

Minnesota State College Southeast

BIOL 2531: Microbiology

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 2

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites:

This course requires any of these four prerequisites

CHEM 2518 - General, Organic & Biochemistry I

BIOL 1201 - Introduction to Biology

BIOL 1200 - Human Biology

BIOL 1001 - Introduction to the Cell

Corequisites: None

MnTC Goals: Goal 03 - Natural Science

Microbiology explores the general characteristics, classification, and pathology of microscopic organisms. Fundamental aspects of microbial control, growth, reproduction, and metabolism, are explored with relation to the role they play in human health, disease, and immunity. Basic laboratory procedures, such as staining techniques, nutrient preparation, microbial isolation, and microorganism identification are introduced in the laboratory component of this course. (Fulfills MnTC goal 3) (Prerequisite: CHEM2518 or BIOL1200 or BIOL1201 or BIOL1001 or equivalent) (3 credits: 2 lecture/1 lab)

B. COURSE EFFECTIVE DATES: 01/28/2014 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Exploration of the Microscopic World
2. Growth, Metabolism, & Genetics of Microorganisms
3. Classifications of Microorganisms
4. Microorganisms & Disease
5. Human Defenses Against Disease

D. LEARNING OUTCOMES (General)

1. Give a historical perspective and relate human welfare and disease to the study of microbiology
2. Describe how microscopy and staining techniques are used in the study of microbiology
3. Describe how organisms are classified, the methods used for classification/identification, categorize prokaryotes/eukaryotes and describe their major characteristics
4. Describe metabolic principles and relate them to biochemical tests for bacterial identification, the minimal requirement for bacterial growth, and describe the different phases and measurement of bacterial growth
5. Briefly describe the structure and replication of the bacterial genome, describe the mechanism of RNA and protein synthesis, and relate bacterial genome structure to regulating gene expression
6. List the general characteristics, describe the structure, and relate structures to the function of viruses with regard to their lifecycle, mode of infection, and resistance to treatment
7. Explain the basic classifications of infectious diseases, how they are transferred, how they spread and measures used to prevent the spread of disease
8. Describe the body's nonspecific immune defenses, the process of phagocytosis, and the inflammatory response
9. Identify and describe the major components of the immune system and describe how they function normally and describe disorders of the immune system
10. Relate practical applications of immunology, such as vaccines and ELISA's, to the normal functioning of the immune system
11. Relate the exploited structure/metabolism of microorganisms to the function of antimicrobial drugs

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted