

University of Arkansas – Fort Smith
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General Syllabus:

BIOL 3603 Vertebrate Zoology

Credit Hours: 3

Lecture Hours: 3

Laboratory Hours: 0

Prerequisite: BIOL 2703/2701 General Zoology/Laboratory

Effective Catalog: 2018- 2019

I. Course Information

A. Catalog Description

Provides a broad and basic background of the biology of vertebrate animals and explains how vertebrates function, evolve, and interact with each other. The course includes a comparative overview of the origins, phylogeny, and major morphological and physiological adaptations of fishes, amphibians, reptiles, birds, and mammals. Special emphasis is placed on regional forms.

B. Additional Information

This is a junior level elective course for biology majors and students interested in the biology of vertebrate animals. It builds upon the introductory information on vertebrate animals presented in the General Zoology courses (BIOL 2703 and BIOL 2701). Classroom use is made of the University's extensive collections of animal specimens such as bird and mammal study skins, skeletons, and preserved fishes, amphibians, and reptiles. Optional field trips to study local vertebrate populations may be available to students.

II. Student Learning Outcomes

A. Subject Matter

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

1. Distinguish the major groups of vertebrate animals.
2. Identify many of the common local forms.
3. Describe the phylogenetic relationships of the major vertebrate taxa.
4. Evaluate and discuss ecological factors influencing vertebrate distribution patterns.
5. Assess and describe the comparative differences and similarities of biological features among the five major vertebrate groups.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Quantitative Reasoning: Students will apply appropriate mathematical/statistical models to solve problems, and demonstrate an ability to read graphs and interpret the data.

Communication Skills (written and oral)

Students will communicate proficiently. They will write appropriately to the context of the course, identifying facts from opinions, and read and write primary literature in accepted scientific format. Students will effectively communicate orally in a public setting,

III. Major Course Topics

A. Vertebrate Ancestry

1. The earliest evidence of vertebrates
2. The environment of early vertebrate evolution
3. The transition from jawless to jawed vertebrates

B. Systematics

1. Major groups of vertebrates
2. Phylogeny of vertebrates

C. Vertebrate Zoogeography

1. Worldwide distribution of major vertebrate groups.
2. Local and regional distribution of major vertebrate groups

D. Fishes and Fishlike Vertebrates

1. The aquatic environment
2. Extant jawless fishes
3. Evolutionary specializations of Chondrichthyes
4. The extant Chondrichthyes
5. Extant Sarcopterygii – lobe-finned fishes
6. Extant Actinopterygii – ray-finned fishes

E. Amphibians

1. Origin and radiation of the tetrapods
2. Salamanders (Order Caudata or Urodela)
3. Frogs and toads (Order Anura)
4. Caecilians

F. Reptiles

1. Turtles
2. The Lepidosaurs: Tuatara, lizards, and snakes
3. Crocodylians
4. Mesozoic diapsids: dinosaurs, birds, and others

G. Birds

1. Origin of birds

2. Morphological adaptations for flight
3. Physiological adaptations for flight

H. Mammals

1. Mammalian ancestry
2. Features shared by all mammals
3. Major lineages of mammals

I. Comparative Morphological Adaptations

1. General patterns of form and function
2. Sensory systems
3. Feeding and digestion
4. Adaptations for living in water
5. Adaptations for living on land

J. Comparative Physiological Adaptations

1. Ectothermy
2. Endothermal thermoregulation
3. States of dormancy

K. Vertebrate Reproduction Patterns

1. Adaptations for aquatic reproduction
2. Adaptations for terrestrial reproduction
3. Social behavior and mating systems
4. Patterns of embryonic care
5. Patterns of parental care of offspring