

# EFFECTIVE: JANUARY 2013 CURRICULUM GUIDELINES

**A.** Division: Academic Effective Date: January 2013

**B.** Department / Faculty of Science & Technology / Revision  New Course   
 Program Area: Biology

If Revision, Section(s) Revised: A, H

Date of Previous Revision: March 2006

Date of Current Revision: June 2012

**C:** BIOL 2401 **D:** Introductory Microbiology for Health Sciences **E:** 3

	Subject & Course No.	Descriptive Title	Semester Credits
<b>F:</b>	Calendar Description:		
	<p>A survey of the biology of microorganisms with an emphasis on bacteria. Topics include prokaryotic diversity, bacterial cell structure and metabolism, and microbial reproduction. Introductory virology and immunology, epidemiology and public health, and selected topics in medical microbiology. Laboratory activities introduce a wide variety of techniques in microbiology and immunology.</p>		

**G:**

**M:** Course Objectives / Learning Outcomes

Upon completion of this course, students will:

1. Understand the range of prokaryotic and eukaryotic organisms that are considered to be microorganisms and understand the historical context of microbiological science.
2. Be able to explain the components and cellular structure of bacterial cells.
3. Understand the principles of classification and be able to explain the classification of bacteria.
4. Be able to explain the process of bacterial cell division and relate it to the growth of bacterial populations and understand the principles involved in the control of bacterial growth.
5. Understand the structure of viruses, viral replication and the role of viruses in disease.
6. Be able to explain the difference between innate and acquired immunity to disease in humans and how they are affected by humoral and cell-mediated responses.
7. Understand the mechanisms of microbial pathogenesis.
8. Be able to explain the modes of transmission and mechanisms of infection by human bacterial diseases and strategies for management of transmission and infection in the context of public health.
9. Understand the basis of the development of bacterial resistance to antimicrobial agents.
10. Be familiar and competent with a wide variety of microbiological laboratory techniques including transfer, culture, isolation and identification techniques, growth rates and antibiotic sensitivity.

Course Content:

The topics in the course include the following:

- 1.

7. CLINICAL MICROBIOLOGY
  - 7.1. Epidemiology and public health
  - 7.2. Emergent diseases
  - 7.3. Transmission of disease
  - 7.4. Nosocomial infections
  - 7.5. Specific body system diseases
  
8. LABORATORY TOPICS
  - 8.1. Basic Techniques in Microbiology
    - 8.1.1. Laboratory operations and safety
    - 8.1.2. Laboratory reporting techniques
    - 8.1.3. Microscopy
  
  - 8.2. Bacteria: Transfer, culture and isolation techniques
    - 8.2.1. Aseptic techniques
      - 8.2.1.1. Preparation of media and plates
      - 8.2.1.2. Tube transfers
      - 8.2.1.3. Streak plate and spread plate techniques
  
  - 8.3. Colony and Cellular Morphology
    - 8.3.1. Agar plate colonial characteristic and agar slant growth
    - 8.3.2. Individual cell characteristics (coccus, bacillus and spirillum microscopic recognition)
  
  - 8.4. Differential Staining
    - 8.4.1. Negative staining
    - 8.4.2. Gram stain
    - 8.4.3. Acid fast staining
  
  - 8.5. Bacterial Growth
    - 8.5.1. Serial dilution
    - 8.5.2. Growth rate determination (direct/plate counts)
  
  - 8.6. Bacterial Sensitivity and Resistance
    - 8.6.1. Examination of bacterial sensitivity to a variety of antibiotics
    - 8.6.2. Plating and isolation of antibiotic resistant bacteria
  
  - 8.7. Antibody-Antigen reactions
    - 8.7.1. Agglutination reactions
    - 8.7.2. Immunoprecipitation in agar plates
  
  - 8.8. Practical Case Study
    - 8.8.1. Characterization and identification of a microorganism using the techniques learned throughout the laboratories, as well as the information given in the theory lectures.

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**Q:** Means of Assessment

Class tests and assignments	25
Laboratory	25
Exams	
- Term exam(s)	20
- Final exam	