

# BIOLOGY-MICROBIOLOGY (BIOM)

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## **BIOM 135N - Hot Spring Micb: Yellowstone. 3 Credits.**

Offered intermittently. A field and laboratory based exploration of the microbial diversity of the thermal features of our first national park. Topics to be discussed include how these communities are shaped by the physical and chemical conditions of the environment and how microorganisms can thrive at life's extremes. Includes a field trip to Yellowstone National Park.

Gen Ed Attributes: Natural Science Course (N)

## **BIOM 227 - Vectors and Parasites. 3 Credits.**

Offered spring. Prereq., college level general biology class is recommended but not required. An introduction to the major groups of parasites and arthropod-borne pathogens infecting humans worldwide. The class will stress the biology, transmission dynamics, prevention and control of these organisms.

## **BIOM 250N - Microbiology for Hlth Sciences. 3 Credits.**

Offered spring. 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 Course (N)

## **BIOM 251 - Microbiology Hlth 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 360 - General Microbiology. 3 Credits.**

Offered autumn. 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 400 - Medical Microbiology. 3 Credits.**

Offered autumn. Microbial structure and functions, pathogenic microorganisms, virology, immunology. Credit not allowed toward a major in microbiology.

## **BIOM 402 - Medical Bacteriology & Mycology. 3 Credits.**

Offered spring. Prereq., BIOM 360, 361. A study of the pathogenic bacteria and fungi and the diseases they produce.

## **BIOM 403 - Medical Bacteriology & Mycology Lab. 2 Credits.**

Offered spring. Prereq. or coreq., BIOM 402. Laboratory study of pathogenic bacteria and fungi.

## **BIOM 407 - Clinical Diagnosis. 2 Credits.**

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

## **BIOM 408 - Clinical Diagnosis Lab. 1 Credit.**

Offered spring. Prereq., or coreq., BIOM 407, and BIOM 360-361 or BIOH 365 or BIOM 402/403 (may concur). Clinical diagnostic methods.

## **BIOM 410 - Microbial Genetics. 3 Credits.**

Offered spring. 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.

## **BIOM 411 - Experimental Microbial Genetics Lab. 1 Credit.**

Offered spring. Prereq. or coreq., BIOM 410. Experiments in microbial genetics: Analysis of genes and genomes.

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

Offered spring. Prereq., BIOB 260, 272, BIOM 360-361 or consent of instr. 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.

## **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.

## **BIOM 428 - General Parasitology Lab. 2 Credits.**

Offered autumn. Coreq., BIOM 427. Taxonomy, morphology and identification of parasitic protozoa, helminths and arthropods.

## **BIOM 435 - Virology. 3 Credits.**

Offered spring. Prereq., BIOB 260, and either BIOM 360 or BIOM 400. The general nature of viruses, with emphasis on the molecular biology of animal and human viruses. Co-convenes with BIOM 535.

## **BIOM 450 - Microbial Physiology. 3 Credits.**

Offered autumn. Prereq., BIOM 360-361. Microbial structure and function, physiological diversity, microbial metabolism, role of microbial activity in the environment.

## **BIOM 451 - Microbial Physiology Lab. 1 Credit.**

Offered autumn. Coreq., BIOM 450. Experimental approaches to analysis of microbial structure, composition and metabolism.

## **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.

## **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.

## **BIOM 494 - Seminar. 1 Credit.**

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

**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.

**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. Graded credit/no credit.

**BIOM 502 - Advanced Immunology. 3 Credits.**

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

**BIOM 505 - Advanced Topics in Metagenomics. 1 Credit.**

(R-8) The course comprises a study group of four faculty 4-6 graduate students and select advanced undergraduates that meets weekly to consider and discuss advances in the areas of metagenomics and bioinformatics research based on recent publications in the primary literature or on their own research findings. There are no specific course prerequisites, but the course is only appropriate for microbiology and computer science graduate and advanced undergraduate students and requires permission of the instructor for enrollment. Level: Graduate

**BIOM 535 - Advanced Virology. 3 Credits.**

Coreq., BIOB 596. 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 545 - Adv Topics in Microb Ecol. 1 Credit.**

(R-4) Offered every term. Prereq., graduate standing or consent of instr. Discussion of selected themes of the ecology of microorganisms with a focus on the recent primary literature. Level: Graduate

**BIOM 546 - Experimental Microb Ecol. 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 594 - Seminar. 1 Credit.**

(R-4) Offered autumn and spring. 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 595 - Special Topics. 1-3 Credits.**

(R-6) Offered intermittently. Prereq., graduate standing. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Level: Graduate

**BIOM 596 - Independent Study. 1-6 Credits.**

(R-6) Prereq., consent of instr. Credit for independent research project unrelated to thesis or dissertation. Level: Graduate

**BIOM 597 - Research. 1-18 Credits.**

(R-18) Offered intermittently. Prereq., graduate standing, one semester residence. 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