

**Common Course Number:** MCB-2013

**Course Title:** Microbiology

**Catalog Course Description:**

The identification, morphology and physiology of bacteria, algae, protozoa, rickettsiae, and viruses, with emphasis on the effects of their activities upon human affairs. Microbiology is an introduction to microbiology emphasizing principles of basic morphology, physiology, modes of transmission, biochemistry, and genetic mechanisms. It includes a survey of representative types of microorganisms and the role of pathogenic organisms in health and disease.

**Credit Hours Breakdown:** 3 lecture hours

**Prerequisite:** BSC-2085, BSC-2085-L, CHM-1033, CHM-1033-L

**Co requisite:** : MCB-2013 Laboratory

**Course Competencies:**

**Competency 1:** Microscopic Examinations and Bacterial Classification

Upon successful completion of this laboratory, the student will be able to describe the history of microbiology, describe techniques for examining and classifying microorganisms into their appropriate taxonomic categories by:

1.1 List and explain the important discoveries made by Leeuwenhoek, Koch, Pasteur, and others to the development of microbiology. Differentiate between eukaryotic and prokaryotic cells.

1.2 Discuss the cell theory, germ theory, and concept of spontaneous generation. List and explain the functions all cells must perform.

1.3 Discuss the use of the principles of taxonomy in classifying various types of microorganisms.

1.6 Categorize various life forms into the appropriate

kingdoms.

1.7 List the similarities and differences of each of the following microbes: bacteria, protozoa, fungi, algae, and viruses.

1.8 List several ways in which microorganisms can contribute to solving some important human problems in the future.

1.9 Explain the function of each part of the microscope.

1.10 Explain magnification, resolution, and the path of light through a microscope.

1.11 Compare and contrast the various light microscopes with the various electron microscopes.

1.12 Explain how simple staining procedures differ from differential staining methods.

1.13 List the steps in the Gram and acid-fast stains, the functions and principles involved in each step, and diagnostic values of each procedure.

1.14 Define the concept "species." Compare the concept of species as applied to bacteria with its application to higher organisms.

1.15 Describe recent developments in the methods of classification such as the comparison of DNA bases and amino acid composition.

\*1.16 Explain the differences between ionic, covalent and hydrogen bonding with examples of each.

\*1.17 Explain the importance of pH and buffer systems as they relate to microorganisms.

\*1.18 Describe the four classes of organic compounds: carbohydrates, lipids, proteins and nucleic acids.