Cell & Molecular Biology B.S.
Bioinformatics Option
EL_CMBI_BS
120 Earned Credits Total

THE UNIVERSITY OF RHODE ISLAND

Student: _____
Student ID: _____
Advisor: _____

ABOUT Cell & Molecular Biology - Bioinformatics Option:

This option provides an interdisciplinary curriculum that trains students in cell and molecular biology, computer sciences, and provides an integration of these two broader areas. Graduates from this program can pursue their next degree in a variety of biological, computational, and bioinformatics programs. There are currently over fifty graduate-level degree programs and certificate programs in Bioinformatics and Computational Biology in the United States. Our students should be competitive applicants to enter many of these graduate programs.

Step 1: REVIEW YOUR PROGRAM REQUIREMENTS

Cell & Molecular Biology (CMB) - BIOINFORMATICS				**40 Credits Total**
Concentration Courses				**(18 Credits)**
Course Name	**Course #**	**Semester**	**Credits**	**Grade**
Integrative Microbiology	*CMB 211		4	
Introductory Biochemistry	CMB 311		3	
Intro. Computational Biology	CMB 320		3	
General Genetics	CMB (BIO) 352		4	
Molecular Sequence Analysis	CMB 450		3	
Seminar in Cell and Molecular Biology	CMB 495		1	
Select 1 credit CMB laboratory coursework at the 300 or 400 level				**(1 Credit)**
Course Name	**Course #**	**Semester**	**Credits**	**Grade**
Computer Sciences (CSC)				**(12 Credits)**
Course Name	**Course #**	**Semester**	**Credits**	**Grade**
Introduction to Computer Programming	***CSC 201 or CSC 106** or other prerequisites of CSC 211		4	
Object-Oriented Programming	CSC 211		4	
Data Structures and Abstractions	CSC 212		4	

Professional Electives: *Select 9 credits from any 300 level or higher CMB course; or from the following list of approved electives* **(9 Credits)**

Course #	**Course Name**	**Course #**	**Course Name**
BIO 341	Principles of Cell Biology	**CSC 412**	Operating Systems and Networks
BPS 535	Pharmaceutical Biotechnology	**CSC 415**	Introduction to Parallel Computing
PHY 430	Modern Biological Physics	**CSC 436**	Database Management Systems
CSC 305	Software Engineering	**CSC 440**	Design and Analysis of Algorithms
CSC 310	Programming for Data Science	**CSC 491/492**	Independent Research
CSC 320	Social Issues in Computing		

Course #	**Semester**	**Credits**	**Grade**

***Course approved for general education.**
Minimum 2.0 cumulative GPA required in major for graduation.
Minimum overrall 2.0 cumulative GPA required for graduation.
120 earned credits required for graduation.
Major GPA = _____

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:			(16-18 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 ***Preferred***		4	

AND 1 OF THE FOLLOWING: MTH *111, 132, *142; *CSC 201; STA 307, 308, or 409

Course	**Semester**	**Credits**	**Grade**

PHYSICS Requirement:			(8 credits)
Course	**Semester**	**Credits**	**Grade**
*PHY 111		3	
*PHY 185		1	
OR			
*PHY 203		3	
*PHY 273		1	

AND

Course	**Semester**	**Credits**	**Grade**
*PHY 112		3	
*PHY 186		1	
OR			
*PHY 204		3	
*PHY 274		1	

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

Cell & Molecular Biology - B.S. **THE UNIVERSITY OF RHODE ISLAND** Student: _____

Bioinformatics Option Student ID: _____

120 Total Earned Credits Advisor: _____

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 111	3					
*PHY 185	1					
*PHY 112	3					
*PHY 186	1					
*CSC 201	4					
*CMB 211	4			Total Gen Ed Credits		

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**

LIST COURSE AS EACH OUTCOME IS MET:

General Education Outcome Audit		
	Course	**Grade**
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	CSC 201	
B4. Information literacy		
RESPONSIBILITIES		
C1. Civic knowledge & responsibilities		
C2. Global responsibilities		
C3. Diversity & Inclusion		
INTEGRATE & APPLY		
D1. Ability to synthesize	CMB 211	
GRAND CHALLENGE		
G. At least one course of your 40 credits is an approved "G" course		

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 - Bioinformatics Option
Sample 4 Year Plan - Effective Fall 2020
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
*CHM 101/102	General Chemistry I/Lab	4
*MTH ___	Applied Calculus I, or Introductory Calculus	3-4
	*General Education	3-4
		15-17

Freshman Year *Spring* Semester

Course Code	Description	Cr
MTH/STA	2nd Required MTH/STA course	3-4
*BIO 102/104	Principles of Biology II/Lab	4
*CHM 112/114	General Chemistry II/Lab	4
*CSC 201	Introduction to Computer Programming	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.

Sophmore Year *Fall* Semester

Course Code	Description	Cr
*CMB 211	Integrative Microbiology	4
CSC 211	Object-Oriented Programming	4
*PHY 111/185	General Physics I/Lab	4
	*General Education	3-4
		15-17

Sophmore Year *Spring* Semester

Course Code	Description	Cr
CHM 227	Organic Chemistry I	3
CSC 212	Data Structures and Abstractions	4
*PHY 112/186	General Physics II/Lab	4
	*General Education	3-4
		15-17

Year 2 Milestones: Complete **CMB** 211 and **CSC** 201. Begin Organic Chemistry sequence. Begin computer science core courses. 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
CMB 352	General Genetics	4
CMB 311	Intro Biochemistry Lecture	3
CHM 226	Organic Chemistry Lab	2
CHM 228	Organic Chemistry II	3
	*General Education	3-4
		15-17

Junior Year *Spring* Semester

Course Code	Description	Cr
CMB 320	*Intro Computational Biology*	*3*
CMB_____	CMB Required Lab Course	1
	Professional Elective	3-4
	Professional Elective	3-4
	*General Education/Free Elective	3-4
		15-17

Year 3 Milestones: Complete **CMB** 311, 352, 320 (***320 is only taught in the Spring semester***), **CSC** 211. Complete Organic Chemistry sequence. Meet with a CMB and CSC Faculty advisors to plan year 3 and 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 450	*Practical Tools for Molecular Sequence and Anaylsis*	*3*
	Professional Elective	3-4
	*General Education/Free Elective	3-4
		15-17

Senior Year *Spring* Semester

Course Code	Description	Cr
	Professional Elective	3-4
	Professional Elective	3-4
	Free Elective	3-4
	*General Education/Free Elective	3-4
	*General Education/Free Elective	3-4
		15-17

Year 4 Milestones: Complete **CMB** 450, 495 (***450 is only taught in the Fall semester***), CSC 212. Earn total 120 credits with a cumulative GPA of 2.0 or higher. Minimum 2.0 cumulative gpa in CMB concentration courses.