

Elective Course “clusters” in focus areas

If you would like to (1) use some of your elective units to acquire more depth in a particular area related to your major (or one of the other MCB majors) (2) focus your restricted elective units in a particular field or (3) take some coursework that would help you achieve your career goals, please see the suggestions below. In many cases, classes in clusters listed outside your major will also satisfy your restricted electives, so be sure to browse all lists. You may also select other restricted electives that are not part of any of these clusters...these are just some suggestions if you would like some ideas. Please see your staff or master adviser if you have questions. Note that some of these courses may have prerequisites that are not part of your major curriculum.

General areas relevant for all MCB majors

Minor in Technology Management (offered by Graduate School of Management)

<http://www.gsm.ucdavis.edu/ProspectiveStudents/index.aspx?id=766&m2=67&m3=4&m1=6>

Minor in Quantitative Biology and Bioinformatics

<http://biosci.ucdavis.edu/undergrad/minors/qbb/courses.html>

Science Writing (as a career or as a valuable skill for any career that you might choose)

NEM 150 Revising Scientific Prose (4 units)

UWP 102B Writing in the Disciplines: Biology (4)

UWP 104A Writing in the Professions: Business reports and Technical communications (4)

UWP 104E Writing in the Professions: Science (4)

UWP 104F Writing in the Professions: Health (4)

BIT 188 Undergraduate Research Proposal (3)

STS 164 Writing Science (4)

Forensics

CHE 104 Forensic Applications of Analytical Chemistry (3 units)

ETX 102B Quantitative Analysis of Environmental Toxicants (5)

ENT 158 Forensic Entomology (3)

EMS 182 Failure Analysis (4)

FBS 161 Structure and Properties of Fibers (3)

FBS 161L Textile Chemical Analysis Lab (1)

MCB 162 Human Genetics (3)

MCB 120L Biochemistry Lab (6)

Health Professions (See Pre-Health Advising Services also)

<http://advisingservices.ucdavis.edu/advising/hsa/>

IDI 141 Infectious Diseases of Humans (1 unit)

MMI 188 Human Immunology (3)
CHA101/101L Human Gross Anatomy (4,3)
NPB 101/101L Systemic Physiology (5,3)
PMI 126/126L Fundamentals of Immunology/Immunology lab (3,2)
PMI 127 Medical Bacteria and Fungi (5)
PMI 128 Biology of Animal Viruses (3)
MIC 101 Introductory Microbiology (5)
MIC 102/102L General Microbiology (4,3)
CHE 130A/130B Pharmaceutical Chemistry (3,3)
Health-related/clinical internship (<http://iccweb.ucdavis.edu/>)

Teaching

MAST program internships (Math and Science Teaching program)
<http://mast.ucdavis.edu/>
http://mast.ucdavis.edu/K12InternshipOpportunitiesF08_2.pdf
BIS 195A/B Science Teaching Internship program (4, 1-5 units)
EDU 81 Learning in Science and Mathematics (2)
EDU 100 Introduction to Schools (4)
EDU 181 Teaching in Science and Math (2)

Marine Biology (Spring quarter in residence at Bodega Marine Lab)

<http://www-bml.ucdavis.edu/student-info/springcourses.html>
BIS 120/120P Developmental Biology of Marine Invertebrates/Lab (4,6 units)
BIS 122/122P Population Biology and ecology/Lab (3, 5)
BIS 123 Undergraduate Colloquium in Marine science (1)
BIS 124 Coastal Marine Research (3)

Career in Academic or Biotech Research, Graduate school

<http://advisingservices.ucdavis.edu/advising/grad/>
and see list of pre-graduate faculty advisers on MCB advising site
Course(s) to improve writing skills (see list above)
Internship (192) in a Biotech company (<http://iccweb.ucdavis.edu/>)
or Independent Research experience (193,199) in a faculty lab (see link to Undergraduate Research Opportunities)
MCB 194H Honors thesis (3)
Undergraduate seminar courses where you discuss current literature and analyze papers

History, Philosophy of Science/ Bioethics (many of these satisfy GE requirements)

PHI 5 Critical reasoning (4 units) GE: Wrt
PHI 15 Bioethics (4) GE: ArtHum, Wrt
PHI 30 Introduction to Philosophy of Science (4) GE: ArtHum, SciEng, Wrt
PHI 38 Introduction to Philosophy of Biology (4) GE: ArtHum, Wrt
PHI 108 Philosophy of the Biological Sciences (4) GE: ArtHum, SciEng, Wrt
STS 140 Genetics and Societal Issues (4) GE credit: SocSci, Wrt
STS 130B History of Modern Biology (4) GE credit: ArtHum, SciEng, Wrt

STS 131 Darwin (4) GE credit: ArtHum, SciEng, Wrt
STS 150 Gender and Science (4) GE credit: SocSci, Div, Wrt
BIT 171 Professionalism and Ethics in Genomics and Biotechnology (3)

Cell biology clusters (Note: check major for courses that fulfill restricted elective units)

Cellular Biophysics and Mathematical Modeling

(see also Quantitative Biology and Bioinformatics minor above)

BIS 20Q Modeling in Biology (2 units)
MCB 124 Macromolecular Structure and Function (4)
MCB 143 Cell Biophysics (3)
NPB 105 Introduction to Computer Models (4)
NPB 163 Information Processing Models in Neuroscience and Psychology (4)
BIM 102 Quantitative Cell Biology (4)
BIM 117 Analysis of Molecular and Cellular Networks (4)
BIS 132 Introduction to Dynamic Models in Modern Biology (4)
MAT 124 Mathematical Biology (4)

Development and Evolution

MCB 150/150L Developmental Biology/Lab (4,1 units)
MCB 164/163 Advanced Eukaryotic Genetics/Developmental Genetics (3,3)
EVE 100 Introduction to Evolution (4)
EVE 150 Evolution of Animal Development (3)
NPB 161 Developmental Neurobiology
PLB 112 Plant Growth and Development (3)

Plant Cell Biology

MCB 126 Plant Biochemistry (3 units)
PLB 113/113D Molecular and Cellular Biology of Plants (3)
PLB 111 Plant Physiology (3)
PLB 112 Plant Growth and Development (3)

Cell Biology of Health and Disease

MCB 144 Mechanisms of Cell Division
MCB 145 Assembly and Function of Cell Signaling Machinery (3)
IDI 141 Infectious Diseases of Humans (1)
MMI 188 Human Immunology (3)
NPB 103 Cellular Physiology/Neurobiology (3)
PMI 126/126L Fundamentals of Immunology (3,2)
PMI 127 Medical Bacteria and Fungi (5)
PMI 128 Biology of Animal Viruses (3)
MIC 162 General Virology (4)
ETX 104/NUT 104 Environmental and Nutritional factors in Cellular regulation and Nutritional Toxicants (4)

Biochemical Basis of Cellular Function

MCB 123 Behavior and Analysis of Enzyme and Receptor Systems (3)

MCB 124 Macromolecular Structure and Function (4)

MCB 126 Plant Biochemistry (3)

ETX 104/NUT 104 Environmental and Nutritional factors in Cellular regulation and Nutritional Toxicants (4)

Genetics clusters

Quantitative and Evolutionary Genetics

EVE 100 Introduction to Evolution (4)

EVE 102 Population and Quantitative Genetics (4 units; may be taught only in alternate years)

EVE 103 Phylogeny and Macroevolution (4)

EVE 150 Evolution of Animal Development (3)

ANG 107 Genetics and Animal Breeding (5)

ANG 120 Introduction to Statistical Genomics (3)

GEL 107/107L Earth History: Paleobiology (3,2)

GEL 141/141L Evolutionary History of Vertebrates (3,1)

GEL 152 Paleobiology of Protista (4)

Microbial Genetics

MIC 150 Bacterial Genetics (3 units)

MIC 155L Bacterial Physiology Lab (4)

MIC 170 Yeast Molecular Genetics (3)

Agricultural Genetics

PLS154 Introduction to Plant Breeding (4 units)

PLB 113 Molecular and Cellular Biology of Plants (3)

MCB 126/PLB 126 Plant Biochemistry (3)

PLB 143 Evolution of Crop Plants (4)

ANG 107 Genetics and Animal Breeding

BIT 160 Principles of Plant Biotechnology(3)

BIT 161A/B Genetics/Plant Genetics and Biotechnology Lab (6,6)

Bioinformatics and Genomics

(see also Quantitative Biology and Bioinformatics minor above)

MCB 182 Genomics (3 units)

ANG 120 Introduction to Statistical Genomics

ECS 124 Theory and Practice of Bioinformatics

BIT 150 Applied Bioinformatics (4)

BIT 171 Professionalism and Ethics in Genomics and Biotechnology (3)

Human Genetics/Genetic counseling

MCB 162 Human Genetics (3 units)
ANT 152 Human Evolution (5)
ANT 153 Human Biological Variation (5)
NPB 132 Nature vs. Nurture: Physiological Interactions Among Genes, Nutrients and Health (3)
EPP 101 Perspectives in Community Health (3)
EPP 160 General Health Education and Prevention (1-5)
EPP 162 Health advocates Peer Educator Training (4)
BIT 171 Professionalism and Ethics in Genomics and Biotechnology (3)

Developmental Genetics

MCB 163 Developmental Genetics
MCB 150/150L Developmental Biology
EVE 150 Evolution of Animal Development
PLB 112 Plant Growth and Development

Molecular Genetics

MCB 182 Genomics (3 units)
MIC 170 Yeast Molecular Genetics (3)
MIC 150 Bacterial Genetics (3)
MIC 115 Recombinant DNA Cloning and Analysis (3)

Biochemical Basis of Cellular Function

MCB 123 Behavior and Analysis of Enzyme and Receptor Systems (3)
MCB 124 Macromolecular Structure and Function (4)
MCB 126 Plant biochemistry (3)
ETX 104/NUT 104 Environmental and Nutritional factors in Cellular regulation and Nutritional Toxicants (4)

Biochemistry and Molecular Biology clusters

Biophysics

MCB 124 Macromolecular Structure and Function (4)
MCB 143 Cell Biophysics (3)
BIM 151 Mechanics of DNA (3)
BIM 162 Quantitative Concepts in Biomolecular Engineering (4)

Structural Biology and Molecular Analysis

MCB 124 Macromolecular Structure and Function (4)
EAD 172 Optical Methods for Biological Research (4)
CHE 115 Instrumental Analysis (4)
ETX 111 Introduction to Mass Spectrometry (3)

Pharmacology/ Drug Design

CHE 130A/B Pharmaceutical Chemistry (3,3)

CHE 150 Chemistry of Natural Products (3)

Quantitative Biology and Modeling

(see also Quantitative Biology and Bioinformatics minor above)

BIS 20Q Modeling in Biology (2)

MCB 143 Cell Biophysics (3)

BIS 132 Introduction to Dynamic Models in Modern Biology (4)

BIS 133 Collaborative Studies in Mathematical Biology (3)

MAT 124 Mathematical Biology

BIM 117 Analysis of Molecular and Cellular Networks (4)

Environmental biochemistry

ETX 101 Principles of Environmental toxicology (4)

ETX 103A Biological effects of toxicants (4)

ETX 104/NUT 104 Environmental and Nutritional factors in Cellular Regulation and Nutritional Toxicants (4)

Biotechnology

MCB 126 Plant Biochemistry (3)

ECH 160 Fundamentals of Biomanufacturing (3)

ECH 161A Biochemical Engineering Fundamentals (4)

BIM 140 Protein Engineering(4)

MIC 115 Recombinant DNA Cloning and Analysis (3)

VEN Fermentation Science (3)

Food and Nutritional Biochemistry

FST 100A Food Chemistry (4)

FST 102A Malting and Brewing Science (4)

FST 103 Physical and Chemical Methods for Food Analysis (4)

VEN 186 Fermentation Science (3)

ETX 104/NUT 104 Environmental and Nutritional factors in Cellular Regulation and Nutritional Toxicants (4)

ETX 128 Food Toxicology (3)