

# MICROBIOLOGY (MCRO)

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## MCRO Courses

### MCRO 100. Introduction to Microbiology Research. 2 units

Term Typically Offered: W

CR/NC

Group research experience in microbiology through participation in a faculty-student research project. Foundations of the scientific method including literature review, design of experiments, common laboratory techniques, data analysis, interpretation of results and scientific communication. Intended for freshmen and sophomores with no research experience. Priority to MCRO majors. Credit/No Credit grading only. 1 seminar, 1 laboratory.

### MCRO 221. Microbiology. 4 units

Term Typically Offered: F,W,SP,SU

2020-21 or later catalog: GE Area B2

2020-21 or later catalog: GE Area B3

2019-20 or earlier catalog: GE Area B2

2019-20 or earlier catalog: GE Area B4

Prerequisite: CHEM 110 or CHEM 124 or CHEM 127.

Microbial classification and identification, cell structure and function, metabolism, microbial systems and evolutionary processes, with applications to industry, agriculture, food production, environment, and health. Not open to students with credit in MCRO 224; not for credit for Biology and Microbiology majors. 3 lectures, 1 laboratory. Fulfills GE Areas B2 and B3 (GE Areas B2 and B4 for students on the 2019-20 or earlier catalogs).

### MCRO 224. General Microbiology I. 5 units

Term Typically Offered: F, W, SP

2020-21 or later catalog: GE Area B2

2020-21 or later catalog: GE Area B3

2019-20 or earlier catalog: GE Area B2

2019-20 or earlier catalog: GE Area B4

Prerequisite: BIO 161; and CHEM 125 or CHEM 128. Recommended: CHEM 129.

Fundamental concepts of prokaryotes, eukaryotic microorganisms and microbiological entities. Microbial taxonomy, classification, cellular structure and function, metabolism, growth dynamics and control. Introduction to microbial genetics and molecular techniques. Microbial interaction with human and society. Fundamental laboratory techniques in microbiology. 3 lectures, 2 laboratories. Fulfills GE Areas B2 and B3 (GE Areas B2 and B4 for students on the 2019-20 or earlier catalogs).

### MCRO 225. General Microbiology II. 5 units

Term Typically Offered: SP

Prerequisite: MCRO 224.

Microbial diversity, systematics, ecology, and symbiotic relationships. Introduction to host-microorganism interactions including pathogenesis, epidemiology, and immunology. 3 lectures, 2 laboratories.

### MCRO 301. Wine Microbiology. 4 units

Term Typically Offered: SP

Prerequisite: MCRO majors must have MCRO 224; WVIT majors must have MCRO 221 or MCRO 224; and WVIT 202; open to MCRO or WVIT majors only.

Wine yeasts, bacteria, and molds: morphology and methods of identification; successful alcoholic and malolactic fermentations; management and prevention of unwanted microbial growth; microorganisms and flavor development. 3 lectures, 1 laboratory. Crosslisted as MCRO/WVIT 301.

### MCRO 320. Emerging Infectious Diseases. 3 units

Term Typically Offered: F,W,SP,SU

Prerequisite: BIO 161; and MCRO 221 or MCRO 224.

Recent outbreaks of human diseases, interrelationships between infectious disease agents, human biology, and the environment. Infectious agents and disease processes, virulence mechanisms, and host immune response. Clinical approaches and surveillance methods to detect, investigate, and monitor emerging pathogens. Factors involved in the accelerating emergence of diseases and bioterrorist agents. 3 lectures.

### MCRO 342. Public Health Microbiology. 4 units

Term Typically Offered: W, SP

Prerequisite: MCRO 221 or MCRO 224.

Principles of disease prevention and control. Water-, food-, and air-borne microbial contaminations and epidemiology of ensuing diseases. 3 lectures, 1 laboratory.

### MCRO 402. General Virology. 4 units

Term Typically Offered: W

Prerequisite: BIO 351 or CHEM 373, or graduate standing in Biological Sciences. Recommended: BIO 452.

Infective macromolecules (prions, viroids, and viruses) associated with microbes, plants, and animals. Epidemiology, immune responses, pathogenicity, carcinogenesis, diagnoses, vaccination, and therapy. 3 lectures, 1 laboratory.

### MCRO 421. Food Microbiology. 4 units

Term Typically Offered: F, SP

Prerequisite: MCRO 221 or MCRO 224. Recommended: CHEM 212/312.

Physiological activities of microorganisms involved in the preparation, preservation, deterioration, and toxicity of foods and related products. Detection and prevention of spoilage microorganisms and foodborne pathogens. 3 lectures, 1 laboratory.

### MCRO 423. Medical Microbiology. 5 units

Term Typically Offered: F

Prerequisite: Junior standing; MCRO 225; and CHEM 216, CHEM 312 or CHEM 316; and consent of instructor.

Microorganisms as agents of disease in humans. Epidemiology, host-parasite relationships, and chemotherapy. The compromised host and opportunistic disease. Laboratory safety. Procedures for laboratory diagnosis of human diseases. Rapid miniaturized methods of identification. 3 lectures, 2 laboratories.

**MCRO 424. Microbial Physiology. 5 units**

Term Typically Offered: W

Prerequisite: MCRO 225 and CHEM 313 or CHEM 371, or graduate standing in Biological Sciences.

Cellular structure and life processes of bacteria; chemical composition, growth, and metabolism. General biological and evolutionary considerations. 3 lectures, 2 laboratories.

**MCRO 433. Microbial Biotechnology. 3 units**

Term Typically Offered: F

Prerequisite: MCRO 221 or MCRO 224; and BIO 303 or BIO 351 or equivalent; and CHEM 216, CHEM 312 or CHEM 316 or equivalent, or graduate standing in Biological Sciences.

Principles and methods used for production of enzymes, pharmaceuticals, chemicals, and food additives using micro-organisms. Topics include screening and strain improvement, regulation of metabolite production, genetic engineering, heterologous gene expression systems, large-scale production, and intellectual property. 3 lectures.

**MCRO 436. Microbial Ecology. 4 units**

Term Typically Offered: SP

Prerequisite: BIO 160; BIO 161; BIO 263; and MCRO 221 or MCRO 224; or graduate standing in Biological Sciences.

Ecology and interactions of microorganisms in natural environments. Role of microorganisms in ecosystem function such as nutrient cycling, extreme environments, symbioses. Applications of microorganisms in the environment such as bioremediation, biocontrol, biofuels. Field trip may be required. 2 lectures, 2 activities.