Revised 8/2022

NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
BIO 205 – GENERAL MICROBIOLOGY (4 CR.)

Course Description

Explores the structure and function of microorganisms and their relationship to the environment and humans. Emphasizes the various groups of microorganisms, their growth and metabolism, roles in the functioning of ecosystems, genetics, their roles in human health, the use of microbes in industrial applications and biotechnology and methods of microbial control. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.

General Course Purpose

This course will enable biology majors to build a solid and broad foundation in their understanding of the biology of microorganisms and their roles in ecosystems, human health, and biotechnology applications. The course includes lecture and hands-on laboratory components. Both components will emphasize giving students a firm understanding of the importance of microorganisms and the techniques used to study them.

Course Prerequisites/Corequisites

Prerequisites: BIO 101, BIO 102, CHM 111, ENG 111. Corequisite: CHM 112.

Course Objectives

Upon completing the course, the student will be able to:

Core Competencies
Scientific Literacy

- Develop and test scientific hypotheses.
- Collect and analyze empirical scientific data.
- Explain the implications of scientific concepts in society.
- Communicate scientific ideas, research, and experimental findings in writing.

Characteristics of Living Organisms: Cellular biochemistry, cell structure and function, and bioenergetics

- List the characteristics of living organisms
- Explain the importance of cells and cell theory
- Describe the structure and function of cells
- Identify the role of bioenergetics and cellular metabolism in living organisms

Cellular and Organismal Reproduction: Cell division, genetics and inheritance, biotechnology

- Explain the steps involved in cell division
- Compare and contrast the processes of mitosis and meiosis
- Describe patterns of genetic inheritance
- Research current reproduction and genetics topics in science

Evolution and Ecology: Patterns and evidence of evolution, population and ecosystem ecology

- Explain the process of evolution by natural selection
- Describe the evidence supporting the theory of evolution
- Identify the basic principles of ecology
- Relate the basic principles of ecology to the diversity and distribution of organisms on earth

Major Topics to be Included

- Characteristics of Living Organisms: Cellular biochemistry, cell structure and function, and bioenergetics
- Cellular and Organismal Reproduction: Cell division, genetics and inheritance, biotechnology
- Evolution and Ecology: Patterns and evidence of evolution, population and ecosystem ecology