

University of Arkansas – Fort Smith
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General Syllabus

BIOL 10043 Biological Science

Credit Hours: 3

Lecture Hours: 3

Laboratory Hours: 0

Effective Catalog: 2018- 2019

I. Course Information

A. Catalog Description

General principles of biology and their relationship to society. A scientific focus is used to examine the 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. (ACTS: BIOL 1004; must complete BIOL 10043/10031)

B. Additional Information

This course along with BIOL 10031 is intended to satisfy four credit hours of the lab science requirement of UAFS's general education core, and is intended to be transferable to other colleges and universities. Although there is no specific prerequisite, it is assumed that the student will have successfully completed at least one high school level course in biology. This course builds on that foundation.

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 general education areas:

Analytical Skills

Critical Thinking Skills: Students will analyze and draw appropriate conclusion to “real-life” biology situations.

Communication Skills (written and oral)

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

Ethical Decision Making

Students will use science as the basis for making informed decisions on controversial issues faced by the society in adherence to their values.

III. Major Course Topics

- A. Introduction to Biology
 1. The properties of life
 2. Evolution and natural selection
 3. The scientific method
 4. Scientific theories
 5. Domains and kingdoms of life
 6. Levels of biological organization
- B. Chemistry of Biology
 1. Elements, compounds, atoms, and bonding
 2. Chemistry of water
- C. Molecules of Biology
 1. Organic compounds
 2. Large biological molecules: Carbohydrates, Lipids, proteins, and nucleic acids
- D. The cell
 1. Membrane structure
 2. Organelles and their functions
- E. Cellular energetics
 1. Photosynthesis
 2. Cellular respiration
- F. Cellular reproduction
 1. Mitosis

- 2. Meiosis
- G. Basic Mendelian inheritance
 - 1. Mendel's laws
 - 2. Monohybrid crosses
- H. Biological Diversity
 - 1. Domains and eukaryotic kingdoms
- I. Ecology
 - 1. Communities and Ecosystems
 - 2. Biomes