

# MICROBIOLOGY (MICR)

## MICR 309 Introduction to Mycology 4 Credit Hours

An introduction to the biology of the fungi. Classification, structure, industrial use, gastronomic qualities, and disease-producing ability of macroscopic and microscopic forms are studied. Laboratories include microscopic and macroscopic examinations of fungi, and their growth and field studies on the occurrence and classification of edible and poisonous varieties. Three hours lecture, four hours laboratory. (OC).

**Prerequisite(s):** BIOL 130 and BIOL 140

## MICR 380 Epidemiology 3 Credit Hours

Introduces the methods for infectious disease epidemiology (occurrence and spread in population) and case studies of important disease syndromes and entities. Methods include definitions and nomenclature, outbreak investigations, disease surveillance, case-control studies, cohort studies, laboratory diagnosis, molecular epidemiology, dynamics of transmission, and assessment of vaccine field effectiveness. Case-studies focus on acute respiratory infections, diarrheal diseases, hepatitis, HIV, tuberculosis, sexually transmitted diseases, malaria and other vector-borne diseases. This course emphasizes methods of study that would contribute to understanding disease etiology.

**Prerequisite(s):** BIOL 140

## MICR 385 Microbiology 4 Credit Hours

The biology of microorganisms is considered through study of the properties of bacteria, fungi, algae, protozoa, and viruses. Microbial structures are discussed and correlated with their function. Aspects of cellular metabolism pertinent to microorganisms are emphasized. The interaction of microorganisms and their environment, animate and inanimate, is discussed with respect to the beneficial or harmful effects of the different microbial groups. Laboratory exercises introduce the student to basic, practical microbiological techniques and illustrate various principles of microbial life. Three hours lecture, four hours laboratory. (F,S).

**Prerequisite(s):** BIOL 140 and (CHEM 134\* or CHEM 144\*)

**Corequisite(s):** MICR 385L

## MICR 390 Topics in Microbiology 1 to 6 Credit Hours

Current topics in microbiology will be presented through a lecture, discussion and/or laboratory format. Topics will vary, as appropriate, and may cover any area of microbiology including studies on bacteria, algae, fungi, protozoa, viruses, biotechnology, mechanisms of pathogenesis and immunology. (OC).

**Prerequisite(s):** BIOL 385 or MICR 385

## MICR 405 Applied & Environ Microbiology 4 Credit Hours

Advanced treatment of the interplay of microorganisms and the environment. Topics will include soil and water microbiology (bacteria, archaea, fungi, algae, protozoans and viruses) and plant-microbe interactions (pathogenic and symbiotic) as well as the role of microorganisms in decomposition, nutrient cycling (carbon, nitrogen, sulfur and metal cycling), wastewater and biosolids treatment, and bioremediation. 3 hr lec, 1-4 hr lab. For graduate credit elect MICR 505.

**Prerequisite(s):** MICR 385 or BIOL 385

**Restriction(s):**

Can enroll if Class is Senior

## MICR 406 Microbial Genetics 3 Credit Hours

A course that emphasizes the genetics and molecular biology of bacteria and their viruses. Topics include DNA structure and replication, recombination, DNA repair, genetic mapping, mechanisms of gene transfer, regulation of gene expression, mutagenesis, and recombinant DNA techniques. (YR, W).

**Prerequisite(s):** MICR 385 or BIOL 385 or BIOL 306

## MICR 430 Medical Virology 3 Credit Hours

The course provides a general description of the history and nature of animal virus disease. Emphasis is placed on the pathogenesis and clinical description of specific diseases. Three hours lecture.

**Prerequisite(s):** MICR 385 or BIOL 385

## MICR 440 Micro Genetics & Physi Lab 1 Credit Hour

This course emphasizes the use of advanced microbiological techniques for understanding the genetics and physiology of microorganisms. Experiments focus on the understanding of general microbial phenomena, such as nutrition, metabolism and biochemistry; protein and nucleic acid synthesis; energy generation, enzyme regulation, membrane transport, motility, differentiation, cellular communication and the behavior of populations.

**Prerequisite(s):** BIOL 385\* or MICR 385\* or BIOL 301\* or BIOL 406\* or MICR 406\* or BIOL 485\* or MICR 485\*

**Restriction(s):**

Cannot enroll if Class is Freshman

Can enroll if Level is Undergraduate

## MICR 450 Virology 4 Credit Hours

The first half of this course deals with bacterial viruses, with emphasis on classical events in this field. The second half surveys the field of animal viruses, with emphasis on recent discoveries, including replication, pathogenesis, and viral association with cancers. Three hours lecture, four hours laboratory. (AY,W).

**Prerequisite(s):** (BIOL 385 or MICR 385) and CHEM 226

## MICR 455 Immunology 4 Credit Hours

A detailed study of the field of immunology. Among the topics covered are various aspects of the immunological response, such as humoral or cell-mediated immunity, cell-cell interactions, and immunology as related to the cause and prevention of disease. Three hours lecture, four hours laboratory. (AY,F).

**Prerequisite(s):** BIOL 385 or BIOL 301 or MICR 385

## MICR 459 Pathogenic Microbiology 4 Credit Hours

An introduction to pathogenic microorganisms and mechanisms of microbial pathogenicity. Disease-causing bacteria, fungi, viruses, and protozoa are studied. Laboratories emphasize clinical approaches to isolation, identification, and treatment. Three hours lecture, four hours laboratory. (AY,F).

**Prerequisite(s):** BIOL 385 or MICR 385

## MICR 485 Physiology of Microorganisms 3 Credit Hours

An in-depth examination of the physiology of microorganisms. Areas of emphasis include the growth and nutrition of microorganisms, the development of viruses, the microbial degradation of organic compounds, the regulation of degradation reactions, and the biosynthesis of uniquely microbial compounds and secondary metabolites, such as antibiotics and toxins. Consideration is given to the natural environments of specific microorganisms. (YR, W).

**Prerequisite(s):** (BIOL 385 or MICR 385 or BIOL 370 or CHEM 370 or BCHM 370) and CHEM 225\*

**MICR 495 Off-Campus Research 1 to 3 Credit Hours**

Participation in ongoing experimental research at an off-campus laboratory (or in the field). Arrangements made between the research laboratory, (director of field study), the student, and the microbiology concentration advisor. No more than 6 hours combined from MICR 495, 498, and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours laboratory. Permission of concentration advisor. (F,W,S).

**MICR 497 Seminar in Microbiology 1 Credit Hour**

Topics of current interest in microbiology will be presented by guest lecturers, faculty members or students. Topics chosen will vary from term to term. Can be elected up to three times. One hour seminar. Permission of instructor. (W).

**MICR 498 Ind Study in Microbiology 1 to 3 Credit Hours**

Library research and independent study performed under the guidance of a faculty member. Four to twelve hours readings. (F,W,S).

**MICR 499 Lab in Micro Research 1 to 3 Credit Hours**

Directed laboratory research performed under the guidance of a faculty member. Four to twelve hours laboratory. Permission of instructor. (F,W,S).

\* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally