

Microbiology (MBIO)

Courses

MBIO A200 Experiential Learning in Fermentation Science **2 Credits**

Applies theory and lab practice in the microbiology of fermented foods and beverages and identifies beneficial and spoilage microbes. Emphasizes experimental design and execution.

Special Note: Course includes both supervised and unsupervised lab time as well as outside work.

MBIO A251 Microbiology of Fermented Foods and Beverages **2 Credits**

Discusses the microbiology of fermented foods and beverages, including relevant beneficial and spoilage microbes, important metabolic pathways, and benefits of fermentation to flavor, nutrition and shelf-life.

MBIO A340 Microbial Biology **3 Credits**

Focuses on diversity, physiology, genetics and ecology of microorganisms.

Prerequisites: BIOL A242 with a minimum grade of C and BIOL A252 with a minimum grade of C.

MBIO A342 Experiential Learning: Microbial Biology **4 Credits**

Applies theory and lab practice in microbial diversity, growth, ecology, and identification of environmental and medically-important microorganisms. Emphasizes experimental design, scientific writing and oral presentation skills.

Special Note: This experiential learning course includes supervised lab time, unsupervised lab time and outside work.

Prerequisites: (BIOL A243 with a minimum grade of C or BIOL A273 with a minimum grade of C) and MBIO A340 with a minimum grade of C or concurrent enrollment.

MBIO A410 Microbial Physiology **3 Credits**

Explores the fundamental physiological principles of microorganisms. Emphasizes cellular structure and function relationships, and growth, metabolism and metabolic regulation in the context of microbial genomics and evolution. Evaluates use of modern tools in microbial physiology research.

Special Note: Not available for credit to students who have completed MBIO A610.

May Be Stacked With: MBIO A610

Prerequisites: MBIO A340 with a minimum grade of C.

MBIO A440 Microbial Diversity **3 Credits**

Discusses molecular, biochemical and evolutionary diversity of the microbial world including Bacteria, Archaea, Eukarya and viruses. Includes concepts of microbial speciation and approaches for recognizing metabolic, phylogenetic and genomic diversity of cultivated and uncultivated bacteria.

Special Note: Not available for credit for those who have completed MBIO A640.

May Be Stacked With: MBIO A640

Prerequisites: MBIO A340 with a minimum grade of C.

MBIO A450 Microbial Ecology **3 Credits**

Explores the natural history and diversity of the microbial world.

Discusses microbial population and community ecology, the role of microorganisms in the cycling of elements, and symbioses.

Special Note: Not available for credit to students who have completed MBIO A650.

Registration Restrictions: Junior or senior standing

May Be Stacked With: MBIO A650

Prerequisites: MBIO A340 with a minimum grade of C.

MBIO A460 Host-Microbiome Interactions **3 Credits**

Explores the complex interactions of microorganisms with eukaryotic host organisms. Focuses on beneficial interactions with plants, animals and insects. Evaluates use of modern tools in host-microbiome interactions research. Emphasizes primary literature.

Registration Restrictions: Junior or senior standing

May Be Stacked With: MBIO A660

Prerequisites: BIOL A240 with a minimum grade of C or (BIOL A242 with a minimum grade of C and BIOL A252 with a minimum grade of C).

MBIO A462 Virology **3 Credits**

Introduces concepts in human virology, with an emphasis on cell and molecular biology of virus structures, viral life cycles, interactions with host cells, immune responses and disease pathogenesis. Discusses viral genomics, evolution, emergence and advanced experimental methods for analyzing virus genome sequences.

Special Note: Not available for credit to students who have completed MBIO A662.

May Be Stacked With: MBIO A662

Prerequisites: BIOL A242 with a minimum grade of C and BIOL A252 with a minimum grade of C.

MBIO A468 Geomicrobiology **3 Credits**

Examines the mutual interactions between geology and microbiology. Emphasizes microbial processes that affect local and global environments including biogeochemical cycles, co-evolution, microbe-mineral interactions and life in extreme environments.

Crosslisted With: GEOL A468

Prerequisites: MBIO A340 with a minimum grade of C or GEOL A360 with a minimum grade of C.

Attributes: UAA Integrative Capstone GER.

MBIO A470 Ecology and Evolution of Infectious Disease 3 Credits

This is a class on problem solving and critical thinking focusing on problems related to the ecological and evolutionary processes that drive the transmission of pathogens between hosts and the impact of disease on host populations. The course content includes a theoretical framework, hands-on experience with field techniques, and a discussion of wildlife and human diseases including COVID-19, Ebola, Zika, influenza (swine flu, bird flu), malaria, West Nile virus, Lyme disease, HIV, Chikungunya, tuberculosis, chytridiomycosis, and many others.

Special Note: Not available for credit to students who have completed MBIO A670.

May Be Stacked With: MBIO A670

Prerequisites: BIOL A271 with a minimum grade of C and BIOL A288 with a minimum grade of C and ((BIOL A240 with a minimum grade of C and BIOL A240L with a minimum grade of C) or MBIO A340 with a minimum grade of C or (BIOL A242 with a minimum grade of C and BIOL A252 with a minimum grade of C)).

MBIO A610 Advanced Microbial Physiology 3 Credits

Advanced course explores the fundamental physiological principles of microorganisms. Emphasizes cellular structure and function relationships, and growth, metabolism and metabolic regulation in the context of microbial genomics and evolution. Evaluates use of modern tools in microbial physiology research. Mentors and guides undergraduates in discussions of microbial physiology principles and methods.

Special Note: Not available for credit to students who have completed MBIO A410.

Registration Restrictions: Graduate standing

May Be Stacked With: MBIO A410

MBIO A640 Advanced Microbial Diversity 3 Credits

Discusses molecular, biochemical and evolutionary diversity of the microbial world including Bacteria, Archaea, Eukarya and viruses. Includes concepts of microbial speciation and approaches for recognizing metabolic, phylogenetic and genomic diversity of cultivated and uncultivated bacteria. Develops leadership and mentoring skills for undergraduates in discussions of microbial diversity principles and methods.

Special Note: Not available for credit to students who have completed MBIO A440.

Registration Restrictions: Graduate standing

May Be Stacked With: MBIO A440

MBIO A650 Advanced Microbial Ecology 3 Credits

Advanced exploration of the natural history and diversity of the microbial world. Discusses microbial population and community ecology, the role of microorganisms in the cycling of elements, and symbioses.

Special Note: Not available for credit to students who have completed MBIO A450.

Registration Restrictions: Graduate standing

May Be Stacked With: MBIO A450

MBIO A660 Advanced Host-Microbiome Interactions 3 Credits

Explores the complex interactions of microorganisms with eukaryotic host organisms. Focuses on beneficial interactions with plants, animals and insects. Evaluates use of modern tools in host-microbe interactions research. Emphasizes primary literature. Develops leadership and mentoring skills for undergraduates in discussions of host-microbe interactions principles and methods.

Special Note: Not available for credit to students who have completed MBIO A460.

Registration Restrictions: Graduate standing

May Be Stacked With: MBIO A460

MBIO A662 Advanced Virology 3 Credits

Advanced concepts in human virology. An in-depth focus on cell and molecular biology of virus structures, viral life cycles, interactions with host cells, immune responses and disease pathogenesis. Viral genomics, evolution, emergence and advanced experimental methods for analyzing virus genome sequences will be discussed.

Special Note: Not available for credit to students who have completed MBIO A462.

Registration Restrictions: Graduate standing

May Be Stacked With: MBIO A462

MBIO A670 Advanced Ecology and Evolution of Infectious Disease 3 Credits

This is a class on problem solving and critical thinking focusing on problems related to the ecological and evolutionary processes that drive the transmission of pathogens between hosts and the impact of disease on host populations. The course content includes a theoretical framework, and a discussion of wildlife and human diseases including COVID-19, Ebola, Zika, influenza (swine flu, bird flu), malaria, West Nile virus, Lyme disease, HIV, Chikungunya, tuberculosis, chytridiomycosis, and many others. Additionally, graduate students will be engaged and involved in the modeling and implementation of new analyses and interpretation of existing research.

Special Note: Not available for credit to students who have completed MBIO A470.

May Be Stacked With: MBIO A470