

BIOL-UA 700 Evolutionary Zoology

Instructor:

Matthew Rockman

Course Description:

Animals are one of life's most successful lineages, occupying nearly every environment. This course provides an introduction to the diversity of animal form and function in the context of phylogeny and evolution, with a focus on the invertebrates, the majority of animals. Lectures will be devoted alternately to individual branches of the tree of animals and to common themes in the ways animals have evolved to fit and shape their environments. We will discuss morphology, physiology, reproduction, development, and ecology. We will discuss the unique genomic and molecular characteristics of each branch of animal life, with attention to the ways that non model organisms can provide insights into core cellular and molecular processes, including cell-cell communication and biomineralization. We will also discuss the intersection of these animals with human interests, including economic zoology, ecosystem services, and medicine. In laboratory and field exercises, students will learn to collect and identify invertebrate animals and to form and test hypotheses about their attributes.

Pre-requisites:

Molecular and Cell Biology I (BIOL-UA 21) and one of the following
Molecular and Cell Biology II (BIOL-UA 22) or
Fundamentals of Ecology (BIOL-UA 63) or
Intro to Neural Science (BIOL-UA 100)

Textbook and Required Materials:

N/A

Grading:

Take Home Exams	30%
Quizzes and discussion write-ups	20%
Laboratory notebook	36%

Topics:

Introduction: What are animals?
Animal origins & Ctenophora
Porifera and Placozoa
Cnidaria
Bilateria
Xenacoelomorphs and Platyhelminths
Echinoderms
Bryozoa
Annelids
Life-history evolution
Deuterostomes
Urochordates
Molluscs
Allometry, heterochrony, and theoretical morphology

Phanerozoic Faunas and Mass Extinctions

Micrometazoans

Introduction to Panarthropoda

Transitions to terrestrial life

Parasitism

Nematodes

Marine Arthropods

Terrestrial Arthropods

The *cis*-regulatory hypothesis