

MOLECULAR AND CELL BIOLOGY (MCB)

MCB 1200. Virus Hunters. (4 Credits)

Introduction to the biology of bacterial viruses (phages). Isolation from the environment and characterization of a novel phage for sequencing in MCB 1201. Data from this classroom-based research experience will be shared in a nationwide program fostering discovery-based undergraduate research. May be taken before or after MCB 1201 for students choosing both classes. CA 3-LAB.

Not open for credit to students who have passed MCB 1895 when taught as "Virus Hunting Laboratory."

Content Areas: CA3LAB: Science & Tech Lab

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%201200>)

MCB 1201. Virus Hunting: Applied Bioinformatics. (4 Credits)

Analysis of bacteriophages isolated in MCB 1200. Computational biology approaches including genome assembly, phylogenetic analysis and database searching to characterize gene content and evolutionary relationships. Focus on research methods and approaches, data interpretation, written and oral communication of scientific findings. Part of a two-semester series with MCB 1200, which can be taken in either order. CA 3-LAB.

Content Areas: CA3LAB: Science & Tech Lab

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%201201>)

MCB 1401. Honors Core: Computational Molecular Biology. (3 Credits)

(Also offered as BME 1401.) Introduction to research in computational biology through lectures, computer lab exercises, and mentored research projects. Topics include gene and genome structure, gene regulation, mechanisms of inheritance, biological databases, sequence alignment, motif finding, human genetics, forensic genetics, stem cell development, comparative genomics, early evolution, and modeling complex systems. CA 3.

Grading Basis: Honors Credit

Content Areas: CA3: Science & Technology

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%201401>)

MCB 1405. Honors Core: The Genetics Revolution in Contemporary Culture. (3 Credits)

Exploration of the use of genetics concepts in popular culture. Topics include genetic analysis, genetic engineering, cloning and DNA forensics as represented in media including news, film, literature and art.

Discussion includes influence on society, attitudes towards science, domestic and foreign policy as well as medical practice and law. CA 3. Open only to freshmen and sophomores in the Honors Program.

Grading Basis: Honors Credit

Content Areas: CA3: Science & Technology

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%201405>)

MCB 1893. Foreign Study. (1-6 Credits)

Special topics taken in an international study program.

May be repeated for a total of 6 credits

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%201893>)

MCB 1895. Special Topics in Molecular and Cell Biology. (1-4 Credits)

Credits and hours by arrangement.

Prerequisites and recommended preparation vary.

May be repeated for a total of 8 credits

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%201895>)

MCB 2000. Introduction to Biochemistry. (4 Credits)

The structure, chemistry, and metabolism of carbohydrates, lipids and proteins. Enzyme function and kinetics, energy metabolism, and structure and function of nucleic acids. A survey course for students of agriculture, general biology, medical technology, nursing, and pharmacy. Molecular and Cell Biology majors, biophysics majors, and other students desiring a more intensive introduction or considering advanced course work in biochemistry or molecular biology should take MCB 3010.

CHEM 2241 or 2444. CHEM 2444 may be taken concurrently. Not open for credit to students who have passed MCB 3010. Repeat restrictions apply. See advising.uconn.edu/repeat-policy for information.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%202000>)

MCB 2210. Cell Biology. (3 Credits)

Structural organization of cells and the molecular basis of dynamic cellular processes, with emphasis on eukaryotic cells. Topics include protein targeting, vesicle trafficking, cytoskeleton, cell-cell interactions in tissues, and the molecular basis of related human diseases. Intended to be taken before MCB 2000 or 3010.

BIOL 1107. Not open for credit to students who have passed MCB 2215.

May not be taken out of sequence after passing MCB 3211, 3220, 3246, or 3842W.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%202210>)

MCB 2215. Honors Cell Biology. (3 Credits)

Overview of eukaryotic cell biology for Honors students. Emphasizes primary research literature and in-class discussion.

BIOL 1107; open to Honors students, others with consent. Not open to students who have passed MCB 2210. May not be taken out of sequence after passing MCB 3211, 3220, 3246, or 3842W.

Grading Basis: Honors Credit

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%202215>)

MCB 2225. Cell Biology Laboratory. (4 Credits)

A laboratory experience that will prepare students for thesis research in the biological sciences. Experimental design, quantitative analysis and presentation of data. Topics include cell culture, fluorescence and time-lapse microscopy, DNA transfection, image processing, and flow cytometry. Students will also pursue independent research projects. BIOL 1107 or equivalent; open to honors students, non-honors students with instructor consent.

Grading Basis: Honors Credit

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%202225>)

MCB 2400. Human Genetics. (3 Credits)

Foundational principles of classical genetics and modern genomics with a specific focus on humans. Emphasis on case studies and applications to human genetic diseases.

BIOL 1107; not open to students who have passed MCB 2410. May not be taken out of sequence after passing MCB 3220, 3400, 3410, 3412, 3413, 3843W, or 4416.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%202400>)

MCB 2410. Genetics. (3 Credits)

Foundational principles of classical genetics and modern genomics with a focus on eukaryotic model genetic organisms. Emphasis on molecular mechanisms underlying heredity. Intended for majors in MCB and related disciplines.

BIOL 1107. Not open to students who have passed MCB 2400. May not be taken out of sequence after passing MCB 3220, 3400, 3410, 3412, 3413, 3843W, or 4416. Repeat restrictions apply; see [advising.uconn.edu/ repeat-policy](https://advising.uconn.edu/repeat-policy) for information.

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%202410](https://catalog.uconn.edu/course-search/?details&code=MCB%202410))

MCB 2610. Fundamentals of Microbiology. (4 Credits)

Biology of microorganisms, especially bacteria. Cellular structure, physiology, genetics, and interactions with higher forms of life. Laboratory familiarizes students with methodology of microbiology and aseptic techniques.

CHEM 2241 or 2443, which may be taken concurrently. Recommended preparation: BIOL 1107. May not be taken out of sequence after passing MCB 3246, 3617, 3633, 3635, 3636, 3637, 3640, or 4624. Repeat restrictions apply; see [advising.uconn.edu/ repeat-policy](https://advising.uconn.edu/repeat-policy) for information.

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%202610](https://catalog.uconn.edu/course-search/?details&code=MCB%202610))

MCB 2612. Honors Core: Microbe Hunters - Crowdsourcing Antibiotic Discovery. (4 Credits)

Concepts of microbiology taught through the lens of antibiotic resistance. Using environmental samples students actively engage in the hunt for novel antimicrobials. Broader concepts include the meaning of disease, how that meaning has changed over time and the implications of widespread antibiotic resistance for society. CA 3-LAB.

Grading Basis: Honors Credit

Content Areas: CA3LAB: Science & Tech Lab

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%202612](https://catalog.uconn.edu/course-search/?details&code=MCB%202612))

MCB 2893. Foreign Study. (1-5 Credits)

Special topics taken in an international study program. Consent of Associate Department Head for Undergraduate Research and Education required, normally to be granted before the student's departure.

May be repeated for credit

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%202893](https://catalog.uconn.edu/course-search/?details&code=MCB%202893))

MCB 3003. Biophysical Chemistry I. (3 Credits)

An introduction to the physical chemistry of biological molecules and systems. Principal topics include biomolecular thermodynamics, kinetics, transport properties, and biomolecular structure.

MATH 2110Q or 2130Q; PHYS 1402Q, 1502Q, or 1602Q, or instructor consent. Recommended preparation: MCB 2000 or 3010.

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%203003](https://catalog.uconn.edu/course-search/?details&code=MCB%203003))

MCB 3004. Biophysical Chemistry II. (3 Credits)

The physical chemistry of biological molecules and systems. Emphasis on a statistical framework for understanding biomolecular phenomena. Principal topics will include electrostatics, intermolecular forces, ligand binding, and protein stability and folding.

MATH 2110Q or 2130Q; PHYS 1402Q, 1502Q, or 1602Q, or instructor consent. Recommended preparation: MCB 2000 or 3010; MCB 3003 or CHEM 3563.

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%203004](https://catalog.uconn.edu/course-search/?details&code=MCB%203004))

MCB 3010. Biochemistry. (5 Credits)

The structure and function of biological macromolecules. The metabolism of carbohydrates, lipids, amino acids, proteins and nucleic acids. The regulation of metabolism and biosynthesis of biological macromolecules. An in-depth introduction intended for students planning to take advanced coursework in biochemistry, biophysics or other areas of molecular biology.

CHEM 2444, which may be taken concurrently. Recommended preparation MCB 2210 or 2610. Not open for credit to students who have passed MCB 2000. Repeat restrictions apply. Go to [http:// www.advising.uconn.edu/repeatpolicy.php](http://www.advising.uconn.edu/repeatpolicy.php) for more information.

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%203010](https://catalog.uconn.edu/course-search/?details&code=MCB%203010))

MCB 3011. Human Metabolism and Disease. (2 Credits)

A thorough analysis of the inter-relationships of metabolic pathways in connection with human health and disease, including inherited metabolic diseases and the role of hormones in metabolic pathways. MCB 2000 or 3010 or instructor consent.

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%203011](https://catalog.uconn.edu/course-search/?details&code=MCB%203011))

MCB 3022W. Human Disease and the Development of Therapeutic Agents. (3 Credits)

Molecular basis of human disease and strategies for developing therapeutic treatments. Applications of genetic, cellular, and biochemical information in treating disease states. Especially appropriate for students interested in biomedical research and the health profession.

ENGL 1007 or 1010 or 1011 or 2011. Recommended preparation: one 2000 level course in MCB.

Skill Codes: COMP: Writing Competency

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%203022W](https://catalog.uconn.edu/course-search/?details&code=MCB%203022W))

MCB 3100. Introduction to Translational Research. (3 Credits)

Basic science and design of human subject research; participation in clinical, patient-oriented research projects at CT Children's Medical Center emergency department in Hartford, CT.

Instructor consent required. Recommended preparation: MCB 2000, 2210, 2610 or 3010.

Grading Basis: Honors Credit

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%203100](https://catalog.uconn.edu/course-search/?details&code=MCB%203100))

MCB 3189. Clinical Research Laboratory. (3 Credits)

Participation in a clinical research study at a medical center (transportation to this off-campus site to be arranged by the student). MCB 3100.

May be repeated for credit

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%203189](https://catalog.uconn.edu/course-search/?details&code=MCB%203189))

MCB 3201. Gene Expression. (3 Credits)

Basic mechanisms of genetic information transfer in eukaryotic cells from DNA to folded and assembled proteins. Regulation of transcription, translation, DNA replication, and the cell cycle.

Recommended preparation: MCB 2000, 2210, 2400, 2410 or 3010.

View Classes ([https://catalog.uconn.edu/course-search/? details&code=MCB%203201](https://catalog.uconn.edu/course-search/?details&code=MCB%203201))

MCB 3211. Cancer Cell Biology and Genetics. (3 Credits)

Genetics and epigenetics of cancer cells. Cellular signaling and growth control. The role of oncogenes and tumor suppressor genes in regulating cancer cell proliferation and death. DNA damage and repair mechanisms. Carcinogen activation detoxification. General and targeted approaches to cancer therapy.

MCB 2210. Recommended preparation: MCB 2400 or 2410.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203211>)

MCB 3219. Developmental and Regenerative Biology. (3 Credits)

Fundamental principles that govern animal embryonic development and regeneration with emphasis on the cellular and molecular basis of pattern formation and cell differentiation in a variety of model organisms. Relevance to human development and disease and therapeutic applications will be discussed.

BIOL 1107. Recommended preparation: MCB 2210 and 2400 or 2410

which may be taken concurrently.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203219>)

MCB 3220. Developmental Biology Laboratory. (4 Credits)

Zebrafish used as an experimental model system to investigate molecular mechanisms of vertebrate development. Self-directed experiments utilize cellular, genetic, pharmacological and microscopic techniques to recreate established findings and pursue new knowledge.

MCB 2210 or 2215, and MCB 2400 or 2410. Recommended preparation: MCB 3219.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203220>)

MCB 3246. Virology. (3 Credits)

Biological, biochemical, physical, and genetic characteristics of viruses, with an emphasis on molecular and quantitative aspects of virus-cell interactions.

MCB 2610 and MCB 2210. Recommended preparation: MCB 3201 or 3010.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203246>)

MCB 3400. Human Evolutionary Genomics. (3 Credits)

Principles of evolutionary genomics and their applications in understanding recent human evolutionary history and the origin and distribution of genetic and phenotypic variation, including disease, within and among human populations.

MCB 2400 or 2410. Recommended preparation: EEB 2245.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203400>)

MCB 3410. Eukaryotic Genomics. (3 Credits)

Introduction to the study of eukaryotic genomes. Topics include genome sequence organization and analysis, comparative genomics, structural variants, transposable elements and genome regulation in human health and disease.

MCB 2400 or 2410; open to sophomores or higher.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203410>)

MCB 3412. Genetic Engineering and Functional Genomics. (3 Credits)

Methods and applications of genetic engineering, including gene manipulation and transfer techniques in prokaryotes and eukaryotes. Emphasis on applications of recombinant DNA technology in the elucidation of gene function. Consideration of recent technological developments in molecular genetics, such as cloning, gene therapy, the patenting and release of genetically engineered organisms, and societal issues related to these developments.

MCB 2400 or 2410. Recommended preparation: MCB 2000 or 3010.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203412>)

MCB 3413. Concepts of Genetic Analysis. (4 Credits)

Survey of genetic theory and applications of genetic analysis to model organisms including animals, plants, and microbes.

MCB 2400 or 2410. Not open for credit to students who have passed MCB 2413.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203413>)

MCB 3417. The Molecular Genetics of Inherited Human Disease. (2 Credits)

An overview of the genetic basis for inherited human disease and how changes in protein structure due to mutations produce disease phenotypes.

MCB 2400 or 2410. Recommended preparation: MCB 2000.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203417>)

MCB 3421. Introduction to Molecular Evolution and Bioinformatics. (3 Credits)

Evolution of biomolecules and application to molecular data analysis and the design of new molecules. Topics include prebiotic chemistry, origin of cells, selfish genes, molecular innovations, data bank searches, alignment of sequence and 3-D protein structures. Course includes lectures, discussions and computer lab exercises.

Recommended preparation: At least one 2000 level course in MCB.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203421>)

MCB 3602W. Introduction to Bioinformatic Tools for Microbial Genome Annotation. (1 Credit)

Analysis of microbial genome sequences using computational tools to examine metabolic pathways and genetic features as they relate to an organism's lifestyle. Writing assignments utilize information gathered from the relevant scientific literature and students' analyses of genome-derived information.

MCB 2000 or 2610 or 3010; ENGL 1007 or 1010 or 1011 or 2011.

Skill Codes: COMP. Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203602W>)

MCB 3617. Molecular Biology and Genetics of Prokaryotes. (4 Credits)

Molecular genetics of bacteria, archaeobacteria, and their viruses. Transcription and replication of DNA, transformation, transduction, conjugation, genetic mapping, mutagenesis, regulation of gene expression, genome organization.

MCB 2610.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203617>)

MCB 3620. Host-Associated Microbiomes. (3 Credits)

Current research on microbial communities associated with living hosts, with a focus on evolution, ecology, immunology and human health. MCB 2610 or 2612. Not open for credit to students who have passed MCB 3895 when taught as "Host-Associated Microbiomes." View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203620>)

MCB 3633. Pathogenic Microbiology. (4 Credits)

Descriptions of infectious diseases caused by bacteria, viruses, and protozoans in relation to the affected human organ systems and discussions of the underlying virulence factors, molecular mechanisms, and epidemiological data. Modern techniques are used in the laboratory to identify and characterize pathogenic bacteria.

MCB 2610.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203633>)

MCB 3637. Practical Methods in Microbial Genomics. (3 Credits)

Analysis of microbial genomes, including genome assembly, annotation, and comparison. Students will design and perform computational analyses of public domain genomic data. No previous computational experience is expected.

MCB 2610 or instructor consent.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203637>)

MCB 3841W. Research Literature in Molecular and Cell Biology. (3 Credits)

Discussion of current research in molecular and cell biology. ENGL 1007 or 1010 or 1011 or 2011. Recommended preparation: One 2000 level course in MCB. May be repeated for credit

Skill Codes: COMP. Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203841W>)

MCB 3842W. Current Investigations in Cancer Cell Biology. (3 Credits)

Mechanisms involved in cancer initiation, promotion, and progression: cancer genomes, epigenetic regulation of gene expression and reprogramming, cancer stem cells, alterations in cell signaling networks, cancer cell bioenergetics, environmental exposures and xenobiotic metabolism, development of resistance to therapeutics.

ENGL 1007 or 1010 or 1011 or 2011; MCB 2000 or 2210 or 3010.

Skill Codes: COMP. Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203842W>)

MCB 3843W. Research Literature in Comparative Genomics. (3 Credits)

Current research in comparative genomics, which uses cross-species analyses to identify functional genome sequences. Primary research literature concerning the complex and dynamic nature of eukaryotic genomes. Emphasis on communicating scientific findings using experimental data.

ENGL 1007 or 1010 or 1011 or 2011; MCB 2400 or 2410. Not open for credit to students who have passed MCB 3841W when taught as "Comparative Genomics."

Skill Codes: COMP. Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203843W>)

MCB 3844W. Microbiology and the Media. (3 Credits)

Analysis and comparison of how contemporary microbiological topics such as food-borne diseases and influenza outbreaks are represented in the scientific literature and in popular media.

ENGL 1007 or 1010 or 1011 or 2011; at least two MCB courses at the 2000 level or above; open only to Molecular and Cell Biology and Biological Sciences majors; others by permission.

Skill Codes: COMP. Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203844W>)

MCB 3845W. Microbial Diversity, Ecology and Evolution. (3 Credits)

Readings from the scientific literature will provide a focus for investigating the mechanisms and strategies for the exchange of genetic information, as well as the impact of gene transfer on environmental adaptation and evolution.

BIOL 1107; ENGL 1007 or 1010 or 1011 or 2011. Recommended preparation: MCB 2610.

Skill Codes: COMP. Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203845W>)

MCB 3847W. Historically Excluded and Underrepresented Scientists. (3 Credits)

The history and implication of the exclusion of people from various backgrounds in science. A focus on biological research and ways to improve scientific and academic environments to include people from diverse backgrounds.

MCB 2400 or 2410 and 2610; ENGL 1007 or 1010 or 1011 or 2011. Not open for credit to students who have passed MCB 3841W when offered as "Women and Historically Excluded and Underrepresented Scientists."

Skill Codes: COMP. Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203847W>)

MCB 3849W. Symbiosis: The Science of Living Together. (3 Credits)

All animals and plants enter into lifelong associations with beneficial microorganisms that have a profound impact on host development and health. Readings from the scientific literature will explore the molecular mechanisms by which these complex associations are established and maintained in various model systems.

MCB 2610 and ENGL 1007 or 1010 or 1011 or 2011. Recommended preparation: any additional 2000-level MCB course.

Skill Codes: COMP. Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203849W>)

MCB 3893. Foreign Study. (1-5 Credits)

Special topics taken in an international study program. Consent of instructor required, normally to be granted before the student's departure. Open to sophomores or higher.

May be repeated for credit

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203893>)

MCB 3895. Special Topics. (1-6 Credits)

Prerequisites and recommended preparation vary.

May be repeated for credit

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203895>)

MCB 3898. Variable Topics. (3 Credits)

Prerequisites and recommended preparation vary.

May be repeated for credit

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203898>)

MCB 3899. Independent Study. (1-6 Credits)

Designed for the advanced undergraduate student who is pursuing a special problem as an introduction to independent investigation.

May be repeated for credit

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%203899>)

MCB 4008. Techniques of Biophysical Chemistry. (3 Credits)

Theory and applications of biophysical methods for the analysis of the size, shape and interactions of proteins and nucleic acids. Topics include analytical ultracentrifugation, light scattering, X-ray scattering, calorimetry, surface plasmon resonance and single molecule approaches. MCB 3003 or CHEM 3563 or instructor consent.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204008>)

MCB 4009. Structure and Function of Biological Macromolecules. (3 Credits)

Fundamentals of protein structure and the forces that stabilize structure. Topics include recurrent structural motifs, molecular ancestry/homology, evolution of protein structure, structure-function correlations, and the structural basis of regulation. Discussion of the techniques used to investigate structure, including X-ray diffraction, NMR, TEM, AFM, structure prediction, and computational simulations. Advanced topics may include chaperones, structural genomics and the roles of misfolded proteins in disease.

MCB 2000 or 3010, which may be taken concurrently, or instructor consent.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204009>)

MCB 4014. Structure and Dynamics of Macromolecular Complexes. (3 Credits)

Biochemical and biophysical characteristics of macromolecular biological assemblies from atomic to the cellular level. Topics include ribosomes, viruses, polymerases, membrane protein assemblies and ion transporters, examined through lecture, discussion, primary literature and interactive computational modules.

MCB 2000 or 3010. Not open for credit to students who have passed MCB 3895 when offered as "Structure and Dynamics of Cellular Machines."

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204014>)

MCB 4026W. Advanced Biochemistry Laboratory. (4 Credits)

Theory and application of modern techniques for separation and characterization of biological macromolecules, including several types of liquid chromatography, liquid scintillation spectro-photometry, and SDS polyacrylamide gel electrophoresis. Instruction in writing a scientific paper.

MCB 3010, or MCB 2000 with consent of instructor; ENGL 1007 or 1010 or 1011 or 2011.

Skill Codes: COMP Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204026W>)

MCB 4211. Basic Immunology. (3 Credits)

An introduction to the genetic, biochemical, and cellular mechanisms of the immune system. This course will address basic aspects of immune function, and will examine abnormal immune function associated with cancer, autoimmune disease, AIDS, and other immunological abnormalities.

BIOL 1107. Recommended preparation: MCB 2210.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204211>)

MCB 4215. Fundamentals of Light Microscopy and Digital Imaging. (3 Credits)

The principles behind a wide range of microscopy techniques, including epifluorescence, confocal, Total Internal Reflectance Microscopy (TIRFM), and super-resolution and expansion microscopy.

MCB 2210 or 2215. Recommended preparation: MCB 2225; experience with fluorescence microscopy gained through independent study in a biological sciences laboratory. Not open for credit to students who have passed MCB 3895 when offered as "Fundamentals of Light Microscopy and Digital Imaging."

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204215>)

MCB 4416. Forensic Application of DNA Science. (3 Credits)

DNA analysis in forensic science, with emphasis on molecular genetic technology in criminal investigations and issues surrounding the use of DNA evidence. Team-taught with forensic practitioners.

MCB 2400 or 2410.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204416>)

MCB 4601. Physiology of Archaea and Bacteria. (3 Credits)

Examination of biochemical energy generation, regulation of metabolism, and cellular structures of archaea and bacteria. Physiological processes as they occur in nature and the biotechnology industry.

MCB 2000, 2610, or 3010. Not open for credit to students who have passed MCB 3601.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204601>)

MCB 4624. Experiments in Bacterial Genetics. (3 Credits)

Experiments in bacterial genetics, emphasizing genetic manipulations and analyses using modern biological techniques including transposon mutagenesis, DNA isolation, PCR, DNA sequencing and phenotypic analysis.

MCB 2610. Recommended preparation: MCB 3617.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204624>)

MCB 4893. Foreign Study. (1-5 Credits)

Special topics taken in an international study program. Consent of program director required, normally to be granted before the student's departure.

Open to sophomores or higher.

May be repeated for credit

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204893>)

MCB 4894. Undergraduate Seminar. (1-6 Credits)

Credits and hours by arrangement.

May be repeated for credit

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204894>)

MCB 4896. Undergraduate Research. (1-6 Credits)

Laboratory research project carried on by the student under the guidance of a faculty member. The student is required to submit a brief report on the research findings at the end of the semester.

May be repeated for credit

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204896>)

MCB 4897W. Senior Research Thesis. (3 Credits)

Writing of a thesis based upon the student's independent laboratory research project. Formerly offered as MCB 3996W.

Three credits of MCB 3989 or 4989, which may be taken concurrently; ENGL 1007 or 1010 or 1011 or 2011.

Skill Codes: COMP. Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204897W>)

MCB 4996. Honors Undergraduate Research. (1-6 Credits)

Laboratory research project carried on by the student under the guidance of a faculty member. The student is required to submit a brief report on the research findings at the end of the semester.

Open only to honors students with consent of instructor.

May be repeated for credit

Grading Basis: Honors Credit

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204996>)

MCB 4997W. Senior Honors Research Thesis. (3 Credits)

Writing of a thesis based upon a student's independent laboratory research project.

Three credits of MCB 3989 or 4989, which may be taken concurrently; ENGL 1007 or 1010 or 1011 or 2011; open only to honors students.

Grading Basis: Honors Credit

Skill Codes: COMP. Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=MCB%204997W>)