COURSE OUTLINE

BIOL-101

General Biology I

4 Credits

Science Core Course

HOWARD COMMUNITY COLLEGE

Description

Following successful completion of Biology 101, the student will be able to describe the characteristics of living things at all levels of organization—from the atomic through the molecular, cellular, and organismal levels. The study of human genetics, development, and anatomy and physiology will enable the student to relate the chemical activities of the cell to the overall function of man. Prerequisite: ENGL-096 or ENGL-086. (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 and describe the distinguishing characteristics of living things.
2. Apply the scientific method to real and simulated problem-solving situations.
3. Describe the basic structure and function of atoms, and types of chemical bonds.
4. Identify the structure and properties of water including a consideration of pH and its significance.
5. Describe the principal categories of organic molecules, their structure and biological function.
6. Describe the process of digestion.
7. Identify the basic sub-cellular structures and their functions.
8. Classify biological specimens according to the five kingdom classification scheme.
9. Explain the basic principles of bioenergetics, including the processes of photosynthesis and respiration.
10. Explain the processes of mitosis and meiosis and their significance.

11. Describe examples of human genetic and chromosomal abnormalities.

12. Identify the structure and function of DNA, including the processes of replication, transcription, translation and mutagenesis.

13. Describe the basic techniques involved in genetic engineering and identify present and future applications of this technology.

14. Apply all of the above to problem-solving situations.

Major Topics

I. Introduction to Living Things
II. Scientific Method
III. Atoms and Bondings
IV. Water and pH
V. Organic Molecules
VI. Digestion
VII. Kingdom Classification
VIII. Cell Structure and Function
IX. Cell Membranes
X. Bioenergetics
XI. Photosynthesis
XII. Cellular Respiration
XIII. Cell Division
XIV. Principles of Inheritance
XV. Chromosomes and Genes
XVI. DNA History
XVII. DNA Structure and Replication
XVIII. Protein Synthesis
XIX. Genetic Engineering

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but will include the following:

Final grades will be calculated on the basis of exams, quizzes, written assignments, lab practical and lab reports.

Other Course Information

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