

University of Arkansas – Fort Smith
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General Syllabus:

BIOL 3401 Ecology Laboratory

Credit Hours: 1

Lecture Hours: 0

Laboratory Hours: 3

Prerequisite or corequisite: BIOL 3403 Ecology

Effective Catalog: 2018- 2019

I. Course Information

A. Catalog Description

Field and lab exercises on a variety of topics dealing with distribution and abundance of organisms, and with the interactions among organisms and their environment.

II. Student Learning Outcomes

A. Subject Matter

Upon completion of this course, students will be able to:

1. Design and set up field or lab experiments to address questions regarding organisms and their interactions with the environment.
2. Be able to use statistical and mathematical tools to analyze and interpret quantitative data.
3. Write reports presenting their findings in the context of published information.
4. Defend and make succinct oral presentations to convey their findings to scientific and popular audiences.

B. University Learning Outcomes

Analytical Skills

Critical Thinking Skills: Students will use critical thinking skills to identify problems relevant to the environment and develop solutions.

Communication Skills (written and oral)

Students will effectively communicate scientific ideas and principles. Students will compose scientifically sound lab reports and communicate their research findings in a public or departmental setting.

Ethical Decision Making

Students will use science as the basis for making informed decisions on controversial ecological issues faced by the society.

III. Major Course Topics

- A. Various methods of sampling organisms, especially fish, insects and other macroinvertebrates
 - 1. Kick nets sampling
 - 2. Arthropod sweeping nets sampling by Removal Sweep Method
 - 3. Seining for fish
- B. Vegetation sampling and quantifying forest composition
 - 1. Quadrat sampling
 - 2. Random Pairs sampling
- C. Ecological niches: quantification and analyses
 - 1. Avian foraging niche quantification
 - 2. Fundamental vs. Realized Niche
- D. Inter- and Intraspecific interactions among organisms
 - 1. Animal or plant dispersion patterns
- E. Nature and dynamics of communities and ecosystems: species diversity, food webs, energy production and flow, and nutrient cycling.
 - 1. Shannon-Weiner Species Diversity Index
 - 2. Leaf decomposition in aquatic environments
- F. Basic methods in literature reviews, data collection and statistical analysis.
- G. Making effective oral and written presentations of findings