Cell \& Molecular Biology B.S.
Bioinformatics Option

## THE UNIVERSITY OF RHODE ISLAND

$\qquad$

EL_CMBI_BS
Student ID:
Advisor:
$\qquad$

120 Earned Credits Total

## 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 |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :---: | :---: | :---: |
| CMB 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 | Semester | Credits | Grade |
| :--- | :--- | :---: | :---: |
| Course |  | 3 |  |
| *BIO 101 |  | 1 |  |
| *BIO 103 |  | 3 |  |
| *BIO 102 |  | 1 |  |
| *BIO 104 |  |  |  |


| CHEMISTRY Requirement: | (16-18 credits) |  |  |
| :--- | :---: | :---: | :---: |
| Course | Semester | Credits | Grade |
| ${ }^{*}$ CHM 101 |  | 3 |  |
| CHM 102 |  | 1 |  |
| OR |  |  |  |

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

| FREE ELECTIVES | Semester | Credits | Grade |
| :--- | :--- | :--- | :--- |
|  |  |  |  |
|  |  |  |  |

[^0]Cell \& Molecular Biology - B.S. THE UNIVERSITY OF RHODE ISLAN[
Student:
Bioinformatics Option
Student ID: $\qquad$
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 | BIO 101 |  |
| A1. STEM |  |  |
| A2. Social \& Behavioral Sciences |  |  |
| A3. Humanities |  |  |
| A4. Arts \& Design |  |  |
| COMPETENCIES | CSC 201 |  |
| B1. Write effectively |  |  |
| B2. Communicate effectively |  |  |
| B3. Mathematical, statistical, or <br> Computational strategies |  |  |
| B4. Information literacy |  |  |
| RESPONSIBILITIES |  |  |
|  <br> responsibilities |  |  |
| C2. Global responsibilities |  |  |
| C3. Diversity \& Inclusion | CMB 211 |  |
| INTEGRATE \& APPLY |  |  |
| D1. Ability to synthesize |  |  |
| 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:
$\qquad$

## B.S. Cell \& Molecular Biology - Bioinformatics Option <br> Sample 4 Year Plan - Effective Fall 2022 <br> College of the Environment \& Life Sciences

Freshman Year Fall Semester

| Course Code | Description | $\mathbf{C r}$ |
| :--- | :--- | :---: |
| 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 | $3-4$ |

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 | $3-4$ |

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 | $\mathbf{C r}$ |
| :--- | :--- | :---: |
| *CMB 211 | Integrative Microbiology | 4 |
| CSC 211 | Object-Oriented Programming | 4 |
| *PHY 111/185 | General Physics I/Lab | 4 |
|  | *General Education | $3-4$ |
|  |  | $\mathbf{1 5 - 1 7}$ |

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 | $3-4$ |

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 | $\mathbf{C r}$ |
| :--- | :--- | :---: |
| 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 | $3-4$ |
|  |  | $\mathbf{1 5 - 1 7}$ |

Junior Year Spring Semester

| Course Code | Description | $\mathbf{C r}$ |
| :--- | :--- | :---: |
| CMB 320 | Intro Computational Biology | 3 |
| CMB | CMB Required Lab Course | 1 |
|  | Professional Elective | $3-4$ |
|  | Professional Elective | $3-4$ |
|  | *General Education/Free Elective | $3-4$ |
|  |  | $\mathbf{1 5 - 1 7}$ |

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 |  |  | Senior Year Spring Semester |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Course Code | Description | Cr | Course Code | Description | Cr |
| CMB 495 | Seminar in Cell \& Molecular Biology | 1 |  | Professional Elective | 3-4 |
| CMB 450 | Practical Tools for Molecular Sequence and Anaylsis | 3 |  | Professional Elective | 3-4 |
|  |  |  |  | Free Elective | 3-4 |
|  | Professional Elective | 3-4 |  | *General Education/Free Elective | 3-4 |
|  | *General Education/Free Elective | 3-4 |  | *General Education/Free Elective | 3-4 |
|  |  | 15-17 |  |  | 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.


[^0]:    *Course fulfills general education and a major requirement

