# BACHELOR OF SCIENCE DEGREE IN MOLECULAR AND CELLULAR BIOLOGY
## Systems and Big Data Biology Sub-Plan

**NAME** _____ **SID #** _____

**CATALOG YEAR 2019-2020** **EXPECTED GRADUATION DATE** _____

### GENERAL EDUCATION REQUIREMENTS

**English Composition**
ENGL 101 or 107 ..... 3 ____
ENGL 102 or 108 ..... 3 ____
Or
ENGL 109H ..... 3 ____

**Second Language**
2nd semester proficiency by credit or exam required … _____

**Individuals and Societies (3 courses)**
Tier One ____ 150 A, B, or C ..... 3 ____
Tier One ____ 150 A, B, or C ..... 3 ____
Tier Two Individuals & Societies course ..... 3 ____

**Traditions and Cultures / Humanities (3 courses)**
Tier One ____160 A, B, C, or D ..... 3 ____
Tier One ____160 A, B, C, or D ..... 3 ____
Tier Two Humanities course ..... 3 ____

**Tier Two Arts (3 units total)**

_____ 3___

**Natural Sciences (NATS)**
Requirement satisfied by MCB major course work.

**Diversity Emphasis Course**
**(Gender/Race/Class/Ethnicity/Sexual Orient./Non-Western)**
*One undergraduate course must be taken from the GRCESONW list; certain Tier One and Tier Two courses can also be used to meet this requirement …*_____ ___

### MCB FOUNDATION COURSES

**Chemistry (General & Organic Chemistry, with labs)**
CHEM 141/143 ***OR*** 151 ***OR*** 161/163.....4 ___
CHEM 142/144 ***OR*** 152 ***OR*** 162/164.....4 ___
**CHEM 241A & 243A (F, S, SS)*.....3 ___ 1 ___**
**CHEM 241B & 243B (F, S, SS)* .....3 ___ 1 ___**
*** Calculated into major GPA**

**Mathematics (Calculus I, & Calculus II)**
MATH 122A/B OR *125* (F, S, SS) ..... 3-5 ___
MATH 129 (F, S, SS)..... 3 ___

**Physics (Introductory Physics)**
PHYS 102/181 ***OR*** 141 ***OR*** 161H (F, S, SS) ….3__ 1__ or 4___
PHYS 103/182 ***OR*** 241 ***OR*** 261H (F, S, SS) ….3__ 1__ or 4___

### MCB MAJOR (39 Unit Minimum)

**Core Requirements (21 units)**
MCB 195 or 295 – MCB Colloquia (F, S)..... 1 ____
MCB 181R - Introductory Biology I (F, S) ..... 3 ____
MCB 181L - Introductory Biology I Lab (F, S) ..... 1 ____
ECOL 182R - Introductory Biology II (F, S)..... 3 ____
ECOL 182L - Introductory Biology II Lab (F, S) ..... 1 ____
MCB 301 - Molecular Basis of Life (S)*..... 4 ____
MCB 304 - Molecular Genetics (F)*..... 4 ____
MCB 305 - Cell & Developmental Biology (S)* ..... 4 ____
*MCB 301, MCB 304, and MCB 305 must be taken in sequence.

## Systems and Big Data Biology Sub-Plan

**Upper Division Elective Courses (18 unit minimum):**

**Required Courses (9 units):**
MCB 315 Quantitative Biology (F, even years).....3 _____
MCB 480 Introduction to Systems Biology (S).....3 _____
MCB 447 Big Data in Biology and Biomedicine (F, odd years)...3 _____

**Choose one Lab/Research/Internship Requirement (3 units):**
MCB 392/492 Directed Research (F, S, SS) .....3 ___
MCB 399/499 Independent Study (F, S, SS) .....3 ___
MCB 399H/499H Honors Independent Study (F, S, SS) .....3 ___
MCB 498 Senior Capstone (F, S) .....3 ___
MCB 498H Honors Thesis (F, S) .....3 ___
MCB 493 Internship Experience (F, S, SS) .....3 ___
MCB 416A Statistical Bioinfo. & Genomic Analysis (S, even yr.).. 3 ___

**Choose additional required elective courses (6 units):**
*Choose upper division electives to meet requirement - see back of checklist for elective options.*
***Writing Emphasis Elective*** _____ 3 ____
***Upper Division MCB Elective:*** _____ *3* ____

### SUPPORTING COURSEWORK REQUIRED FOR SUB-PLAN

MATH 223 Vector Calculus (F, S, SS) ..... 3 ___
MATH 254 **or** 355 Differential Equations (F, S) ..... .....3 ___
MATH 313 Linear Algebra (F, S, SS)..... .....3 ___
MATH 363 Introduction to Statistics (F, S, SS) ..... ....3 ___
CSC 250 Essential Computing for the Sciences (S) ..... 3 ___

### UNIVERSITY REQUIREMENTS:

**120 total units ☐ 42 upper division units ☐**
**2.000+ cum GPA ☐ 2.000+ major GPA ☐**

MCWA complete___ Final 18 of 30 units complete____
30+ total units at UA___ 18+ MCB units at UA ___
<60 correspondence/UA exam units____

# Systems and Big Data Biology Sub-Plan Upper Division Elective Courses:

*Choose one Writing Emphasis Elective (3 unit min.):*
MCB 404 Bioethics – 3 units (F, S, SS)
MCB 413 Why is the Grass Green- Communicating with the Public – 3 units (F)
MCB 422 Problem Solving with Genetic Tools – 3 units (F, SS)
MCB 473 Recombinant DNA Methods and Applications – 3 units (S)
MCB 498 Senior Capstone – 3 units (F, S)
MCB 498H Senior Honors Thesis – 3 units (F, S)
ECOL 379 Evidence Based Medicine – 3 units (S)

*Choose one MCB Elective (3 unit min.):*
MCB 325 Biology of Cancer – 3 units (F)
MCB 422 Problem Solving with Genetic Tools – 3 units (F, SS)
MCB 425 Cancer Discoveries – 3 units (S)
MCB 442 Sex, Crime and Disease – Human Genetics today – 3 units (S)
MCB 482 Modeling Human Disease – 3 units (S)

** cannot be used to fulfill two sub-plan requirements*

*Course offerings are subject to change. Please consult the Schedule of Classes for specific semester course information.*