

Ecology and Evolutionary Biology

For courses in other departments that may count toward the major, see the printed YCPS or consult the director of undergraduate studies.

E&EB 115a E&EB 515a, Conservation Biology.

MW 10.30-11.20 1HTBA

JEFFREY POWELL, WALTER JETZ

Sc (33)

An introduction to ecological and evolutionary principles underpinning efforts to conserve Earth's biodiversity. Efforts to halt the rapid increase in disappearance of both plants and animals. Discussion of sociological and economic issues.

E&EB 122b , E&EB 522b, Principles of Evolution, Ecology, and Behavior.

MWF 11.30-12.20

STEPHEN STEARNS

Sc WR (34)

Principles of evolution, ecology, and behavior explained and illustrated by recent advances that have changed the field. Emphasis on major events in the history and key transitions in the organization of life. Ecological processes from organisms through populations and communities to the biosphere. Foraging, mating, and selfish and cooperative behavior placed in evolutionary and ecological context. *Recommended preparation: MCDB 120a or equivalent.*

E&EB 123Lb E&EB 523Lb,, Laboratory for Principles of Evolution, Ecology, and Behavior.

TWTh 1.30-4.30

MARTA WELLS

Sc (0)

Experimental approaches to organismal and population biology, including study of the diversity of life. *Concurrently with or after E&EB 122b.*

E&EB 125b & G&G 125b, History of Life.

TTh 11.35-12.50

DEREK BRIGGS, JACQUES GAUTHIER

Sc (24)

Examination of fossil and geologic evidence pertaining to the origin, evolution, and history of life on Earth. Emphasis on major events in the history of life, on what the fossil record reveals about the evolutionary process, on the diversity of ancient and living organisms, and on the evolutionary impact of Earth's changing environment.

E&EB 160b, Diversity of Life.

MW 2.30-3.45

STAFF

Sc (37)

A survey of the diversity of organisms on Earth with a focus on their evolutionary history, biology, and adaptations to their environment.

E&EB 171a, The Collections of the Peabody Museum.

TTh 2.30-3.45

LEO BUSS

Sc WR (0)
Permission of instructor required
Meets during reading period

Exploration of selected scientific problems through the use of the biological and geological collections of the Peabody Museum.

Enrollment limited to freshmen and sophomores.

E&EB 210a , E&EB 510a, Introduction to Statistics: Life Sciences.

TTh 1.00-2.15

JONATHAN REUNING-SCHERER,
GUNTER WAGNER

QR (26)

Statistical and probabilistic analysis of biological problems presented with a unified foundation in basic statistical theory. Problems are drawn from genetics, ecology, epidemiology, and bioinformatics.

E&EB 220a E&EB 520a,, General Ecology.

MWF 10.30-11.20

DAVID POST, MELINDA SMITH,
DAVID VASSEUR

Sc (33)

The theory and practice of ecology, including the ecology of individuals, population dynamics and regulation, community structure, ecosystem function, and ecological interactions at broad spatial and temporal scales. Topics such as climate change, fisheries management, and infectious diseases are placed in an ecological context.

Prerequisite: MATH 112a or b or equivalent.

E&EB 225b E&EB 525b,, Evolutionary Biology.

TTh 11.35-12.50

PAUL TURNER, JEFFREY TOWNSEND

Sc (24)

An overview of evolutionary biology as the discipline uniting all of the life sciences. Reading and discussion of scientific papers to explore the dynamic aspects of evolutionary biology. Principles of population genetics, paleontology, and systematic; application of evolutionary thinking in disciplines such as developmental biology, ecology, microbiology, molecular biology, and human medicine.

Recommended preparation: E&EB 122b.

E&EB 226Lb E&EB 526Lb, Laboratory for Evolutionary Biology.

W 1.30-4:30

ADALGISA CACCONI

Sc (0)

The companion laboratory to E&EB 225b. Patterns and processes of evolution, including collection and interpretation of molecular and morphological data in a phylogenetic context. Focus on methods of analysis of species-level and population-level variation in natural populations.

Concurrently with or after E&EB 225b or with permission of instructor.

E&EB 235a, Evolution and Medicine.

TTh 11.35-12.50

STEPHEN STEARNS

Sc (0)

Survey of evolutionary insights that make important differences in medical research and clinical practice, including evolutionary mechanisms and the medical issues they affect. Individual genetic variation in susceptibility; evolutionary conflicts and tradeoffs in reproductive medicine; the evolution of antibiotic resistance and virulence in pathogens; emerging diseases; the evolution of aging; cancer as an evolutionary process.

After MCDB 120a or E&EB 122b, or with permission of instructor.

E&EB 240a E&EB 540a , Animal Behavior.

MW 9.00-10.15 ; 1 HTBA

SUZANNE ALONZO

Sc WR (32)

An introduction to the study of animal behavior from an evolutionary and ecological perspective. History and methods of studying animal behavior. Topics include foraging, predation, communication, reproduction, cooperation, and the role of behavior in conservation.

After E&EB 122b.

E&EB 246a, E&EB 546a, Plant Diversity & Evolution.

MW 1.00-2.15

STAFF

Sc (0)

Introduction to the evolutionary relationships of plant lineages. Exploration of the complexity, diversity, and characteristics of the major plant groups, including the green algae, mosses, ferns, conifers, and flowering plants, within a phylogenetic context.

To be taken concurrently with E&EB 247Lb. Prerequisite: a general understanding of introductory biology and evolution.

E&EB 247La, E&EB 547La, Lab:Plant Diversity& Evolution.

T 1.00-4.00

STAFF

Sc (26)

Local flora field research; hands-on experience with the plant groups examined in the accompanying lectures.

To be taken concurrently with E&EB 246b.

E&EB 250a, E&EB 550a, Biology of Terrestrial Arthropods.

TTh 11.35-12.50

MARTA WELLS

Sc (24)

Evolutionary history and diversity of terrestrial arthropods (body plan, phylogenetic relationships, fossil record); physiology and functional morphology (water relations, thermoregulation, energetics of flying and singing); reproduction (biology of reproduction, life cycles, metamorphosis, parental care); behavior (migration, communication, mating systems, evolution of sociality); ecology (parasitism, mutualism, predator-prey interactions, competition, plant-insect interactions).
After E&EB 122b.

E&EB 251La, E&EB 551La Laboratory for Biology of Terrestrial Arthropods.

W 1.30-5.00

MARTA WELLS

Sc (0)

Comparative anatomy, dissections, identification, and classification of terrestrial arthropods; specimen collection; field trips.
Concurrently with or after E&EB 250a.

E&EB 264b, E&EB564b Ichthyology.

MWF 1.30-2.20

STAFF

Sc (36)

A survey of fish diversity, including jawless vertebrates, chimaeras and sharks, lungfishes, and ray-finned fishes. Topics include the evolutionary origin of vertebrates, the fossil record of fishes, evolutionary diversification of major extant fish lineages, biogeography, ecology, and reproductive strategies of fishes.

E&EB 265Lb, E&EB565Lb, Laboratory for Ichthyology.

T 1.00-4.00

STAFF

Sc (26)

Laboratory and field studies of fish diversity, form, function, behavior, and classification. The course primarily involves study of museum specimens and of living and fossil fishes.
Concurrently with E&EB 264b.

E&EB 272b, E&EB 672b, Ornithology.

MWF 9.25-10.15

RICHARD PRUM

Sc (32)

An overview of avian biology and evolution, including the structure, function, behavior, and diversity

of birds. The evolutionary origin of birds, avian phylogeny, anatomy, physiology, neurobiology, breeding systems, and biogeography.

E&EB 273Lb, E&EB 672Lb, Laboratory for Ornithology.

T 1:30

RICHARD PRUM

Sc (0)

Permission of instructor required

Laboratory and field studies of avian morphology, diversity, phylogeny, classification, identification, and behavior.

Concurrently with E&EB 272b.

E&EB 275a, E&EB 575a, Biological Oceanography.

MW 11.35-12.50 ; 1 HTBA

MARY BETH DECKER

(34)

Permission of instructor required

Exploration of a range of coastal and pelagic ecosystems. Relationships between biological systems in the ocean and the physical processes that control the stratification and movements of water.

Anthropogenic impacts on oceans, such as the effects of fishing, aquaculture, and global warming.

Includes three optional Friday field trips.

Enrollment limited to 15.

E&EB 330a, E&EB 630a, Ecosystem Analysis.

M T 1.00-5.00

MELINDA SMITH, PETER RAYMOND

Sc (0)

An outdoor overview of the study of ecosystems. How the structure of ecosystems develops (e.g., biodiversity) and how ecosystems function (e.g., process nutrients or pollutants). The impact of global changes, such as climate change and eutrophication, on ecosystem structure and function. Field-based group and independent projects focused on New England ecosystems.

Prerequisite: E&EB 220a or permission of instructor.

E&EB 460b, E&EB 960b, Studies in Evolutionary Medicine I.

TTh 3:30-5:20

STEPHEN STEARNS, DURLAND FISH,
ALISON GALVANI, PAUL TURNER

Sc (0)

Permission of instructor required

Principles of evolutionary biology applied to issues in medical research and practice, such as lactose and alcohol tolerance; the "hygiene hypothesis"; genetic variation in drug response and pathogen resistance; spontaneous abortions, immune genes, and mate choice; the evolution of aging; the ecology and evolution of disease; and the emergence of new diseases. Students develop proposals for research to be conducted during the summer.

Admission by competitive application; forms are available on the EEB Web site.

E&EB 470a & b, Tutorial.

1 HTBA

MARTA WELLS

(0)

Permission of instructor required

Individual or small-group study for qualified students who wish to investigate an area of ecology or evolutionary biology *not presently covered by regular courses*. A student must be sponsored by a faculty member who sets requirements and meets weekly with the student. One or more written examinations and/or a term paper are required. To register, the student must submit a written plan of study approved by the faculty instructor to the director of undergraduate studies. Students are encouraged to apply during the term preceding the tutorial. The proposal must be submitted by Wednesday, September 9, for the fall term and Wednesday, January 20, for the spring term. The final paper is due in the hands of the director of undergraduate studies by Friday, December 11, for the fall term and Monday, April 26, for the spring term. In special cases, with approval of the director of undergraduate studies, this course may be elected for more than one term, but only one term will count as an elective for the major. Normally, faculty sponsors must be members of the EEB department.

One term of this course fulfills the senior requirement for the B.A. degree if taken in the senior year.

E&EB 475a & b, Research.

1 HTBA

MARTA WELLS

(0)

Permission of instructor required

One term of original research in an area relevant to ecology or evolutionary biology. This may involve, for example, laboratory work, fieldwork, or mathematical or computer modeling. Students may also work in areas related to environmental biology such as policy, economics, or ethics. The research project may not be a review of relevant literature but must be original. In all cases students must have a faculty sponsor who oversees the research and is responsible for the rigor of the project. Students are expected to spend ten hours per week on their research projects. Using the form available from the office of undergraduate studies or from the Classes server, students must submit a research proposal that has been approved by the faculty sponsor to the director of undergraduate studies, preferably during the term preceding the research. Proposals are due Wednesday, September 9, for the fall term and Wednesday, January 20, for the spring term. The final research paper is due in the hands of the director of undergraduate studies by Friday, December 11, for the fall term and Monday, April 26, for the spring term.

Fulfills the senior requirement for the B.A. degree if taken in the senior year.

E&EB 495a & b, Intensive Senior Research.

1 HTBA

MARTA WELLS

(0)

Permission of instructor required

Two terms of intensive original research during the senior year done under the sponsorship of a faculty member. Similar to other research courses except that a more substantial portion of the student's time should be spent on the research project (an average of twenty hours per week). A research proposal approved by the sponsoring faculty member using the form available from the office of undergraduate studies or from the Classes server must be submitted to the director of undergraduate studies by September 9. Interim oral reports and a final written research paper are required. The final paper is due Monday, April 26.

Credit only on completion of both terms. Fulfills the senior requirement and leads to the intensive B.S. degree.

The rest could stay the same except there are a few that need to be deleted.

<p>E&EB 626a & 627a TTH 11:35- 12:50</p>	<p><u>Research Topics in Molecular Ecology</u></p>	<p><u>Caccone</u></p>	
<p>T, Th 10:30- 11:20</p>	<p>E&EB 632b HTBA</p>	<p><u>E&EB 632b The analysis of ecological time-series.</u> An introduction to the theory and practice of time series analysis in ecology. Topics will include detrending, model fitting, and frequency-domain analysis of univariate and multivariate data, with a particular emphasis on linking biological and physical processes. Students will develop practical skills by addressing a variety of contemporary ecological problems using data of their own choosing.</p>	<p><u>Vasseur</u></p>

	E&EB 810a T, Th 11:30- 12:45 OML 201	<u>Dynamics of Evolving Systems.</u> An introduction to the ways in which the structure and behavior of evolving biological systems can be described, modeled, and analyzed. Examination of model systems as well as modeling of laboratory and field phenomena.	Vaisnys
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E&EB 900a/b	<u>Laboratory Rotations.</u> First Year Introduction to Research and Rotations.	DGS	
	E&EB 930a G &G 703a F 2:30-4	Seminar in Systematics.	Gauthier
	E&EB 950 a/b	Second Year Research by arrangement with faculty.	Staff