

## 2007-09 Cal Poly Catalog

### Biological Sciences Department

## MCRO–MICROBIOLOGY

### MCRO 221 Microbiology (4) GE B2 & B4

Morphology, metabolism, classification, and identification; microbiology of air, soil, water, and foods with applications to industry, agriculture, medicine, and public health. Not open to students with credit in MCRO 224; not for credit for Biology and Microbiology majors. 3 lectures, 1 laboratory. Prerequisite: One quarter of chemistry.

### MCRO 224 General Microbiology I (5) GE B2 & B4

Microbial cellular structure and function, nutrition and growth dynamics, control of microbial growth, metabolism, genetics, and viruses. Both prokaryotic and eukaryotic microorganisms emphasized. 3 lectures, 2 laboratories. Prerequisite: BIO 161 and CHEM 128. Recommended: CHEM 129.

### MCRO 225 General Microbiology II (5)

Microbial diversity, systematics, ecology, and symbiotic relationships. Introduction to host-microorganism interactions including pathogenesis, epidemiology, and immunology. 3 lectures, 2 laboratories. Prerequisite: MCRO 224 or consent of instructor.

### MCRO 320 Emerging Infectious Diseases (3)

Recent outbreaks of human diseases, interrelationships between infectious disease agents, human biology, and the environment. Infectious agents and disease processes, surveillance methods to detect, investigate, and monitor emerging pathogens. Factors involved in the accelerating emergence of diseases and bioterrorist agents. 3 lectures. Prerequisite: MCRO 221 or MCRO 224 or BIO 161.

### MCRO 342 Sanitary Microbiology (4)

Principles of disease prevention and control. Water-, food-, and air-borne microbial contaminations and epidemiology of ensuing diseases. 3 lectures, 1 laboratory. Prerequisite: MCRO 221 or MCRO 224.

### MCRO 402 General Virology (4)

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. Prerequisite: BIO 351 or CHEM 373. Recommended: BIO 452.

### MCRO 421 Food Microbiology (4)

Physiological activities of microorganisms involved in the preparation, preservation, deterioration, and toxicity of foods and related products. 2 lectures, 2 laboratories. Prerequisite: MCRO 221 or MCRO 224. Recommended: CHEM 212/312.

### MCRO 423 Medical Microbiology (5)

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. Prerequisite: MCRO 225 and CHEM 312 or CHEM 316.

### MCRO 424 Microbial Physiology (5)

Cellular structure and life processes of bacteria; chemical composition, growth, and metabolism. General biological and evolutionary considerations. 3 lectures, 2 laboratories. Prerequisite: MCRO 225 and CHEM 313 or CHEM 371.

### MCRO 433 Microbial Biotechnology (3)

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. Prerequisite: MCRO 221

or MCRO 224, and BIO 303, BIO 351 or equivalent, and CHEM 312, CHEM 316 or equivalent.

### MCRO 436 Environmental Microbiology (4)

Ecology and interactions of microorganisms in natural environments. Fundamentals of microbial ecology, microbes and ecosystem function, and practical aspects of microbes in the environment: nutrient cycling, extreme environments, symbioses, bioremediation, biocontrol, biofuels. 2 lectures, 2 activities. Prerequisite: BIO 160 and BIO 161, or MCRO 221, or MCRO 224.

### MCRO 461 Senior Project – Research Proposal (2)

Completion of a research proposal and literature review, including analysis of experimental results from published peer-reviewed articles covering issues in microbiology, culminating in both written and oral presentations. 2 activities. Prerequisite: Junior standing or consent of instructor.