

# BACHELOR OF SCIENCE DEGREE IN MOLECULAR AND CELLULAR BIOLOGY

## Systems and Big Data Biology Sub-Plan

NAME \_\_\_\_\_

SID # \_\_\_\_\_

CATALOG YEAR 2020-2021 EXPECTED GRADUATION DATE \_\_\_\_\_

### GENERAL EDUCATION REQUIREMENTS

#### English Composition

ENGL 101 or 107 ..... 3 \_\_\_\_\_  
 ENGL 102 or 108 ..... 3 \_\_\_\_\_

Or

ENGL 109H ..... 3 \_\_\_\_\_

#### Second Language

2<sup>nd</sup> 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.*