Anoka Technical College

BIOL 2106: Microbiology

A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 3

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites:
This course requires the following prerequisite
BIOL 1106 - Principles of Biology

Corequisites: None

MnTC Goals: Goal 02 - Critical Thinking, Goal 03 - Natural Science

Microbiology is a science course designed to prepare students with a working knowledge of how microorganisms affect our daily life. Emphasis will be placed on the study of prokaryotic and eukaryotic microorganisms including bacteria, viruses, fungi, and other life forms. The study of growth, metabolism, reproduction, evolution and ecology of microorganisms will help the student to understand host-pathogen interactions, pathogenesis of disease, and immunological response. Microbiology research articles and case studies will be utilized to provide students with relevance into how microbes are used in such fields as Agriculture, Food Science, Horticulture, Nursing/Healthcare, Pharmacology, Biomedical Technology and National Security (i.e. Bioterrorism). (Prerequisite: BIOL 1106) (MN Transfer Goals 2 and 3) (3 credits lecture/1 credit lab)

B. COURSE EFFECTIVE DATES: 05/28/2008 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

D. LEARNING OUTCOMES (General)

1. Apply terminology, concepts and theories of fundamental importance in microbiology.
2. Identify the most common environmental and chemical change agents and the resulting affects on microorganisms.
3. Research and summarize current microbiology articles to describe colony and microscopic characteristics of selected microbes, and identify unknown microbes by following flow diagrams, scientific method and internet/library research.
4. Research scientific perspectives relating to controversial issues in society.
5. The student will describe and integrate basic microbiological principles and define basic microbiological terminology presented in lecture, required textbooks, and other instructional materials, citing specific examples.
6. Demonstrate an understanding of microbiological concepts, uses of microorganisms in medical and industrial settings that require standard precautions to protect themselves and others when working with infectious organisms.
7. Develop a basic knowledge and understanding of major integrating concepts of microbial taxonomy, growth and evolution of microorganisms.
8. Explain how microorganisms utilize diverse ecosystems to survive and relate this to human interactions with them in health and disease.
9. Understand how scientific inquiry is conducted and the kinds of questions and answers that are meaningful in a scientific context.
10. Identify the transmission, growth, control of microbes; understand the importance and significance of microbiology, and apply the information to fields such as Agriculture, Food Science, Horticulture, Nursing/Healthcare, Pharmacology, Biomedical Technology and National Security (i.e. Bioterrorism).
11. Articulate and diagram the role of the immune system in maintaining homeostasis, challenging infections and fighting cancer.
12. Compare and contrast the characteristics of prokaryotic and eukaryotic organisms and discuss the science of taxonomy in regards to infections, treatments and controls.
13. Compare human viruses to bacteriophages and discuss the microbial life cycles.
14. Describe and discuss the exploitation of microbes in the area of industrial or environmental microbiology and biotechnology.
15. Describe concepts of growth, metabolism, reproduction and evolution of microorganisms.
16. Describe the beneficial and harmful roles and interrelationships that microbes play in human health and disease.
17. Explore how genetic information is acquired and exchanged by microorganisms.
18. Identify and describe the structure of both bacteria and viruses and the etiology of disease.

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

Goal 02 - Critical Thinking

1. Gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive, and conscious of possible bias in the information selected.
2. Imagine and seek out a variety of possible goals, assumptions, interpretations, or perspectives which can give alternative meanings or solutions to given situations or problems.
3. Analyze the logical connections among the facts, goals, and implicit assumptions relevant to a problem or claim; generate and evaluate implications that follow from them.
4. Recognize and articulate the value assumptions which underlie and affect decisions, interpretations, analyses, and evaluations made by ourselves and others.

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.
4. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted