

BIOLOGY - MICROBIOLOGY (BIOM)

BIOM 250N - Microbiology for Health Sciences. 3 Credits.

Offered spring and summer. Infectious diseases, including concepts of virulence, resistance, prevention and control of microbial diseases in the individual and in the community. If laboratory experience is desired, the student may enroll concurrently in BIOM 251. Credit not allowed toward a major in microbiology.

Gen Ed Attributes: Natural Science

BIOM 251 - Microbiology Health Sciences Lab. 1 Credit.

Offered spring. Prereq. or coreq., BIOM 250N. Observation of live microorganisms, their characteristics and activities. Experience with microbiological techniques. Credit not allowed toward a major in microbiology.

BIOM 291 - Special Topics. 1-6 Credits.

(R-6) Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

BIOM 327 - Vector-Borne Diseases: Public Health Perspectives. 3 Credits.

Offered autumn. Prereq., upper-division standing or consent of instructor. An exploration of major vector-borne diseases including Lyme disease, malaria, dengue fever, yellow fever, Zika, etc. Lectures will cover disease history, biology and transmission dynamics, geographic and demographic trends, intervention strategies, and relationships to climate change. Students will be encouraged to bring perspectives from any major field of study to discussions of the public health challenges of vector-borne diseases in the 21st century.

BIOM 360 - General Microbiology. 3 Credits.

Offered autumn and summer. Prereq., CHMY 123 or 143N; Prereq. or coreq., BIOB 260. Microbial structure and function, growth and reproduction, physiology, ecology, genetics, environmental factors, control of microorganisms and sterility, antimicrobial agents, microbial diversity.

BIOM 361 - General Microbiology Lab. 2 Credits.

Offered autumn. Prereq. or coreq., BIOM 360. Basic microbiology procedures and techniques.

BIOM 390 - Undergraduate Research. 1-6 Credits.

(R-10) Offered every term. Prereq., consent of instr. Independent research under the direction of a faculty member. Graded credit/no credit.

BIOM 402 - Pathogenic Microbes. 3 Credits.

Offered spring. Prereq., BIOM 360. A study of the pathogenic bacteria and fungi and the diseases they produce. Level: Undergraduate-Graduate

BIOM 403 - Pathogenic Microbes Laboratory. 2 Credits.

Offered spring. Prereq., BIOM 361; Prereq. or coreq., BIOM 402. Laboratory study of pathogenic bacteria and fungi. Level: Undergraduate-Graduate

BIOM 407 - Clinical Diagnosis. 2 Credits.

Offered spring. Prereq., BIOM 360-361 or BIOH 365/366 or BIOM 402/403 (may concur). Principles of blood chemistry, urinalysis, blood banking, serology and other clinical parameters of disease and health. Level: Undergraduate-Graduate

BIOM 408 - Clinical Diagnosis Lab. 1 Credit.

Offered spring. Prereq., or coreq., BIOM 407. Clinical diagnostic methods. Level: Undergraduate-Graduate

BIOM 410 - Microbial Genetics. 3 Credits.

Offered spring even-numbered years. Prereq., BIOM 360 and 361. The molecular genetics of prokaryotic organisms including: structure and replication of the prokaryotic chromosome; gene expression; mutagenesis and DNA repair; plasmids and other tools of genetic engineering; transmission of genetic material and recombination in prokaryotes; regulation of gene expression in prokaryotes; recombinant DNA and biotechnology. Level: Undergraduate-Graduate

BIOM 411 - Experimental Microbial Genetics Lab. 1 Credit.

Offered spring even-numbered years. Prereq. or coreq., BIOM 410. Experiments in microbial genetics: Analysis of genes and genomes. Level: Undergraduate-Graduate

BIOM 415 - Microbial Diversity Ecology & Evolution. 3 Credits.

Offered spring. Prereq., BIOB 260, recommended prereq., or coreq., BIOB 272, BIOM 360. A broad overview of the physiological, phylogenetic and genomic diversity and ecology of microorganisms within a framework of general ecological principles. Focuses on microbial interactions with their environment at the level of the individual, population and community, including intimate associations with plants and animals. Surveys current methods for studying microbial ecology and diversity in the environment. Level: Undergraduate-Graduate

BIOM 420 - Host-Microbe Interactions. 3 Credits.

Offered intermittently. Prereq., BIOB 260 and BIOB 272. Many organisms on the planet are hosts that interact with a diversity of microbes. Understanding these interactions is crucial to explain patterns of biodiversity and to improve the quality of human life. This course explores the diversity of host-microbe interactions in nature using the primary scientific literature as our guide. Level: Undergraduate
Gen Ed Attributes: Writing in the Disciplines

BIOM 427 - General Parasitology. 2 Credits.

Offered autumn. Prereq., BIOB 272. Parasitism as a biological phenomenon, origin of parasitism, adaptations and life cycles, parasite morphology, fine structure, physiology, parasites and their environment. Level: Undergraduate-Graduate

BIOM 428 - General Parasitology Lab. 2 Credits.

Offered autumn. Coreq., BIOM 427. Taxonomy, morphology and identification of parasitic protozoa, helminths and arthropods. Level: Undergraduate-Graduate

BIOM 435 - Virology. 3 Credits.

Offered spring. Prereq., BIOB 260. The general nature of viruses, with emphasis on the molecular biology of animal and human viruses. Co-convenes with BIOM 535. Level: Undergraduate

BIOM 450 - Microbial Physiology. 3 Credits.

Offered autumn, odd-numbered years. Prereq., BIOM 360. Microbial structure and function, physiological diversity, microbial metabolism, role of microbial activity in the environment. Level: Undergraduate-Graduate

BIOM 451 - Microbial Physiology Lab. 1 Credit.

Offered autumn, odd-numbered years. Prereq., BIOM 361. Prereq. or coreq., BIOM 450. Experimental approaches to analysis of microbial structure, composition and metabolism. Level: Undergraduate-Graduate

BIOM 460 - Ecology of Infectious Diseases. 3 Credits.

Offered spring. In this course, we will take an ecological approach to understand infectious diseases. We will examine how diseases spread through time and space, and examine mathematical models of disease spread and their usefulness in control strategies. We will discuss case studies of both human and animal diseases, and the ecological concepts that apply to a wide range of systems. Level: Undergraduate-Graduate

BIOM 490 - Advanced Undergraduate Research. 1-10 Credits.

(R-10) Offered every term. Prereq., BIOM 360, junior or senior standing and consent of instr. Independent research under the direction of a faculty member. Graded credit/no credit. Level: Undergraduate

BIOM 491 - Special Topics. 1-10 Credits.

(R-10) Offered intermittently. Experimental offerings of new courses, experimental offerings of visiting professors, or one-time offerings of current topics. Level: Undergraduate-Graduate

BIOM 494 - Seminar. 1 Credit.

(R-3) Offered intermittently. Prereq., senior standing in natural sciences. Recent topics in microbiology and related subjects. Level: Undergraduate

BIOM 498 - Internship. 1-6 Credits.

(R-6) Offered every term. Prereq., consent of instr. Extended classroom experience which provides practical application of classroom learning during placements off campus. Level: Undergraduate

BIOM 499 - Undergraduate Thesis. 3-6 Credits.

(R-6) Offered every term. Prereq., senior standing and consent of instr. Preparation of a thesis or manuscript based on undergraduate research for presentation and/or publication. Student must give an oral or poster presentation at the Biological Sciences Undergraduate Research Symposium or a scientific meeting. Level: Undergraduate

BIOM 502 - Advanced Immunology. 3 Credits.

Offered autumn even-numbered years. Advanced topics and immunological techniques used in modern immunology. Level: Graduate

BIOM 535 - Advanced Virology. 3 Credits.

Coreq., BIOB 592. A "principles-based" discussion of virology, focusing on the molecular processes and events that must be completed by all viruses for successful replication within an individual host, and spread through host populations. The molecular basis of alternative replication strategies, the interactions of viruses with hosts organisms, and how these interactions lead to disease will be presented with examples drawn from a representative set of more well-understood animal viruses. BIOM 535 emphasizes independent, creative, critical thought. Co-convenes with BIOM 435. Level: Graduate

BIOM 540 - Microbial Pathogenesis. 3 Credits.

Offered fall. Prereq., graduate standing. Current concepts in pathogenesis at the molecular and cellular levels. Focus is on microbial (viral, bacterial) and genetic factors leading to disease and the host's involvement in the process. Level: Graduate

BIOM 546 - Experimental Microbial Ecology. 1 Credit.

Offered every term. Prereq., graduate standing or consent of instr. Focus on experimental design, methods, and presentation of experimental results in the area of microbial ecology. Level: Graduate

BIOM 570 - Intro to Research. 1 Credit.

(R-2) Offered autumn and spring. Prereq., graduate standing. Required course for biochemistry and microbiology graduate students. Instruction in basic research techniques, research equipment and reading in the relevant scientific literature. Students conduct research projects under faculty mentors of their choosing. Level: Graduate

BIOM 590 - Research. 1-18 Credits.

(R-30) Offered intermittently. Directed individual research and study appropriate to the background and objectives of the student. Level: Graduate

BIOM 591 - Special Topics. 1-6 Credits.

(R-24) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Level: Graduate

BIOM 592 - Independent Study. 1-6 Credits.

(R-6) Requires consent of instructor. Course material appropriate to the needs and objectives of the individual student. Level: Graduate

BIOM 594 - Molecular and Biomedical Sciences Seminar. 1 Credit.

(R-14) Prereq., graduate standing or consent of instr. Same as BCH 594. Presentation of current research in biochemistry and molecular biology by senior graduate students, faculty, and invited outside speakers. Level: Graduate

BIOM 599 - Thesis. 1-10 Credits.

(R-10) Offered intermittently. Prereq., master's student in microbiology. Laboratory research for and preparation of a master's thesis. Level: Graduate

BIOM 699 - Dissertation. 1-20 Credits.

(R-20) Offered intermittently. Prereq., doctoral student in microbiology. Laboratory research for and preparation of a doctoral dissertation. Level: Graduate