

# BACHELOR OF SCIENCE DEGREE IN MOLECULAR AND CELLULAR BIOLOGY

## Molecular and Cellular 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

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 or Biostatistics)

MATH 122A/B OR 125 OR MATH 119A\* (F, S, SS) ..... 3-5 \_\_\_\_  
 MATH 129 OR MATH 263 (F, S, SS) ..... 3 \_\_\_\_  
 \* MATH 119A is not a pre-requisite for MATH 129

#### 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.

#### Molecular and Cellular Biology Sub-Plan

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

#### Choose three of the following courses (9 units):

MCB 325 Biology of Cancer (F) ..... 3 \_\_\_\_  
 MCB 422 Problem Solving with Genetic Tools (F, SS) ..... 3 \_\_\_\_  
 MCB 425 Cancer Discoveries (S) ..... 3 \_\_\_\_  
 MCB 480 Introduction to Systems Biology (F) ..... 3 \_\_\_\_  
 MCB 482 Modeling Human Disease (S) ..... 3 \_\_\_\_  
 MCB 442 Human Genetics: Sex, Crime and Disease (S) ..... 3 \_\_\_\_  
 MCB 447 Big Data in Biology and Medicine (F) ..... 3 \_\_\_\_  
 BIOC 385 Metabolic Biochemistry\*\* (F, S, SS) ..... 3 \_\_\_\_  
 \*\*The combo of BIOC 462A and BIOC 462B for BIOC 385 is an approved option.

#### Choose one Lab/Research/Internship Requirements (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 422 Problem Solving with Genetic Tools (F, SS) ..... 3 \_\_\_\_  
 MCB 473 Recombinant DNA (S) ..... 3 \_\_\_\_  
 MCB 493 Internship Experience (F, S, SS) ..... 3 \_\_\_\_  
 MCB 498 Senior Capstone (F, S) ..... 3 \_\_\_\_  
 MCB 498H Honors Thesis (F, S) ..... 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 \_\_\_\_

#### 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 \_\_\_\_\_

## Molecular and Cellular Biology Sub-Plan Upper Division Elective Courses:

### Choose one Writing Emphasis Elective (3 unit min.):

- MCB 404 Bioethics (Recommended) – 3 units (F, S, SS)
- MCB 413 Why is the Grass Green – Communicating Science to the Public – 3 units (F)
- MCB 422 Problem Solving w/ Genetic Tools – 3 units (F, SS)\*
- 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 315 Quantitative Biology – 3 units (F, even years only)
- MCB 325 Biology of Cancer – 3 units (F)\*
- MCB 396i Career Explorations & Professional – 2 units (F)
- MCB 397A Biology Outreach Development– 1 unit (F)
- MCB 397C STEM Outreach and Recruitment – 1 unit (S)
- MCB 416A Bioinformatics and Functional Genomic Analysis – 3 units (S, even years only)
- MCB 413 Why is the Grass Green – Communicating Science to the Public – 3 units (F)
- MCB 422 Problem Solving w/ Genetic Tools – 3 units (F, SS)\*
- MCB 425 Cancer Discoveries – 3 units (S)\*
- MCB 442 Human Genetics: Sex, Crime, and Disease – 3 units (S)\*
- MCB 445 Astrobiology and the Molecular History of Life on Earth – 3 units (S)\*
- MCB 447 Big Data in Molecular Biology and Medicine – 3 units (F, odd years only)\*
- MCB 473 Recombinant DNA Methods & Applications – 4 units (S)
- MCB 480 Introduction to Systems Biology – 3 units (F)\*
- MCB 482 Modeling Human Disease – 3 units (S)\*
- MCB 391 Lab Preceptorship – 3 units (F, S)
- MCB 491 Lab Preceptorship – 3 units (F, S)
- MCB 497A Special Tutoring Workshop – 1-5 units (F, S, SS)
- BIOC 384 Foundations in Biochemistry – 3 units (F, S, SS)
- BIOC 462A Biochemistry – 4 units (F)
- ECOL 326 Genomics – 3 units (F, SS)
- ECOL 346 Bioinformatics – 3 units (S)
- MIC 403R Biology of Animal Parasites – 3 units (F)
- MIC 420 Pathogenic Bacteriology – 3 units (F)
- MIC 433 Medical and Molecular Virology – 3 units (S)
- MIC 452 Antibiotics: A Biological Perspective – 3 units (F)
- NROS 430 Neurogenetics – 3 units (S)
- NSCS 440 How to Build a Brain: Mechanisms of Neural Development – 3 units (S)
- PLS 340 Introduction to Biotechnology – 3 units (F)
- PLS 360 Principles of Plant Physiology – 3 units (S)
- PLS 428R Microbial Genetics – 3 units (S)
- PSIO 467 Endocrine Physiology – 3 units (F)
- PSIO 484 Cardiovascular Muscle Biology and 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.*