C-ID Descriptor
Zoology / Animal Diversity and Evolution

Descriptor Details

- **Descriptor Title**: Zoology / Animal Diversity and Evolution
- **C-ID Number**: 150
- **Units**: 4.0
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General Description

This course is intended for majors, and includes a survey of animal phyla and non-photosynthetic, single-celled, eukaryotic taxa. It covers the comparative structure, function, and life cycles of animals, as well as principles of evolution, taxonomy, and systematics. Topics include development, morphology and physiology, phylogeny, and behavior of animals, as well as principles of evolution, mechanisms of evolutionary change, and speciation.

Prerequisites

Eligible for college-level math (C-ID MATH 110, 120, 130, 140, 150, 151 OR any other course with Intermediate Algebra as a prerequisite)

Corequisites

No information provided

Advisories

Completed Cell and Molecular Biology (C-ID BIOL 190); Eligible for English Composition (C-ID ENGL 100)

Content

Overview of tree of life and position of Animalia and non-photosynthetic, single-celled, eukaryotic taxa
Survey of animal phyla
Animal Systems Structure: Anatomy
Animal Systems Function: Physiology
Development and Life Cycles of representative animals and non-photosynthetic, single-celled, eukaryotic taxa
Animal Behavior
Phylogeny/Evolutionary History of Animal Taxa
Systematics and Taxonomy: Classification schemes
Study of how animal structures are related to their development, evolutionary origins, and modification.
Mechanisms of Evolutionary Change: Natural Selection, Genetic Drift, Gene Flow, Mutation, and Nonrandom Mating
Principles of Population Genetics
Speciation and Extinction

Lab Activities

The laboratory component must include greater than 80% hands-on activities that support the learning goals of the course. Laboratory content must be considered when matching courses to this descriptor.

Typical laboratory content includes:

Introduction to the scientific method and experimental design.
Use of investigative activities to explore course topics.
Microscopic examination, observation, or dissections of representative organisms from animal and non-photosynthetic, single-celled, eukaryotic taxa.
Comparative study of functional morphology, physiology, and behavior of representative organisms from major animal taxa.
Comparative study of developmental stages and life cycles of representative organisms from animal and non-photosynthetic, single-celled, eukaryotic taxa.
Exercises to illustrate how taxonomic classification schemes are established for animal and non-photosynthetic protist taxa.
Exercises to explore mechanisms of evolutionary change.

Typical laboratory activities may also include:

Simulations, exploratory activities in systematics, field observations, field sampling methods, field trips, case studies, projects, and presentations.

Objectives

At the conclusion of this course, the student should be able to:

1. Recognize characteristics of major animal taxa.
2. Understand the phylogenetic relationships among major animal taxa.
3. Construct and interpret phylogenies.
4. Identify and describe structures in animals from a variety of phyla and relate them to their functions, including nutrient acquisition, circulation, respiration, movement, nervous and sensory function, and reproduction.
5. Illustrate and exemplify physiological functions across the animal phyla.
6. Compare and contrast anatomical and physiological features of selected animal phyla.
7. Understand and compare different patterns of animal development and life cycles of animals and non-photosynthetic, single-celled, eukaryotic taxa.
8. Identify examples of animal behavior and explain the evolutionary significance of particular behaviors.
9. Describe the development, evolutionary origins and modifications of representative structures.
10. Describe the significance of sexual reproduction.
11. Describe the origin of multicellularity.
12. Describe mechanisms of evolutionary change, including speciation.
13. Provide evidence for evolution.
14. Acquire, use, and cite scientific literature appropriately in scientific writing.
15. Apply scientific methodology and reasoning through active experimentation, investigations, or other activities.
16. Demonstrate critical thinking/scientific reasoning skills.

Evaluation Methods

A variety of assessment techniques that may include midterm and final examinations with multiple choice, short answer, and essay questions, term papers, projects, case studies, student presentations, homework problems, quizzes, group activities, discussion forums, laboratory reports, laboratory practica.

Textbooks

A current (pursuant to C-ID policy) college level textbook and laboratory manual (published or prepared in-house) supporting the learning objectives of this course, and designed for majors, must be considered when matching courses to this descriptor. Example texts with appropriate level of coverage include, Campbell, et al. Biology, Sadava et al. Life: The Science of Biology, Freeman, Biological Science, and Hickman Zoology. A biology or zoology atlas may be useful.