

University of Arkansas - Fort Smith
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General Syllabus

BIOL 101H3 Biological Science (Honors)

Credit Hours: 4

Lecture Hours: 3

Laboratory Hours: 2

Prerequisite: Acceptance into the Miles Friedman Honors program.

Effective Catalog: 2018- 2019

I. Course Information

A. Catalog Description

Students acquire a broad understanding of biological and ecological principles and the methods of science, which help them make personal and social decisions involving biology. Content includes scientific methodology, organisms and ecology, evolution and genetics, the origin and diversity of life, cell organization and energetics, and the organ systems of higher animals.

B. Additional Description

This section of biological science differs from the regular sections primarily in that it provides for more interaction between students, for more collaboration in the laboratory, and for more extensive and more investigative laboratory exercises, including field exercises.

II. Student Learning Outcomes

A. Subject Matter

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

1. Discuss the interactions between biology and society, and make informed, logical, personal decisions about matters that involve biology.
2. Having experienced science as a process, comprehend scientific methodology by theory and practice and understand science as a way of knowing.
3. Describe the biosphere, its structure and maintenance, and the ways in which human activities affect it and the individual's response to it.
4. Discuss basic biological concepts at the cellular level: describe cell diversity, cell organization, and basic cellular processes.
5. Describe the science of genetics and evolutionary theory and the fundamental principles of inheritance, and discuss organic evolution in light of these concepts.

6. Demonstrate appreciation for global biodiversity, explain how organisms are classified, and discuss in general terms the major plant and animal taxa.
7. Describe the forms and functions of the major organ systems of higher animals, with particular reference to human anatomy and physiology.

B. University Learning Outcomes-

This course enhances student abilities in the following areas:

Global and Cultural Perspectives

Students will reflect upon diversity in the classroom and their implications for interacting with all cultures and abilities. Students will demonstrate the application of biology education in a global environment.

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