

# North Hennepin Community College

## **BIOL 2100: Microbiology**

### **A. COURSE DESCRIPTION**

Credits: 4

Lecture Hours/Week: 3

Lab Hours/Week: 3

OJT Hours/Week: \*.\*

Prerequisites:

This course requires either of these prerequisites

BIOL 1001 - Biology I (Minimum grade: 1.67 GPA Equivalent)

BIOL 1101 - Principles of Biology I (Minimum grade: 1.67 GPA Equivalent)

Corequisites: None

MnTC Goals: Goal 03 - Natural Science

This course is a study of bacteria, viruses, fungi and protozoa, infection, immunity, human diseases and microbiology of food and water. Laboratory exercises stress detection, isolation and control of microorganisms. (3 hours lecture, 3 hours lab)

Prerequisite: Biol 1001 or 1101 with grade of "C" or better

**B. COURSE EFFECTIVE DATES:** 08/25/1997 - Present

### **C. OUTLINE OF MAJOR CONTENT AREAS**

1. Course content standards derived from the ASM (American Society of Microbiology). Content focuses on disease, pathogenesis, and the types of organisms that cause disease. Topics also include molecular technology, application of the use of microorganisms in food production including food and water safety, antimicrobials, vaccines, biotechnology.

## **D. LEARNING OUTCOMES (General)**

1. Analyze and discuss the history and development of microbiology including major players, events, and ideas. (MnTC G 2 comp c, d; MnTC G 3 comp a, d; NHCC ELO 1 & 2 & 3)
2. Describe the metabolic and organismal diversity of microbes, and their taxonomy. (MnTC G 3 comp a; NHCC ELO 1 & 2)
3. Describe the central role of microbes in biology, evolution, and life's history. (MnTC G 2 b, c; MnTC G 3 comp a; NHCC ELO 1 & 2)
4. Describe the role of microbes in disease and health of humans and other organisms and compare and contrast processes of host defense vs. pathogenesis. (MnTC G 2 comp c; MnTC G 3 comp a; NHCC ELO 1 & 2)
5. Discuss the dynamic influence of microbes in the environment, agriculture, and food and water safety. (MnTC G 3 comp a, b, c ; NHCC ELO 1)
6. Describe the role of microbes in biotechnology and genetic engineering. (MnTC G 2 comp b; NHCC ELO 1 & 2)
7. Discuss the causes, consequences, and significance of exchange and acquisition of genetic information and mutation.
8. Describe the factors and requirements for growth and reproduction of microbes. (MnTC G 3 comp a; NHCC ELO 1 & 4)
9. Compare and contrast the physical, chemical, and chemotherapeutic methods of microbial control and its challenges. (MnTC G 2 comp a; MnTC G 3 comp a, b, c ; NHCC ELO 1 & 2)
10. Diagram the transmission of disease, the dissemination of disease information, and describe the tools of epidemiologists and public health professionals in controlling disease. (MnTC G 3 comp a, b, c ; NHCC ELO 1 & 2)
11. Demonstrate proficiency in the safe and aseptic manipulation of microbes. ( NHCC ELO 2 & 4)
12. Demonstrate proper pipetting and micropipetting technique and accurate serial dilution technique. (NHCC ELO 2 & 4)
13. Demonstrate proper use, care, and cleaning of the bright field microscope. ( NHCC ELO 2 & 4)
14. Demonstrate the use of scientific inquiry in identification of an unknown bacterium using specialized staining techniques, biochemical tests, and authoritative resources. (MnTC G 2 comp a, b, c; MnTC G 3 comp b, c; NHCC ELO 2 & 4)
15. Demonstrate observational, organizational, and critical thinking skills in accurately recording macroscopic and microscopic data, maintaining a laboratory notebook, and analyzing experimental results. (MnTC G 2 comp a, b, c; MnTC G 3 comp b, c; NHCC ELO 2 & 4)
16. Demonstrate the ability to work effectively in groups in applying subject knowledge to new problems, sharing information and data, and analyzing and reporting results through oral, written, or graphical presentations. (MnTC G 2 comp d; MnTC G 3 comp a, b, c ; NHCC ELO 2 & 4)

## **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**

1. Knowledge of Human Cultures and the Physical and Natural World --Through study in the sciences, mathematics, social sciences, humanities, histories, languages, the arts, technology and professions.
2. Intellectual and Practical Skills - Including: Inquiry and analysis; Critical and creative thinking; Written and oral communication; Quantitative literacy; Information literacy; Teamwork and problem solving.
3. Personal and Social Responsibility and Engagement - Including: Civic knowledge and involvement - campus, local and global; Intercultural knowledge and competence; Ethical reasoning and action; Foundations and skills for lifelong learning.
4. Integrative and Applied Learning - Including: Synthesis and advanced accomplishment across general education, liberal studies, specialized studies and activities in the broader campus community