

ROCHESTER COMMUNITY & TECHNICAL COLLEGE

COMMON COURSE OUTLINE: Course discipline/number Biology 2021

A. CATALOG DESCRIPTION (include prerequisites)

Course Title: General Microbiology
Credits: 4
Hours/Week: 3 hours lecture and 3 hours lab per week (lab 11 weeks only)
Semesters Offered: Fall, Spring, Summer
Prerequisites: BIOL 1217 or BIOL 1220 or equivalent college course and CHEM 1117 or equivalent college course

This course meets the requirements for the Minnesota Transfer Curriculum in CT (Critical Thinking) and NS (Natural Science).

This course covers basic microbiological principles and the nature of the host-pathogen relationship. The course is intended primarily for students preparing for programs in nursing (2 yr. and 4 yr. degree programs), medical technology, physical therapy, veterinary medicine, pharmacy, respiratory therapy, medicine, dental hygiene and medical laboratory technology.

B. DATE LAST REVISED (use current date): January 2000

C. RECOMMENDED ENTRY SKILLS/KNOWLEDGE:

College-level reading and writing skills and working knowledge of elementary algebra

D. OUTLINE OF MAJOR CONTENT AREAS:

1. Characteristics of microbial life forms
2. Bacterial morphology and staining characteristics
3. Growth requirements of bacteria
4. Bacterial genetics
5. Control of microbial growth (physical, chemical, chemotherapeutic)
6. Bacterial groups of medical importance
7. Eukaryotic microbes: fungi and protozoa
8. Viruses
9. Principles of disease - infection and transmission
10. Host defense mechanisms: specific and nonspecific

The laboratory exercises are designed to introduce basic microbiological culture and identification techniques to the students. In addition, the students are required to analyze experimental data and report the results. The following list illustrates the types of exercises included in the laboratory experience:

1. Use of the microscope for observation of microbes
2. Performance and interpretation of basic microbiological stains
3. Use of aseptic technique for handling and transferring microbes
4. Maintenance of cultures of various types
5. Performance and interpretation of basic tests used in identifying microbes
6. Determination of microbial sensitivity to various physical, chemical, and chemotherapeutic agents
7. Estimation of bacterial numbers using serial dilution and turbidometric techniques
8. Identification of unknown microbes

E. LEARNING OUTCOMES (GENERAL):

1. The student will develop a basic understanding of microbial life forms.
2. The student will learn basic aseptic procedures necessary for working in laboratories and hospitals.
3. The student will understand the role of microbes in the environment.
4. The student will gain knowledge of selected fungal, viral, protozoal and bacterial diseases and the host response to these diseases.

F. LEARNING OUTCOMES (MNTC):

Critical Thinking

- a. Gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive and conscious of the bias in the information selected
- b. Imagine and/or seek out a variety of possible goals, assumptions, or perspectives which can give meaning to a given problem
- c. Analyze the logical connections between facts, goals and assumptions relevant to a problem, and evaluate claims which may be said to follow from them
- d. Describe and improve one's own critical thinking and problem solving procedures

Natural Sciences

- a. Demonstrate understanding of scientific theories and the ways in which scientists develop, express, and question theories in the field of microbiology.
- b. Formulate and test hypothesis by performing laboratory experiments requiring collection of data, its statistical and/or graphical analysis, and an appreciation of uncertainty and sources of error
- c. Communicate their findings, analyses, and interpretations with other students and/or instructor orally and/or in writing.

G. METHODS FOR EVALUATION OF STUDENT LEARNING:

1. Theory exams over lecture material
2. Homework assignments and quizzes
3. Laboratory quizzes
4. Laboratory reports

H. SPECIAL INFORMATION (fees, directives on hazardous materials, etc.):

The initial lab session explains and familiarizes the student with general safety hazards and safety equipment in the lab. During the pre-lab discussion, the hazardous characteristics of any materials used during the lab are discussed. In addition, the students are instructed on the proper handling and disposal of all potentially infectious material. The instructor will direct all students to wear necessary protective equipment while working with any hazardous chemicals. A copy of Material Safety Data Sheets for chemicals used is available in the lab.