



**Course Name:** Microbiology

**Course Number:** BIO E\*235

**Credits:** 4

**Catalog description:** The fundamentals of microbiology and a survey of microbial life. The bacteria are studied as characteristic prototypes of all microorganisms. These and other microorganisms are discussed, stressing their environment, growth, reproduction, metabolism, control of growth and relationship to humans. 3 hours of lecture, 3 hours of laboratory.

**Prerequisite:** Eng\*E101, CHE\*E111 or CHE\*E121, and BIO\*E105 or BIO\*E121, each with a grade of “C” or higher.

## **General Education Competencies Satisfied:**

**HCC General Education Requirement Designated Competency Attribute Code(s):**

SCKX                      **Scientific Knowledge & Understanding**

**Additional CSCU General Education Requirements for CSCU Transfer Degree Programs:**

SCRX                      **Scientific Reasoning**

**Embedded Competency(ies):**

None

**Discipline-Specific Attribute Code(s):**

SCI                      **Science elective**

## **Course objectives:**

### **General Education Goals and Outcomes:**

**Scientific Knowledge & Understanding:** Students will gain a broad base of scientific knowledge and methodologies in the natural sciences. This will enable them to develop scientific literacy, the knowledge and understanding of scientific concepts and processes essential for personal decision making and understanding scientific issues.

**Scientific Reasoning (for CSCU Transfer Degree Programs):** Students will become familiar with science as a method of inquiry. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions.



**Course Specific Objectives:**

**GENERAL EDUCATION:**

- 1.3 Demonstrate knowledge of the sciences and their methods.
- 2.1 State a problem clearly.
- 2.3 Analyze and organize facts and ideas.
- 2.4 Draw reasonable inferences from facts and ideas.
- 3.2 Receive and comprehend written and oral information.
- 5.1 Recognize ethical issues, both personal and public.
- 6.2 Interpret numerical information as presented in charts and graphs.

**OTHER:**

1. Demonstrate skills in the laboratory in those techniques most commonly used in standard and medical microbiology.
2. Demonstrate an understanding of basic biological processes common to all forms of life, and those unique to microbial life.
3. Demonstrate an awareness of the basic biochemical unity among all living organisms, and what constitutes “life” versus non-living infectious agents.
4. Recognize the relationship of microbes to human lives and their role in human health and disease.
5. Apply acquired knowledge and skills to culture, isolate, perform biological and chemical tests, analyze data collected, and ultimately identify unknown bacteria.
6. Explain how germ theory, epidemiology, public health policy, health care practice and food safety recommendations have evolved in response to increasing knowledge of the microbial world and its impact on human health.
7. Explain how classical microbiological isolation and identification methods are being replaced by molecular and genetic methods of analysis; compare the pros and cons of each system.

**Course Content:**

**Lecture**

History and Development of Microbiology

Classification of Microbes

Microscopy and Staining



Prokaryotic and Eukaryotic Cells  
Microbial Growth, Reproduction, Culture  
Microbial Metabolism  
Microbial Genetics  
Biotechnology  
Control of Microbial Growth  
Disease and Epidemiology  
Immunology  
Mechanisms of Pathogenicity  
Antimicrobial Drugs  
Human Diseases  
Bacteria  
Fungi  
Protozoa  
Helminths  
Viruses

### **Laboratory**

Safety  
Microscopy  
Ubiquity of Microbes  
Wet Mount Preparation  
Aseptic Transfer  
Smear Preparation  
Gram Stain/Acid-Fast Stain  
Streaking for Isolation  
Selective and Differential Media  
Anaerobic Culture  
Carbohydrate Fermentation  
Sulfide/TSI/Urease  
Antibiotic Sensitivity Testing  
Biochemical Identification of Human Pathogen  
Serological Identification of Human Pathogens  
Rapid Bacterial ID systems  
Yeasts/Molds  
Protozoans  
Helminths



ELISA/Electrophoresis Techniques

Date Course Created: 1966

Date of Last Revision: 02/27/2017