BIOL 2060

Division: Natural Science and Mathematics
Department: Biology
Course: BIOL 2060
Title: Introductory Microbiology
Catalog Description:

Introductory microbiology surveys the fundamental biological processes observed in bacteria and microorganisms with emphasis placed on their beneficial and harmful activities related to humans and other organisms. Molecular genetics and biotechnology are introduced. It must be taken concurrently with BIOL 2065.

General Education Requirements: Life Science
Semesters Offered: Fall, Spring, Summer
Credit/Time Requirement: Credit: 3; Lecture: 3; Lab: 0
Clock/Hour Requirements: 0
Offered for Non-Credit: No
Prerequisites: A strong background in chemistry or biology is recommended.

Corequisites: BIOL 2060 must be taken concurrently with the Laboratory BIOL 2065.

Justification:

This course is an introductory microbiology course designed to make students aware of the ubiquitous character of microorganisms and their beneficial and harmful activities related to humans and other life forms. It will fulfill the Biology General Education (GE) requirement. Many nursing and health care programs require a basic or introductory microbiology course as a prerequisite.

Student Learning Outcomes:

Students will know basic biological principles using microorganisms as models.
Students will know the processes by which microorganisms function either as beneficial or harmful agents to either humans or other life forms.

Students will be aware of the importance of personal hygiene, proper food handling, waste treatment and disposal, water treatment, immunization, and other health-preserving practices in maintaining their personal well-being.

Students will be allowed to investigate the role of microorganisms in molecular biology and genetic engineering and appreciate the advances of biological and medical sciences.

Content:

Brief History of microbiology and the scientific method
Principles of microscopy

Biological diversity of life with particular emphasis on microorganisms

Cell chemistry and metabolism

Nutrition and cultivation of microorganisms

Microbial growth and control

Environmental microbiology

Microbiology of water and wastewater

Food microbiology

Agriculture microbiology

Industrial microbiology

Public health microbiology

Microbial ecology

Infectious diseases (bacterial, fungal, protozoal, and viral diseases)

Immunology

Principles of microbial genetics, molecular biology and genetic engineering

Evolution of microorganisms and speciation.

General Education Outcomes:

1) Read effectively, constructively, and critically.
Students read the text throughout the course, library, internet sources, and primary literature in their poster/research project. The project and test essay questions are evaluated on synthesis and critical thinking processes.

2) Write clearly, informatively, and persuasively.
Students will complete at least one poster/research project and several test essay questions over the course of the semester that will be evaluated for skills in writing as well as in the areas of synthesis and critical thinking.

4) Retrieve, evaluate, interpret, and deliver information through a variety of traditional and electronic media.
Students will complete at least one poster/research project that requires student to research information from many sources for presentation in the traditional poster format.

7) Apply scientific reasoning to a variety of contexts.

Students will demonstrate scientific reasoning throughout the various topics considered in course content and their responses to tests, quizzes, projects, discussions, and case studies.

Key Performance Indicators:

Outcomes will be assessed by midterm exams (65-70%) quizzes (0-10%), case studies (0-10%), poster/research project (10-15%), worksheets/assignments (0-10%) and a comprehensive final exam (15-20%). Because several instructors teach microbiology, percent ranges are listed for each assessment method.

Representative Text and/or Supplies:

One of the following texts or a comparable text will be used.
Jacquelyn G. Black, John Wiley and Sons, Inc. Microbiology: Principles and Explorations, current edition.

Nester, Anderson, Roberts, Pearsall, and Nester. WCB/McGraw-Hill Publishers. Microbiology: A Human Perspective, current edition.

Optimum Class Size: 24
Maximum Class Size: 48

Signatures:

I hereby submit this course syllabus:

Allan Stevens, , Professor

I hereby find this course consistent with the goals and resources of the Biology Department:

Allan Stevens, , Professor, Chair

I hereby find this course consistent with the goals and resources of the Natural Science and Mathematics Division:

Dan Black, EdD, Associate Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

Michelle Olsen, MLS, Campus Librarian (Richfield Campus)