

COURSE OUTLINE

BIOL-200

Microbiology

4 Credits

Science Core Course

HOWARD COMMUNITY COLLEGE

Description

Biology 200 is a course designed primarily for pre-medical professionals and for students planning to major in biological sciences in a four-year institution. The study of microbiology will enable the student to understand the biology of bacteria, algae, fungi, protozoa and viruses in terms of morphology, classification, reproduction, metabolism, genetics, population growth, environmental effects on growth and disease production. In addition, the student will study basic principles of water pollution, and inhibition and killing of microorganisms. In the laboratory, the student will gain experience with the tools and techniques used in the study of microorganisms. Prerequisite: BIOL-101 and 4 credits of chemistry. (3 hours lecture, 3 hours lab)

Statement on General Education and Liberal Learning

A liberal education prepares students to lead ethical, productive, and creative lives and to understand how the pursuit of lifelong learning and critical thinking fosters good citizenship. General education courses form the core of a liberal education within the higher education curriculum and provide a coherent intellectual experience for all students by introducing the fundamental concepts and methods of inquiry in the areas of mathematics, the physical and natural sciences, the social sciences, the arts and the humanities, and composition. This course is part of the general education core experience at Howard Community College.

Overall Course Objectives

Upon completion of this course, the student will be able to:

1. Identify the early microbiologists and their significant contribution to today's understanding of microorganisms.
2. Identify the major aspects of microscopy and types of microscopes.
3. Describe the functional anatomy of eukaryotic and prokaryotic cells.
4. Identify the major features of cellular metabolism in various microorganisms.
5. Identify the major factors that influence microbial growth.
6. Identify the major methods for controlling microbial growth and their mechanisms.
7. Identify the major features of microbial genetics and microbial genetic engineering.
8. Explain the classification and identification schemes for microorganisms.
9. Describe the major characteristics, physiology and life cycles of fungi, algae, protozoa and viruses.
10. Explain the major principles of disease, epidemiology and pathogenicity.
11. Explain the use of various serological laboratory tests.
12. Describe the features of several important infectious diseases.
13. Apply all of the above to problem-solving situations.

Major Topics

- I. History of Microbiology
- II. The Microbial World
- III. Microscopy of Microorganisms
- IV. Functional Anatomy of Prokaryotic and Eukaryotic Cells
- V. Microbial Metabolism
- VI. Microbial Growth
- VII. Control of Microbial Growth
- VIII. Microbial Genetics
- IX. Biotechnology and Recombinant DNA
- X. Classification of Microorganisms
- XI. Bacteria and Archaea
- XII. Fungi, Protozoa, and Algae
- XIII. Viruses
- XIV. Principles of Disease and Epidemiology
- XV. Microbial Mechanisms of Pathogenicity
- XVI. The Immune Response
- XVII. Practical Applications of Immunology
- XVIII. Antimicrobial Drugs
- XIX. Environmental Microbiology
- XX. Applied and Industrial Microbiology
- XXI. Microbial Diseases

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but will be calculated on the basis of exams, lab practicals and a lab book.

Other Course Information

This course is a Science core course, a Science elective and an Arts and Sciences elective.