

**University of Arkansas – Fort Smith 5210
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General Syllabus

BIOL 10031 Biological Science Laboratory

Credit Hours: 1

Lecture Hours: 0 Prerequisite Laboratory Hours: 2

Corequisite: BIOL 10043 Biological Science

Effective Catalog: 2018- 2019

I. Course Information

A. Catalog Description

Complements BIOL 10043; laboratory exercises are integrated with lecture topics and stress scientific methodology and thinking. Participation in animal dissections may be required.

B. Additional Information

A study of the general principles of biology and their relationship to society. The focus is on natural laws, maintenance of living systems and the interrelationship among living systems, and the biosphere. Topics include ecology, genetics, evolution, the diversity and unity of life, molecular and cellular biology.

Dissection of preserved animals or parts of animals may be a required part of this course.

II. Student Learning Outcomes

A. Subject Matter

Upon completion of this course, the student should be able to:

1. Discuss the influences of science on societal structures and attitudes, and the ways society affects scientific thinking and the emphasis of scientific investigation.
2. Describe the biosphere, its structure and maintenance, and the ways in which human activities affect it and the individual's response to it.
3. Describe the science of genetics and of evolutionary theory, explain the fundamental principles of inheritance, and discuss organic evolution in terms of these principles.
4. Explain the theories of the origin of life and the evidence that supports evolution theory.

5. Describe the systems by which living organisms are classified.
6. Describe, in molecular terms, the major biological chemical groups, the uses of these substances in cellular synthesis and energy production, the molecular nature of genes, and how evolution occurs at the molecular level.
7. Describe the structures of the major organ systems of animals and their contribution to the maintenance of homeostasis with particular reference to human anatomy and physiology.

B. University Learning Outcomes

Biological Science enhances student abilities in the following areas:

Analytical Skills

Critical Thinking Skills: Students will analyze and draw appropriate conclusion to “real-life” biology situations. Students will analyze gathered data using statistical and mathematical principles.

Communication Skills (written and oral)

Students will effectively communicate scientific ideas and principles. Students will compose scientifically sound lab reports and present facts to peers using correct terminology.

III. Major Course Topics

- A. Introduction to Biology
 1. Laboratory safety
 2. The metric system
 3. The scientific method
- B. The Microscope
 1. Use of compound and dissecting microscopes
- C. Cells
 1. The major organelles of eukaryotic cells
 2. Microscopic examination of plant and animal cells
- D. Cell Membranes
 1. Diffusion
 2. Osmosis
- E. Enzymes
 1. Basics of enzyme function
- F. Cell Division
 1. Binary Fission
 2. Mitosis
 3. Meiosis
- G. Genetics and Heredity
 1. Connecting meiosis and genetics
 2. Basic Mendelian patterns of inheritance
- H. Molecular Genetics
 1. Isolation of DNA