

## BIO 239: Elements of Microbiology

This course considers the general and medical aspects of microorganisms and discusses methods of identification, sources and modes of infection, inhibition and control of growth, and principles of sanitation. This course includes a study of bacterial physiology and genetic engineering. The laboratory component studies basic techniques.

Prerequisites: BIO 233, or BIO 154, or BIO 121, each with a C or better. Three class hours and three laboratory hours per week. Instructional Support Fee applies. Gen. Ed. Competencies Met: Scientific Reasoning and Discovery.

### Course Student Learning Outcomes

1. Summarize the major physical, chemical and physiological characteristics of microorganisms as a whole and explain their roles in geochemical cycles, as members of the normal human microbiota and as causative agents of infection and disease.
2. Compare the major groups of microorganisms with respect to the unique physical properties of each group and the unique requirements of each group with respect to nutrition, growth and reproduction.
3. Summarize the major physical and chemical means of controlling microbial growth, comparing and including an analysis of the roles of antiseptics and disinfectants, and that of antibiotics.
4. Demonstrate the ability to carry out standard bacteriological techniques, and to utilize that knowledge to separate mixed cultures of bacteria, and to identify specific bacteria in those cultures from the results of standard microbiological tests.
5. Explain the relationship between microorganisms and infectious disease, and describe some of the methods for slowing or preventing the spread of disease from one individual to another.
6. Summarize the functions of the human immune system with regard to warding off infectious disease; compare and contrast the roles of proper sanitation, immunization and community planning in preventing and controlling the spread of infectious diseases.
7. Explain the role of Microbial Genetics, Genetic Engineering and Recombinant DNA in our modern world.

**Credits:** 4

**Program:** Biology