notes: _____

B.S. Cell & Molecular Biology -Biochemistry Option

Sample 4 Year Plan - Effective Fall 2018

College of the Environment & Life Sciences

Freshman Year *Fall* Semester

Course Code	Description	Cr
URI 101	Planning for Academic Success	1
*BIO 101/103	Principles of Biology I/Lab	4
*MTH ____	Precalculus, Applied Calculus I, or Introductory Calculus	3-4
*CHM 101/102	General Chemistry I/Lab	4
	*General Education	3-4
		15-17

Freshman Year *Spring* Semester

Course Code	Description	Cr
*BIO 102/104	Principles of Biology II/Lab	4
*CHM 112/114	General Chemistry II/Lab	4
	2nd required CSC, MTH, or STA course	3-4
	*General Education	3-4
	*General Education	3-4
		15-17

Year 1 Milestones: Complete **BIO** 101, 103, 102, 104, **CHM** 101, 102, 112, 114, **MTH** 131 or 141. Earn 30 credits with a cumulative GPA of 2.0 or higher.

Sophomore Year *Fall* Semester

Course Code	Description	Cr
CHM 227	Organic Chemistry Lecture I	3
CMB 211	Introductory Microbiology	4
*PHY ____	General Physics I Lecture/Lab	4
	*General Education	3-4
	*General Education	3-4
		15-17

Sophomore Year *Spring* Semester

Course Code	Description	Cr
CHM 228	Organic Chemistry Lecture II	3
CMB 311	Introductory Biochemistry Lecture	3
*PHY ____	General Physics II Lecture/Lab	4
	Professional Elective	3
	*General Education	3-4
		15-17

Year 2 Milestones: Complete **CMB** 211, and 311. Begin Organic Chemistry sequence. Begin Physics sequence. Meet with a CMB Faculty advisor to discuss research opportunities and plan year 3 and 4 courses. Earn 60 total credits with a cumulative GPA of 2.0 or higher.

Junior Year *Fall* Semester

Course Code	Description	Cr
CHM 226	Organic Chemistry Lab	2
CMB 333	Immunology and Serology	3
<i>BIO 341</i>	<i>Cell Biology</i>	3
CMB 312	Introductory Biochemistry Lab	2
	*General Education/Free Elective	3-4
		15-17

Junior Year *Spring* Semester

Course Code	Description	Cr
CMB 352	General Genetics	4
<i>CMB 421</i>	<i>Physical Biochemistry</i>	3
	*General Education/Free Elective	3-4
<i>CMB 312 or 412</i>	<i>Introductory Biochemistry Lab or Advanced Biochemistry Lab</i>	2-3
		15-17

Year 3 Milestones: Complete *BIO 341 (341 is only taught in the Fall semester)* *CMB 312 (312, 412, 421, 437, & 482 are only taught in the Spring)*, 333, & 352.. Complete Organic Chemistry sequence. Meet with a CMB Faculty advisor to plan year 4 courses. Earn 90 total credits with a cumulative GPA of 2.0 or higher. Prepare intent to graduate with faculty advisor for Fall submission.

Senior Year *Fall* Semester

Course Code	Description	Cr
CMB 495	Seminar in Cell & Molecular Biology	1
CMB 491	Research in Cell and Molecular Biology	1-6
	*General Education/Free Elective	3-4
	*General Education/Free Elective	3-4
		15-17

Senior Year *Spring* Semester

Course Code	Description	Cr
CMB 492	Research in Cell and Molecular Biology	1-6
<i>CMB 437</i>	<i>Fundamentals of Molecular Biology</i>	3
<i>CMB 482</i>	<i>Proteins and Enzymes</i>	3
	*General Education/Free Elective	3-4
		15-17

Year 4 Milestones: Complete **CMB** remaining biochemistry concentration courses. Earn total 120 credits with a cumulative GPA of 2.0 or higher. Minimum 2.0 cumulative gpa in CMB concentration courses.