

**J. Sargeant Reynolds Community College
Course Content Summary**

Course Prefix and Number: MDL 251

Credits: 3

Course Title: Clinical Microbiology I

Course Description: Teaches handling, isolation, and identification of pathogenic microorganisms. Emphasizes clinical techniques of bacteriology and mycology. Part I of II. Prerequisite or Co-requisite: MDL 101. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

General Course Purpose: Provides theory and techniques required for safe collection, handling, isolation, and identification of bacteria commonly encountered in the clinical laboratory. Theory and tests are related to disease states and diagnosis. Topics include purpose of various types of cultivation media; staining techniques and microscopy; identification methods (conventional, commercial kits, and reagents); safety skills required for handling infectious organisms; correlation with human disease.

Course Prerequisites and Co-requisites:

Prerequisite or Co-requisite: MDL 101

Student Learning Outcomes:

Upon completing the course, the student will be able to

- a. Describe and practice safe handling of infectious specimens and organisms;
- b. Apply the rules for correct microbiology nomenclature;
- c. Identify proper media and cultivation techniques;
- d. Describe proper incubation and atmospheric conditions;
- e. Perform a gram stain procedure and read using the oil immersion objective;
- f. Perform major biochemical tests related to identification of key organisms;
- g. Describe the colonial, microscopic, and biochemical characteristics of Staphylococcus, Streptococcus, Micrococcus, and Enterococcus;
- h. Describe the colonial, microscopic, and biochemical characteristics related to Enterobacteriaceae, Pseudomonas, Acinetobacter, and Stenotrophomonas;
- i. Distinguish the differences between Haemophilus, Helicobacter, Campylobacter, Vibrio, Pasteurella, and Bordetella based on testing tables, gram stains, and colony morphology;
- j. Describe characteristics related to identification of Neisseria, Moraxella, Bacillus, Listeria, Ersiplothrix, Bacteroides, Clostridium, and Fusobacterium;
- k. Summarize the principle, purpose, and sources of error for related differential tests;
- l. Differentiate pathogenic from commensal organisms;
- m. Describe the appropriate clinical manifestation and patient symptoms; and
- n. Describe treatment options.

Major Topics to Be Included:

- a. Basic principles of microbiology
- b. Safety in the microbiology lab
- c. Nomenclature
- d. Media and cultivation
- e. Microscopy
- f. Staphylococcus and streptococcus
- g. Enterobacteriaceae

- h. Pseudomonas and similar organisms
- i. Haemophilus
- j. Campylobacter, helicobacter, vibrio
- k. Bordetella, Pasteurella, Legionella
- l. Neisseria and Moraxella
- m. Gram positive rods
- n. Anaerobes
- o. Quality control

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