Ecology and Evolutionary Biology (EEB)

eeb.uconn.edu

5050. Fundamentals of Ecological Modeling

Four credits. Two lectures and one 2-hour laboratory. Prerequisite: STAT 1000Q or 1100Q or 3445 or 5005 or 5505; or equivalent with instructor consent.

Quantitative inference from ecological and environmental data. Choosing modeling methods based on knowledge of biological processes. Frequentist and Bayesian approaches; analysis of real and simulated data sets.

5100. Preparing for a Career in Ecology and Evolutionary Biology

One credit. Prerequisite: Open to first and second year graduate students in EEB, others with permission.

Introduction to the design and execution of scientific research, career planning, communication of science to multiple audiences, and broader impacts of scientific work.

5110. Writing Research Proposals and Fellowship Applications

Two credits. Prerequisite: Open only to Ecology and Evolutionary Biology graduate students; instructor consent required. May be repeated for a maximum of six credits. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

The craft of writing persuasive fellowship applications and funding proposals in ecology, evolutionary biology, systematics, and conservation biology. Students apply for financial support from agencies, foundations, and other sources. Includes peer review.

5200. Biology of Fishes

Four credits. Prerequisite: Instructor consent.

Introduction to the biology of fishes, with an emphasis on adaptation and evolutionary diversification. Topics include the evolution of major groups, morphology, physiology, behavior, and population and community ecology. Lectures, critical discussions of current journal articles, student presentations, and exercises in the field and laboratory. A research paper and class presentation are required on a topic pre-approved by the instructor.

5203. Developmental Plant Morphology

Four credits.

Exploration and analysis of diversity in plant form using basic principles of plant construction and development. A research paper is required, in which the principles learned in lecture are applied to the analysis of the development of a plant from seed through reproductive maturity.

5204. Aquatic Plant Biology

Four credits.

Field and laboratory-oriented study of the anatomy, morphology, ecology, physiology, systematics and evolution of vascular aquatic and wetland plants. A research paper and class presentation are required on a topic pre-approved by the instructor.

5215. Physiological Ecology of Animals

Three credits. Prerequisite: Instructor consent.

Physiology of animals in an evolutionary context. Lectures and critical discussions of current journal articles. A research paper and class presentation are required on a topic pre-approved by the instructor.

5220. Evolution of Green Plants

Four credits.

Evolution of morphological and genomic traits marking the conquest of land, the diversification of land plants, and the significance of plants in the evolution of life on earth, global climates and human civilizations. Laboratory session includes study of morphological and anatomical characters of extant and fossil plants, phylogenetic inference from morphological and molecular characters, and discussion of primary literature.

5240. Biology of Bryophytes and Lichens

Four credits.

Diversity, evolution, ecology, development and taxonomy of the bryophytes (mosses, liverworts, and hornworts) and lichen-forming fungi.

5250. Biology of the Algae

Four credits.

Laboratory and field-oriented study of the major groups of algae, emphasizing structure, function, systematics, and ecology.

5254. Mammalogy

Four credits.

Lectures cover diversity, natural history (including behavior, ecology, reproduction, etc.), and evolution of mammals; readings from original literature are included. Laboratories cover anatomy, systematics, and distribution of major groups of mammals.

5265. Herpetology

Four credits. Prerequisite: Instructor consent.

Lectures cover environmental physiology, ecology, and behavior of amphibians and reptiles. Emphasis is on readings from the original literature. Laboratories cover evolution, systematics, and distribution of major groups of the world.

5271. Systematic Botany

Four credits. Prerequisite: Instructor consent.

Classification, identification, economic importance, evolution and nomenclature of flowering plants. Laboratory compares vegetative and reproductive characteristics of major families. A research paper and class presentation are required on a topic pre-approved by the instructor.

5300. Practical Genomics in Ecology and Evolution

Three credits. Prerequisite: Open only to graduate students in biological sciences and related fields, others with consent.

Computational biology skills. Focused training on analytical approaches for genomic data generated in ecology and evolutionary biology. Practical activities include writing basic scripts, accessing public data repositories, and analyzing genomic data with existing open source software to answer questions of biological interest.

5301. Population and Community Ecology

Three credits. Prerequisite: Open only to Ecology and Evolutionary Biology graduate students, others with consent.

Overview of population and community ecology, including population regulation and dynamics, metapopulations, species interactions, biodiversity, community structure, and evolutionary ecology. Theoretical and case-history approaches, emphasizing plants, invertebrates, and vertebrates. Lecture, discussion, and exercises in analysis and modeling.

5310. Conservation Biology

Three credits.

Case studies and theoretical approaches to conservation of biological diversity, genetic resources, plant and animal communities, and ecosystem functions. Topics emphasize ecological and evolutionary principles that form the scientific basis of this emerging, interdisciplinary field, as well as socio-political, legal, economic, and ethical aspects of conservation.

5333. Evolutionary Developmental Biology

Three credits.

Advanced course in evolutionary biology, emphasizing the underlying developmental bases of evolutionary change. Concepts of homology, constraint, and heterochrony, with examples from both animal and plant systems.

5335W. Vertebrate Social Behavior

Three credits.

Lectures and discussions dealing with various aspects of vertebrate social behavior, including territoriality, mating systems, sexual selection, and group behavior. The emphasis is on reading and critical analysis of original literature.

5347. Principles and Methods of Systematic Biology

Four credits. Prerequisite: Instructor consent.

Basic concepts and modern procedures employed in systematic biology: literature retrieval, species description, phylogenetic inference, nomenclature, and current conceptual issues. Laboratories include computer techniques in phylogenetic analysis.

5348. Population Genetics

Four credits. Recommended preparation: EEB 2245 or equivalent, MCB 2400 or MCB 2410 or equivalent.

Provides a theoretical background for studies in evolution. Emphasis on understanding the conceptual foundations of the field and on the application of these concepts to an understanding of the roles of mutation and evolution of populations.

5349. Phylogenetics

Four credits. Prerequisite: EEB 5347.

Estimation of genealogies at the level of species and above, and their application and relevance to various biological disciplines, including systematics, ecology, and morphological and molecular evolution. Surveys both parsimony and model-based methods, but emphasizes maximum likelihood and Bayesian approaches.

5350. Molecular Systematics

Two credits. Prerequisite: Instructor consent.

Exploration of key literature focusing on the practical aspects of incorporating knowledge of DNA sequence evolution into phylogenetic tree construction. Laboratory methods for collection of molecular data including management, extraction, amplification, and sequencing.

5360. Physiological Ecology of Plants

Three credits. Not open to students who have passed EEB 3360.

The complex relationships between plants and their environment, with a focus on the unique physiological processes of plants that underlie their ecology. The impact of human-driven global change is a cross-cutting theme.

5369. Current Topics in Biodiversity

One credit. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Analysis and discussion of current literature on biodiversity.

5370. Current Topics in Conservation Biology

One credit. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Analysis and discussion of current literature on conservation.

5449. Evolution

Three credits.

A review of our current understanding of the patterns and processes of organic evolution. Class periods will include discussion and critical analysis of primary literature.

5477. Insect Phylogeny

Three credits.

A review of our current understanding of the evolutionary relationships of the major orders and families of insects, including the phylogenetic position of Insecta within Arthropoda.

5480. Science Communication I: Speaking to Public Audiences

Three credits. Prerequisite: Instructor consent; intended for graduate students in a STEM field or advanced undergraduates with experience in STEM research or journalism.

Readings from the primary literature on factors influencing the success of science communications, analysis of video examples of science communicators, and discussion of the relationship of scientists to the press, public and specialized audiences. Class exercises include video-recording mock interviews, working directly with journalists, writing social media posts, and exchanging constructive feedback with peers on speaking and interview skills.

5482. Science Communication II: Writing for Public Audiences

Three credits. Prerequisite: Instructor consent; intended for graduate students in a STEM field or advanced undergraduates with experience in STEM research or journalism.

Readings from the primary literature on factors influencing the success of science communications, analysis of science writings for public and specialized audiences, and discussion of the relationship of scientists to the public and specialized audiences. Class exercises include writing about science in a variety of styles accessible to non-scientists, including social media posts, developing graphical data illustrations, and exchanging constructive feedback with peers on writing skills.

5500. Introduction to Natural History Collections

One credit. Prerequisite: open only to Ecology and Evolutionary Biology graduate students; instructor consent required. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Training required for work in the EEB Biodiversity Research Collections Facility. The uses of natural history collections; policies, resources, and databases of the Collection Facility; specimen preparation and labeling; legal and ethical issues; threats to natural history collections.

5813. Evolutionary Ecology

Three credits. Prerequisite: Open only to graduate students in biological sciences and related fields, others with consent.

Unifies ecological and evolutionary thinking about shared core ideas, including foundational concepts such as fitness, optimality, coexistence, speciation, dispersal, community assembly, and spatial and temporal scales. Discussions and lectures will explore each concept from ecological and evolutionary viewpoints and then seek to reconcile differences and find novel intersections. Format includes student-led discussions, modeling exercises, and both independent and group projects.

5881. Internship in Ecology, Conservation, or Evolutionary Biology

Zero credits. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

An internship with a non-profit organization, a governmental agency, or a business under the supervision of Ecology and Evolutionary Biology faculty. Activities relevant to the practice of ecology, biodiversity science, evolutionary biology, or conservation biology will be planned and agreed upon in advance by the job site supervisor, the faculty coordinator, and the intern.

5889. Research

Variable (1-6) credits. Prerequisite: Instructor consent. May be repeated for credit.

Conferences and laboratory work covering selected fields of Ecology and Evolutionary Biology.

5891. Internship in Ecology, Conservation, or Evolutionary Biology

Variable (1-9) credits. Prerequisite: Instructor consent. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

An internship with a non-profit organization, a governmental agency, or a business under the supervision of Ecology and Evolutionary Biology faculty. Activities relevant to the practice of ecology, biodiversity, evolutionary biology, or conservation biology will be planned and agreed upon in advance by the job site supervisor, the faculty coordinator, and the intern. One credit may be earned for each 42 hours of pre-approved activities up to a maximum of nine credits.

5894. Seminar

Variable (1-3) credits. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Study and discussion of current researches, books and periodicals in the field of Biology. Subtopic designations: Ec, Ecology; M, Mammalogy; Mec, Marine Ecology; Pr, Parasitology; En, Entomology; Bi, Biogeography; Ev, Evolution; Sy, Systematics.

5895. Investigation of Special Topics

Variable (1-6) credits. Prerequisite: Instructor consent. May be repeated for credit.

Advanced study in a field within Ecology and Evolutionary Biology.

5899. Independent Study

Credits and hours by arrangement, not to exceed three. Prerequisite: Instructor consent. May be repeated for up to six credits with change in content.

A reading course for those wishing to pursue special work in biology. It may also be elected by undergraduate students preparing to be candidates for degrees with distinction.

6480. Seminar in Vertebrate Biology

One credit. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Analysis and discussion of current literature in vertebrate biology.

6481. Seminar in Biodiversity

One credit. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Provides the opportunity for students to present research plans, reports of work in progress, and full-length seminars on completed research projects in ecology, systematics, and evolutionary biology to a supportive but critical audience.

6482. Seminar in Spatial Ecology

One credit. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Analysis and discussion of current literature in spatial ecology.

6483. Seminar in Marine Biology

One credit. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Analysis and discussion of current literature in marine biology.

6484. Seminar in Plant Ecology

One credit. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Analysis and discussion of current literature in plant ecology.

6485. Seminar in Comparative Biology

One credit. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Analysis and discussion of current literature in evolution and comparative ecology.

6486. Seminar in Systematics

One credit. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Analysis and discussion of current literature in systematic biology.

6487. Seminar in Parasitology

One credit. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Analysis and discussion of current literature in parasitology.

6490. Seminar in Behavioral Ecology

One credit. May be repeated for credit. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Analysis and discussion of current literature in behavioral ecology.