ECOLOGY AND EVOLUTIONARY BIOLOGY

Osborn Memorial Laboratories, 203.432.3837
http://eeb.yale.edu
M.S., Ph.D.

Chair
David Vasseur

Professors Richard Bribiescas (*Anthropology*), Craig Brodersen (*School of the Environment*), Nicholas Christakis (*Sociology*), Liza Comita (*School of the Environment*), Casey Dunn, Erika Edwards, Vanessa Ezenwa, Vivian Irish (*Molecular, Cellular, and Developmental Biology*), Walter Jetz, Thomas Near, David Post, Jeffrey Powell, Richard Prum, Eric Sargis (*Anthropology*), Oswald Schmitz (*School of the Environment*), David Skelly (*School of the Environment*), Jeffrey Townsend (*Public Health*), Paul Turner, David Vasseur

Associate Professors Forrest Crawford (*Public Health*), Nathan Grubaugh (*Epidemiology*), James Noonan (*Genetics*), Carla Staver, Alison Sweeney

Assistant Professors Jennifer Coughlan, Martina Dal Bello, Martha Muñoz, C. Brandon Ogbunu, Eric Slessarev, Serena Tucci (*Anthropology*), Michelle Wong

Senior Lecturer Marta Martínez Wells

Lecturers Adalgisa Caccone, Gordon Geballe, Joshua Moyer, Linda Puth

Research Scientist Mary Beth Decker

FIELDS OF STUDY

The Department of Ecology and Evolutionary Biology (E&EB) offers training programs in organismal biology, ecology, and evolutionary biology.

SPECIAL REQUIREMENTS FOR THE PH.D. DEGREE

Each entering student, in consultation with the faculty Entry Committee, develops a specific program of courses, seminars, laboratory research, and independent reading tailored to the student's interests, background, and goals. There are normally no foreign language requirements. The course requirements to advance to candidacy in E&EB are:

1. E&EB 500* and E&EB 501,* Advanced Topics in Ecology and Evolutionary Biology;
2. E&EB 545,* a course on the responsible conduct of research;
3. weekly E&EB seminars;
4. symposia of faculty and graduate student research;
5. two research rotations (E&EB 901,* Research Rotation I, and E&EB 902,* Research Rotation II) in the first two years; and
6. a minimum of three additional graduate-level courses (numbered 500 and above) with a grade of Honors in at least two of these.

Teaching experience is regarded as an integral part of the graduate training program. All students are required to teach three courses, typically during their first three years of study. Students who require additional support from the graduate school may be required to teach additional terms after they have fulfilled the academic teaching requirement.

By the middle of the fourth term of study, each student organizes a formal pre-prospectus consultative meeting with the student's advisory committee to discuss the planned dissertation research. Before the beginning of the fifth term, students present and defend their planned dissertation research at a prospectus meeting, at which the department determines the viability and appropriateness of the student's Ph.D. proposal. A successful prospectus meeting and completion of course requirements results in admission to candidacy for the Ph.D. The prospectus is held by the end of the fourth semester. Following admission to candidacy, the student must hold committee meetings at least once a year and remain in good academic standing by showing significant progress on their thesis project. The final requirements for a Ph.D. include completion, presentation, and successful defense of the dissertation, and submission of copies of the dissertation to the graduate school and to the Marx Science and Social Science Library.

In some cases, such as when there is extensive field work, the prospectus meeting can be delayed by one term. A request for a delay must come from the dissertation committee adviser and must be approved by the DGS. In these exceptional cases, admission to candidacy may not be required for registration for the third year of graduate study.

* This course is graded on a Satisfactiory/Unsatisfactory basis.

HONORS REQUIREMENT

Students must meet the graduate school's requirement of Honors in two courses by the end of the fourth term of study. The E&EB department also requires an average grade of at least High Pass in coursework during the first two years of study.

MASTER'S DEGREE

M.S. (en route to the Ph.D.) The course requirements for the M.S. are the same those as for advancing to candidacy in the Ph.D. program except that an M.S. does not require successful completion of a prospectus meeting.

Additional information on the department, faculty, courses, and facilities is available from Kelly Pyers, Registrar, Department of Ecology and Evolutionary Biology, Yale University, PO Box 208106, New Haven CT 06520-8106; email, kelly.pyers@yale.edu; tel., 203.432.3837; http://eeb.yale.edu.

COURSES

E&EB 500a and E&EB 501b, Advanced Topics in Ecology and Evolutionary Biology Staff
Topics to be announced. Graded Satisfactory/Unsatisfactory.

E&EB 515a, Conservation Biology Linda Puth
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 520a, General Ecology David Vasseur and Michelle Wong
A broad consideration of the theory and practice of ecology, including the ecology of individuals, population dynamics and regulation, community structure, ecosystem function, and ecological interactions on broad spatial and temporal scales. Topics such as climate change, fisheries management, and infectious disease are placed in an ecological context.

E&EB 523Lb, Laboratory for Evolution, Functional Traits, and the Tree of Life Staff
Experimental approaches to organismal and population biology, including study of the diversity of life.

E&EB 525b, Evolutionary Biology Paul Turner and Jennifer Coughlan
An overview of evolutionary biology as the discipline uniting all of the life sciences. Evolution explains the origin of life and Earth's biodiversity, and how organisms acquire adaptations that improve survival and reproduction. This course uses reading and discussion of scientific papers to emphasize that evolutionary biology is a dynamic science, involving active research to better understand the mysteries of life. We discuss principles of population genetics, paleontology, and systematics; and application of evolutionary thinking in disciplines such as developmental biology, ecology, microbiology, molecular biology, and human medicine.

E&EB 542b, Behavioral Ecology Vanessa Ezenwa
An introduction to the study of animal behavior from an evolutionary and ecological perspective. Topics include decision-making, group living and cooperation, sexual selection and mating behavior, signaling and communication. In addition to lectures, in-class discussions and activities, students engage in the material by design and implement their own research projects. Prerequisite: Biology 104 or permission of instructor

E&EB 545b, Responsible Conduct of Research Casey Dunn
This five-week discussion seminar considers issues related to the responsible conduct of research. Topics addressed include research misconduct, plagiarism, data acquisition and management, mentoring and collaboration, authorship and peer review, the use of animals and humans in scientific research, sexual harassment, diversity, and balancing professional and personal life. Graded Satisfactory/Unsatisfactory. o Course cr

E&EB 546a, Plant Diversity and Evolution Erika Edwards
Introduction to the major plant groups and their evolutionary relationships, with an emphasis on the diversification and global importance of flowering plants.

E&EB 547a, Laboratory for Plant Diversity and Evolution Erika Edwards
Hands-on experience with the plant groups examined in the accompanying lectures. Local field trips.

E&EB 572b, Ornithology. Richard Prum
Structure, function, behavior, evolution, and diversity of birds. A general overview of avian biology and evolution. Topics include the evolutionary origin of birds, avian phylogeny, anatomy, physiology, neurobiology, behavior, breeding systems, and biogeography.

E&EB 573b, Lab for Ornithology Richard Prum

E&EB 635a, Evolution and Medicine Brandon Ogbunu
Introduction to the ways in which evolutionary science informs medical research and clinical practice. Diseases of civilization and their relation to humans' evolutionary past; the evolution of human defense mechanisms; antibiotic resistance and virulence in pathogens; cancer as an evolutionary process. Students view course lectures online; class time focuses on discussion of lecture topics and research papers. Prerequisites: BIOL 101–BIOL 104.

E&EB 654a, Phylogenetic Biology Casey Dunn
Phylogenetic biology is the study of the evolutionary relationships between organisms, and the use of evolutionary relationships to understand other aspects of organism biology. This course surveys phylogenetic methods, providing a detailed picture of the statistical, mathematical, and computational tools for building phylogenies and using them to study evolution. We also examine the application of these tools to particular problems in the literature and emerging areas of study.

E&EB 750a, Forgotten Grassy Ecosystems Carla Staver
Grassy ecosystems—including savannas and grasslands—have historically been relatively undervalued, often confused and misclassified as forests. This seminar includes weekly readings and discussion about the world's grassy ecosystems in general and focusing on regional examples of overlooked savannas and grasslands. This seminar is intended for Ph.D. students. It is open to master's students and undergraduates by permission of the instructor only, based on a one- or two-paragraph description of interest in the course.

E&EB 762a, Ecology of Landforms Eric Slessarev
This course is a combined graduate research seminar and research practicum that explores the linkage between ecological and geomorphic processes—between biology at Earth's surface and the shape and structure of that surface. This course is centered around two skill-building activities: (1) a series of presentations in which students deliver short mock lectures, lead subsequent discussion, and receive constructive feedback from the class; (2) a series of quantitative workshops (held in alternate weeks) in which the class collaboratively designs and codes a model or model(s) that relate to ecological and geomorphic processes. A primary focus of this course is understanding how biogeochemical cycles play out across hillslopes, watersheds, and fluvial landforms. Depending on student interest we may also address questions relating community ecology, population ecology, or evolutionary processes to landscape structure. Students should expect to hone their presentation skills and quantitative toolset, particularly with respect to spatial analysis and numerical modeling.

E&EB 901a or b, Research Rotation I Staff

E&EB 902a or b, Research Rotation II Staff

E&EB 930a or b / EPS 703a or b, Seminar in Systematics Jacques Gauthier
Topics and class time are chosen by the participants, and have included reading books and/or a series of papers on particular topics (e.g., homology; morphological phylogenetics; evolution of egg colors and exposed nesting in dinosaurs/birds; origin of snake ecology; conflicts between morphology and molecules; role of fossils in phylogenetic inference).