

# Minnesota State University Moorhead

## BIOL 438: Medical Microbiology

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 4

Lab Hours/Week: 0

OJT Hours/Week: \*.\*

Prerequisites:

This course requires both of these prerequisites

BIOL 350 - Microbiology

BIOL 350L - Microbiology Lab

Corequisites: None

MnTC Goals: None

A survey of the major bacterial and viral infectious disease agents and their associated diseases in humans.

**B. COURSE EFFECTIVE DATES:** 01/10/2011 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. The basic principles of microbiology introduced in the prerequisite course are expanded upon.
2. The basic concepts of the immune response introduced in the prerequisite microbiology course are extended and addressed in terms of general and specific infectious disease prevention and pathology.
3. The mechanisms of bacterial pathogenesis are detailed.
4. The classic bacterial pathogens and opportunistic pathogens are examined in detail with respect to their physiology and structure, virulence factors, pathogenesis and immunity, epidemiology, diagnosis, clinical diseases, treatment, prevention and control.
5. The mechanisms of viral pathogenesis are detailed.
6. Representative viral infectious disease agents are examined in terms of their physiology and structure, virulence factors, pathogenesis and immunity, epidemiology, diagnosis, clinical diseases and syndromes, treatment, prevention and control.
7. Critical thinking will be emphasized and assessed throughout the course.
8. Medical terminology and professional communication will be emphasized throughout the course.

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

1. Students will develop a deep knowledge and understanding of the nature of bacterial pathogens.
2. Students will become familiar with and understand the pathogenesis and epidemiology of bacterial pathogens.
3. Students will recognize there are four fields of medical microbiology: medical bacteriology, clinical virology, medical mycology and medical parasitology.
4. Students will be able to understand how a patient's symptoms and laboratory findings are used to diagnose infectious disease typically by following algorithms that will help to rule out possible pathogens
5. Students will appreciate the relationships between microbes, the immune system and disease outcomes.
6. Students will demonstrate critical thinking and problem-solving skills.
7. Students will demonstrate their ability to effectively communicate course content by preparing and delivering a lecture to their peers and instructor.
8. Upon completion of the course, the students should have acquired the knowledge to be able to answer the following questions about each infectious agent covered:
  - a. How is a pathogen identified?
  - b. What diseases does the pathogen cause?
  - c. Which epidemiological risk factors make an individual susceptible to infection/disease?
  - d. How is the pathogen transmitted to a human host?
  - e. What are the virulence factors of the pathogen?
  - f. How does the host defend itself against the pathogen?
  - g. How is infection by the pathogen treated?
  - h. Is there a vaccine that can prevent subsequent infection

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

None

#### **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

#### **G. SPECIAL INFORMATION**

None noted