

# Northwest Arkansas Community College

(Science and Mathematics Division)

**Discipline Code**

MBIO

**Course Number**

2014

**Course Title**

General Microbiology

**Catalog Description**

Survey of microorganisms, their role in the ecosystem, their impact on and use by man. The basic structure, growth and metabolism of bacteria and viruses will be examined. Immunological principles and their application to microbiology will also be presented. Emphasis in laboratory on sterile technique and culturing microorganisms on various diagnostic media. Three hours lecture and three hours lab weekly.

**Prerequisites**

Anatomy & Physiology I (BIOL 2214) with a grade of "C" or better, or either Intro to Anatomy & Physiology (BIOL 1013) or Principles of Biology I (BIOL 1544) AND Fundamentals of Chemistry (CHEM 1074) with grades of "C" or better, or permission of the chair or coordinator.

**Credit Hours**

4 credit hours

**Contact hours**

45 lecture contact hours; 45 lab contact hours

**Load hours**

5 load hours

**Semesters Offered**

Fall, Spring & Summer

**ACTS Equivalent**

BIOL2004 Introductory Microbiology

**Grade Mode**

A-F

**Learning Outcomes**

Overall students completing this course will:

- Define terms, explain principles, and describe processes of microbiological topics pertinent to professional application and further study.

- Recognize and employ scientific thinking to the understanding of microorganisms.
- Identify the impact of microbes on life at the individual, societal, and ecological levels.
- Demonstrate basic microbial laboratory skills, perform lab experiments, and interpret results.
- Develop information literacy skills.

## **General Education Outcomes Supported**

- Students develop higher order thinking skills
- Students demonstrate information literacy.

## **Standard Practices**

Topics:

- Brief history and scope of microbiology
- Review chemical concepts
- Cell structure and function
- Metabolic pathways and growth
- Information flow, genetics and evolution
- Control of growth (asepsis, sterilization, disinfection, food safety, antimicrobial drugs)
- Microbial diversity (basic classification, characteristics and behavior)
- Impact of microorganisms and microbial systems
  - Human host-microbe interactions that result in infection
  - Epidemiology & principles of infection transmission
  - Microbial roles in the environment and agriculture
  - Human use of microbes and their products
- Laboratory skills
  - Lab safety & aseptic technique
  - Use of the microscope & staining
  - Inoculation, enrichment, incubation
  - Population estimates
  - Isolation (steak dilution, selective & differential media)
  - Identification methods using morphology and metabolism
  - Document and report on experimental protocols, results and conclusions

## **Learning activities**

- Courses must, at a minimum, cover the core learning outcomes for each topic.
- Laboratory exercises include use of microscope, preparation of stains and general laboratory techniques, including but not limited to aseptic technique, streak plate, and identification methods.

## **Assessments**

Minimum requirements:

- Written exams that include higher order thinking questions
- Lab notebooks/write-ups
- Summary or interpretation of at least one scientific article
- Literature research paper or presentation
- Comprehensive assessment questions that will be used for course assessment.

## **Grading guidelines**

- A minimum of 70% of the grade must be proctored, supervised, or otherwise verified.

- Approximately 25% of the grade must come from lab work since the lab and lecture credits for this course are combined.

**Revision Date**

April 22, 2021

## **MBIO 2014 Microbiology**

### **Degrees affected:**

AA

AA – CAST

AA – Global Studies

AS – LAS

AS – LAS Art History

AS – LAS Business Education (UA, Fayetteville)

AS – LAS Child Advocacy Studies

AS – LAS Family & Consumer Science Education

AS – LAS Global Studies

AS – LAS Pre-Engineering General Transfer

AS – LAS Pre-Engineering UA Transfer

AS – LAS Secondary Education Social Sciences (UA, Fayetteville)

AS – LAS Visual Art

AS – AFLS

AAS – Environmental Regulatory Science Environmental Management

AAS – Environmental Regulatory Science Safety, Health & Hazardous Materials Management

AAS – Health Science