

COURSE SYLLABUS

LAST REVIEW	Spring 2021
COURSE TITLE	Microbiology
COURSE NUMBER	BIOL-0261
DIVISION	Math, Science, Business & Technology
DEPARTMENT	Biology
CIP CODE	24.0101
CREDIT HOURS	3
CONTACT HOURS/WEEK	Class: 3
PREREQUISITES	CHEM0109, General Chemistry and Lab, or CHEM0111, College Chemistry I and Lab, or BIOL0121 General Biology or BIOL-0135 Cell and Molecular Biology; or BIOL0271 Physiology.
COURSE PLACEMENT	Students must meet the correct placement measure for this course. Information may be found at: https://www.kckcc.edu/admissions/information/mandatory-evaluation-placement.html

COURSE DESCRIPTION

Microbiology is a basic inquiry into the significance of microbes in our environment, featuring sustainability issues, with emphasis on pathogenesis in humans. Students will investigate the cell structure of bacteria, the chemical nature of viruses, and the genetic flow of information within and between microbes. They will discover how infectious diseases are developed and transmitted and how the human immune system is designed to protect us from disease.

TEXTBOOKS

<http://kckccbookstore.com/>

METHODS OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. Microbes in Our Lives
 - A. History of Microbiology
 - B. Taxonomy - Biological Evolution
 - C. Microbes and the Environment - Sustainability
- II. Chemical Principles
 - A. Functions and Locations of Biological Molecules
 - B. Hierarchy of Organization in Living Things
 - 1. Atoms, molecules, macromolecules
 - 2. Cell macro-structures, and organelles
 - 3. Cells, tissues, organism
- III. Morphology of Prokaryotic Cells
 - A. Simple and Arrangement Morphology
 - B. Bacterial Cell macro-structures
 - 1. Cell Wall - peptidoglycan
 - 2. Capsule
 - 3. Flagella
 - 4. Plasma Membrane – phospholipids
 - 5. Cytoplasm
 - 6. Nucleic Acids - plasmids
 - 7. Ribosomes
 - 8. Endospores
- IV. Microbial Growth and Control
 - A. Physical and Chemical Growth Requirements
 - B. Physical and Chemical Control of Microbes
 - C. Antimicrobics (Pharmacology)
- V. Microbial Genetics – binary fission
 - A. Structure and Function of DNA and RNA
 - B. DNA Replication, Transcription, and Translation
 - C. Bacterial Methods for Creating Genetic Diversity
 - 1. Mutations
 - 2. Transformation
 - 3. Conjugation
 - 4. Transduction
- VI. Viruses
 - A. General Properties and Characteristics
 - B. Mechanisms of Pathogenesis
- VII. General Principles of Infectious Disease
 - A. Symbiotic Relationships
 - B. Modes of Disease Transmission
 - C. Nosocomial Infections
 - D. Epidemiology
- VIII. Bacterial Mechanisms of Pathogenesis
 - A. Exoenzymes

- B. Exotoxins
- C. Endotoxin
- IX. Immunology
 - A. The Lymphatic System
 - B. Nonspecific Host Immunity
 - 1. Skin
 - 2. Phagocytosis
 - 3. Inflammation
 - 4. Interferon
 - C. Specific Host Immunity
 - 1. Naturally Acquired Active Immunity
 - a. Humoral Immunity
 - b. Cell-Mediated Immunity
 - 2. Naturally Acquired Passive Immunity
 - 3. Artificially Acquired Active Immunity
 - 4. Artificially Acquired Passive Immunity
- X. Disorders of the Immune System
 - A. Immediate Type Hypersensitivity
 - B. Cytotoxic Type Hypersensitivity
 - C. Immune Complex Type Hypersensitivity
 - D. Delayed Type Hypersensitivity
 - E. Autoimmunity
 - F. AIDS

COURSE LEARNING OUTCOMES

Upon successful completion of this course, the student will:

- A. Be able to explain how microbes sustain life on our planet.
- B. Be able to summarize the function and location of basic molecules.
- C. Be able to identify and define macro-structures in bacterial cells.
- D. Be able to identify methods for controlling the growth of bacteria.
- E. Be able to define the natural mechanisms for microbial diversity.
- F. Be able to distinguish properties of and diseases induced by viruses.
- G. Be able to identify principles favoring infectious disease outbreaks.
- H. Be able to identify mechanisms of pathogenesis in bacteria.
- I. Be able to summarize principle components of the immune system.

J. Be able to identify four types of immunological disorders.

ASSESSMENT OF COURSE LEARNING OUTCOMES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.