Committee on Evolutionary Biology

Department Website: http://evbio.uchicago.edu

Chair

- J. Timothy Wootton

Associate Chair

- Shannon Hackett

Faculty

- Zeray Alemseged, Organismal Biology and Anatomy
- Stefano Allesina, Ecology and Evolution
- Kenneth Angielczyk, Field Museum
- John Bates, Field Museum
- Jeremy Berg, Human Genetics
- Rüdiger Bieler, Field Museum
- Michael I. Coates, Organismal Biology and Anatomy
- Maureen L. Coleman, Geophysical Sciences
- Bruno de Medeiros, Field Museum
- Mason Fidino, Lincoln Park Zoo
- Michael J. Foote, Geophysical Sciences
- Lance Grande, Field Museum
- Shannon Hackett, Field Museum
- Lawrence R. Heaney, Field Museum
- Patrick S. Herendeen, Chicago Botanic Garden
- Fabiany Herrera, Field Museum
- Andrew Hipp, Morton Arboretum/Herbarium
- Robert Ho, Organismal Biology and Anatomy
- Sean Hoban, Morton Arboretum
- David Jablonski, Geophysical Sciences
- Susan M. Kidwell, Geophysical Sciences
- Marcus R. Kronforst, Ecology and Evolution
- Scott Lidgard, Field Museum
- Sarah London, Psychology
- Manyuan Long, Ecology and Evolution
- Thorston Lumbsch, Field Museum
- Zhe-Xi Luo, Organismal Biology and Anatomy
- Heather Marlow, Organismal Biology and Anatomy
- Robert D. Martin, Field Museum
- Jill Mateo, Comparative Human Development
- Lance J. Miller, Chicago Zoological Society (Brookfield Zoo)
- R. Michael Miller, Argonne National Laboratory
- Gregory M. Mueller, Chicago Botanic Garden
- Salikoko Mufwene, Linguistics
- Pavitra Muralidhar, Ecology and Evolution
- Jasmine Nirody, Organismal Biology and Anatomy
- John Novembre, Human Genetics
- Jingmai O'Connor, Field Museum
- Mercedes Pascual, Ecology and Evolution
- Nipam Patel, Marine Biological Laboratory
- Bruce Patterson, Field Museum
- Catherine Pfister, Ecology and Evolution
- Trevor D. Price, Ecology and Evolution

- Maanasa Raghavan, Human Genetics
- Clifton Ragsdale, Neurobiology
- Richard Ree, Field Museum
- Olivier Rieppel, Field Museum
- Callum F. Ross, Organismal Biology and Anatomy
- Sara Ruane, Field Museum
- Urs Schmidt-Ott, Organismal Biology and Anatomy
- Paul Sereno, Organismal Biology and Anatomy
- Neil Shubin, Organismal Biology and Anatomy
- Graham Slater, Geophysical Sciences
- Douglas Stotz, Field Museum
- Zewdi Tsegai, Organismal Biology and Anatomy
- Russell H. Tuttle, Anthropology
- Janet Voight, Field Museum
- Mark Webster, Geophysical Sciences
- Mark Westneat, Organismal Biology and Anatomy
- John Timothy Wootton, Ecology and Evolution

Emeritus

- Jerry Coyne, Ecology and Evolution
- Martin Feder, Organismal Biology and Anatomy
- James Hopson, Organismal Biology and Anatomy
- Michael LaBarbera, Organismal Biology and Anatomy
- Wen-Hsiung Li, Ecology and Evolution
- R. Eric Lombard, Organismal Biology and Anatomy
- Stephen Pruett-Jones, Ecology and Evolution
- Margaret Thayer, Field Museum
- Harold Voris, Field Museum
- Norm Wickett, Chicago Botanic Garden
- William Wimsatt, Philosophy
- Chung I Wu, Ecology and Evolution

The Committee on Evolutionary Biology (CEB) provides students with the opportunity for interdisciplinary study of all aspects of evolutionary biology. The committee consists of faculty members with primary appointments in departments in all four graduate divisions within the university and of associated faculty from institutions in the Chicago area, such as Argonne National Laboratory, Lincoln Park Zoo, Chicago Botanic Garden, the Marine Biological Laboratory, Morton Arboretum, and the Field Museum. The diversity of research interests represented by the collective expertise of the committee faculty contributes to its strong national and international reputation as a graduate training program.

Students in the committee have ready access to facilities at the associated institutions, including the more than 1,100 animals representing over 200 species at Lincoln Park Zoo, more than 17 million specimens in the Field Museum collections in botany, zoology, and paleontology, and libraries at the Field Museum. Various facilities for the study of molecular evolution and phylogenetic analysis are available to committee students, as are several student computer centers, an on-campus greenhouse, and digital equipment for off-site research.

In the Chicago area, committee students have access to the rich and diverse resources available at the Chicago Botanic Garden, Argonne National Laboratory, the Shedd Aquarium, the Morton Arboretum, and the many parks and lands managed by the local forest preserve and park districts.

The University of Chicago is a member of the Organization for Tropical Studies. Doctoral students in the committee have taken courses in tropical ecology and conducted research in Costa Rica through this affiliation. Recent evolutionary biology students have also conducted domestic research at a variety of field sites, including the Southwest Research Station of the American Museum of Natural History, Sierra Nevada Aquatic Research Laboratory, Kellogg Biological Station, the Marine Biological Laboratory at Woods Hole, and Friday Harbor Marine Laboratory. International research is conducted on every continent.

Program of Study

Most students in the Committee on Evolutionary Biology complete their Ph.D. program in about five and a half years.

The first and second years consist largely of course work and individual reading and research courses, aiming toward successful defense of a dissertation research proposal by the end of the Spring Quarter in the second year of study.

First year

Entering students are expected to have received a broad undergraduate training in biology and a good background in related quantitative subjects, such as chemistry, statistics and calculus. Students who are admitted with gaps in these areas may be required to remedy their deficiencies by taking appropriate courses during their first two years in the graduate program. The committee maintains a student advisory committee, which meets three times a year with each of the first and second year students to advise them on courses available, arbitrate on which courses meet the committee's course distribution requirements, and otherwise help students keep on track towards Ph.D. candidacy.

Second year

Second year students continue to meet with the student advisory committee until they pass their preliminary examination/dissertation proposal hearing. The first part of the second year may be taken up mostly with course work, supplemented more heavily by reading and research courses.

Reading and research requirements

CEB courses have been divided into seven broad areas. Students must successfully complete a course in five of the seven areas to be recommended for Ph.D. candidacy. The primary aim is that the student acquires considerable breadth in evolutionary biology; this breadth and the interdisciplinary research it permits should be the distinguishing feature of students working in the committee. In the first two years of study students generally enroll in three courses per quarter. This can be a combination of lecture, seminar, research, and reading formats.

Division of the Biological Sciences teaching assistant requirement program

During their tenure in the doctoral program, students are required to register for two evaluated teaching assistantships in two approved courses.

Dissertation proposal hearing and admission to Ph.D. candidacy

Students should select an advisor no later than Autumn Quarter of their second year. This advisor normally will become the chair of the student's dissertation proposal committee. The committee for the dissertation proposal hearing will be formed by the student and her/his advisor, subject to approval by the CEB Chair, when the student asks the CEB Chair in writing to approve her/his request to appoint the exam committee and hold the proposal hearing.

CEB students must present and defend their dissertation proposal, followed by an oral examination by a faculty committee on general issues in evolutionary biology. Students are expected to successfully defend their dissertation proposal by the end of the Spring Quarter of their second year in the Ph.D. program. After successfully defending their dissertation proposal, students may be recommended for candidacy for the Ph.D. by the CEB Chair.

Ph.D. dissertation

Upon successful completion of the dissertation proposal hearing and admission into candidacy for the Ph.D., students work on their dissertation projects in close consultation with their faculty advisor and dissertation committee. During a period of two to three years the student does primary original research, participates in seminars, discussion groups, and professional meetings and conferences, and completes the written Ph.D. dissertation. Students are expected to publish dissertation related research, and encouraged to submit a substantial part of their research for publication before Ph.D. completion. A student is expected to submit a dissertation outline and proposed timetable for dissertation completion six months before the estimated date of final defense. These plans must be approved by the advisory committee, and a copy submitted as part of the meeting report to the CEB Chair.

The Ph.D. in evolutionary biology is awarded based upon the candidate's having:

- Submitted a written dissertation reporting results of the student's original research in a form suitable for publication, which must be approved by the faculty advisor and dissertation committee.
- Successfully completed a final oral examination covering the student's field of specialization.
- Final approval of the dissertation by the CEB Chair and the University Dissertation Office.

Admission

We strongly advise students considering application to CEB to begin preparation of their application early in the autumn quarter, so that all materials will arrive by the annual deadline (https://biosciences.uchicago.edu/admissions/how-to-apply/). Foreign applicants whose first language is not English also must submit TOEFL or IELTS test scores with their application materials (http://gradadmissions.uchicago.edu/admissions/international/).

Students have the opportunity to apply for the M.S. degree while completing their work for the Ph.D. The M.S. degree is also awarded in special cases, usually in association with Ph.D. requirements for graduate students in the Committee on the Conceptual and Historical Studies of Science.

Further information also may be obtained from the program's home at http://evbio.uchicago.edu, or by sending an email to darwin@uchicago.edu.

Evolutionary Biology Courses

EVOL 30200. Chordates: Evolution and Comparative Anatomy. 100 Units.
Chordate biology emphasizes the diversity and evolution of modern vertebrate life, drawing on a range of sources (from comparative anatomy and embryology to paleontology, biomechanics, and developmental genetics). Much of the work is lab-based, with ample opportunity to gain firsthand experience of the repeated themes of vertebrate body plans, as well as some of the extraordinary specializations manifest in living forms. The instructors, who are both actively engaged in vertebrate-centered research, take this course beyond the boundaries of standard textbook content.
Instructor(s): M. Coates Terms Offered: Winter. L.
Prerequisite(s): Three quarters of a Biological Sciences Fundamentals sequence, including BIOS 20187 or BIOS 20235
Note(s): Offered Winter during even years. E.
Equivalent Course(s): BIOS 22250, ORGB 30250

EVOL 30300. Key Issues in Early Vertebrate Evolution. 100 Units.
Equivalent Course(s): ORGB 31300

EVOL 31200. Data Analysis in Ecol/Evol. 100 Units.
The course provides a basic introduction to statistics for biologists. We cover experimental design and many of the potential pitfalls associated with data analysis, including pseudoreplication, multiple testing, regression effects, setting up appropriate null models, and graphical presentation. Assumptions underlying elementary tests, including non-parametric vs parametric and fixed vs random effects will be clarified. We will not cover advanced methods of analysis, beyond straightforward linear models. Students will be encouraged to analyse their own datasets using R.
Instructor(s): T. Price Terms Offered: Autumn
Note(s): Required text: M. Whitlock & D. Schluter, Analysis of Biological Data, 2nd edition.
Equivalent Course(s): ECEV 31200

EVOL 31201. Mammalian Evolutionary Biology. 100 Units.
This course examines mammalian evolution-the rise of living mammals from ancient fossil ancestors stretching back over 300 million years. Lectures focus on the evolutionary diversification of mammals, including anatomical structure, evolutionary adaptations, life history, and developmental patterns. Labs involve detailed comparative study of mammalian skeletons, dissection of muscular and other systems, trips to the Field Museum to study fossil collections, and studies of human anatomy at the Pritzker School of Medicine. Students will learn mammalian evolution, functional morphology, and development, and will gain hands-on experience in dissection. Taught by instructors who are active in scientific research on mammalian evolution, the course is aimed to convey new insights and the latest progress in mammalian paleontology, functional morphology, and evolution. Prerequisite(s): Second-year standing and completion of a Biological Sciences Fundamentals sequence; or GEOS 13100-13200 or GEOS 22300, or consent of instructors.
Instructor(s): Z. Luo, K. Angielczyk Terms Offered: Autumn. L.
Prerequisite(s): Three quarters of a Biological Sciences Fundamentals Sequence or consent of instructors.
Note(s): E.
Equivalent Course(s): BIOS 23262, ORGB 31201

EVOL 31700. Macroevolution. 100 Units.
Patterns and processes of evolution above the species level, in both recent and fossil organism. A survey of the current literature, along with case studies.
Instructor(s): D. Jablonski Terms Offered: Spring
Equivalent Course(s): GEOS 36800

EVOL 31800. Taphonomy. 100 Units.
Lecture and research course on patterns and processes of fossilization, including rates and controls of soft tissue decomposition, post mortem behavior of skeletal hard parts, concentration and burial of remains, scales of time averaging, and the net spatial and compositional fidelity of (paleo)biologic information, including trends across environments and evolutionary time.
Instructor(s): S. Kidwell Terms Offered: Offered in alternate years.
Equivalent Course(s): GEOS 36700

EVOL 31900. Topics in Paleobiology. 100 Units.
In this seminar we investigate paleobiological or multidisciplinary topics of current interest to students and faculty. Previous subjects include the origin of phyla, historical and macro-ecology, the stratigraphic record and evolutionary patterns, and climate and evolution.
Instructor(s): D. Jablonski; S. Kidwell; G. Slater

Equivalent Course(s): ECEV 36900, GEOS 36900

EVOL 32245. Biomechanics: How Life Works. 100 Units.
This course will explore form and function in a diversity of organisms, using the principles of physics and evolutionary theory to understand why living things are shaped as they are and behave in such a diversity of ways. Biomechanics is at the interface of biology, physics, art, and engineering. We will study the impact of size on biological systems, address the implications of solid and fluid mechanics for organismal design, learn fundamental principles of animal locomotion, and survey biomechanical approaches. Understanding the mechanics of biological organisms can help us gain insight into their behavior, ecology and evolution.
Instructor(s): M. Westneat Terms Offered: Spring. L. Spring.
Prerequisite(s): Three quarters of a Biological Sciences Fundamentals sequence. Physics useful.
Note(s): This course will include a lab and will alternate years with BIOS 22233. E.
Equivalent Course(s): BIOS 22245, ORGB 32245

EVOL 32400. Invertebrate Paleobiology and Evolution. 100 Units.
This course provides a detailed overview of the morphology, paleobiology, evolutionary history, and practical uses of the invertebrate and microfossil groups commonly found in the fossil record. Emphasis is placed on understanding key anatomical and ecological innovations within each group and interactions among groups responsible for producing the observed changes in diversity, dominance, and ecological community structure through evolutionary time. Labs supplement lecture material with specimen-based and practical application sections. An optional field trip offers experience in the collection of specimens and raw paleontological data. Several "Hot Topics" lectures introduce important, exciting, and often controversial aspects of current paleontological research linked to particular invertebrate groups. (L)
Instructor(s): M. Webster Terms Offered: Autumn
Prerequisite(s): GEOS 13100 and 13200 or equivalent; completion of the general education requirement in the Biological Sciences, or consent of instructor.
Note(s): E.
Equivalent Course(s): GEOS 36300, GEOS 26300, BIOS 23261

EVOL 32700. Philosophical Problems in the Biological Sciences. 100 Units.
TBD
Equivalent Course(s): HIPS 22700, PHIL 32700, CHSS 37600

EVOL 33700. Developmental Genetics & Evolution. 100 Units.
TBD
Equivalent Course(s): BIOS 20256

EVOL 33850. Evolution and Development. 100 Units.
The course will provide a developmental perspective on animal body plans in phylogenetic context. The course will start with a few lectures, accompanied by reading assignments. Students will be required to present a selected research topic that fits the broader goal of the course and will be asked to submit a referenced written version of it after their oral presentation. Grading will be based on their presentation (oral and written) as well as their contributions to class discussions. Prerequisite(s): Advanced undergraduates may enroll with the consent of the instructor.
Instructor(s): U. Schmidt-Ott Terms Offered: Spring
Prerequisite(s): Advanced undergraduates may enroll with the consent of the instructor.
Note(s): E.
Equivalent Course(s): DVBI 33850, BIOS 22306, ORGB 33850

EVOL 34500. Advanced Topics in Evolution. 100 Units.
While evolution by natural selection is an elegantly simple phenomenon, modern research in evolutionary biology contains a variety of controversial, and sometimes confusing, topics. In this course, we will explore, as a group, a select list of controversial or confusing topics in evolutionary biology through a mix of student-led presentations and discussion of the primary literature. Each student will also write a review paper about his or her selected topic.
Instructor(s): M. Kronforst Terms Offered: Spring
Equivalent Course(s): ECEV 34500

EVOL 34800. Kinship and Social Systems. 100 Units.
This course will use a biological approach to understanding how groups form and how cooperation and competition modulate group size and reproductive success. We will explore social systems from evolutionary and ecological perspectives, focusing on how the biotic and social environments favor cooperation among kin as well as how these environmental features influence mating systems and inclusive fitness. While a strong background in evolutionary theory is not required, students should have basic understanding of biology and natural selection. Course will use combination of lectures and discussion.
Instructor(s): J. Mateo
Note(s): CHDV Distributions: A; 1 Not offered in 2023-2024
Equivalent Course(s): ECEV 34800, CHDV 34800

EVOL 35300. Phylogenetic Comparative Methods. 100 Units.
This is a graduate seminar course about the uses of phylogenetic trees in evolution and ecology, emphasizing historical inference of phenotypic traits, geographic ranges, and community ecology. (This is not a course on how to infer phylogenies, or their uses in studies of molecular evolution and population genetics.) Within this scope we will focus on topics of popular interest and relevance to student research. The format of the 2-hour weekly meeting will be somewhat fluid, but I anticipate giving introductory remarks or a lecture on main topics, followed by discussion of primary literature, and opportunities to work hands-on with software (bring your own laptop). Small-group assignments will be given to develop and present short tutorials on conducting analyses of real data.
Instructor(s): R. Ree, A. Hipp Terms Offered: Winter. offered in alternate (even) years

EVOL 35301. Birds of the World. 100 Units.
TBD

EVOL 35401. Reconstructing the Tree of Life: An Introduction to Phylogenetics. 100 Units.
This course is an introduction to the tree of life (phylogeny): its conceptual origins, methods for discovering its structure, and its importance in evolutionary biology and other areas of science. Topics include history and concepts, sources of data, methods of phylogenetic analysis, and the use of phylogenies to study the tempo and mode of lineage diversification, coevolution, biogeography, conservation, molecular biology, development, and epidemiology. One Saturday field trip and weekly computer labs required in addition to scheduled class time. This course is offered in alternate (odd) years.
Instructor(s): R. Ree.; A. Hipp Terms Offered: Autumn. This course is offered in alternate (odd) years. L.
Prerequisite(s): Three quarters of a Biological Sciences Fundamentals Sequence or consent of instructor
Note(s): E. CB.
Equivalent Course(s): BIOS 23404

EVOL 35800. Classics in Evolutionary Genetics. 100 Units.
Major classic papers in evolutionary genetics that had great impact on the development of the field are reviewed.
Instructor(s): M. Long Terms Offered: Spring
Equivalent Course(s): ECEV 35800

EVOL 35901. Genomic Evolution I. 100 Units.
Canalization, a unifying biological principle first enunciated by Conrad Waddington in 1942, is an idea that has had tremendous intellectual influence on developmental biology, evolutionary biology, and mathematics. In this course we will explore canalization in all three contexts through extensive reading and discussion of both the classic and modern primary literature. We intend this exploration to raise new research problems which can be evaluated for further understanding. We encourage participants to present new ideas in this area for comment and discussion.
Instructor(s): M. Long, J. Reinitz Terms Offered: Autumn
Equivalent Course(s): ECEV 35901, STAT 35410

EVOL 36700. Morphometrics. 100 Units.
This graduate-level course serves as an introduction to the field of morphometrics (the analysis of organismal shape). Quantitative exploratory and confirmatory techniques involving both traditional (length-based) and geometric (landmark-based) summaries of organismal shape are introduced in a series of lectures and practical exercises. Emphasis is placed on the application of morphometric methods to issues such as (but not restricted to) quantification of intraspecific variability, interspecific differences, disparity, ontogenetic growth patterns (allometry), and phylogenetic changes in morphology. Relevant statistical and algebraic operations are explained assuming no prior background. Students are required to bring personal laptop computers, and are expected to acquire and analyze their own data sets during the course. (L)
Instructor(s): M. Webster Terms Offered: Winter
Equivalent Course(s): GEOS 36000

EVOL 37300. Primate Behavior and Ecology. 100 Units.
This course explores the behavior and ecology of nonhuman primates with emphasis on their natural history and evolution. Specific topics include methods for the study of primate behavior, history of primate behavior research, socioecology, foraging, predation, affiliation, aggression, mating, parenting, development, communication, cognition, and evolution of human behavior.
Instructor(s): D. Maestripieri Terms Offered: Autumn
Prerequisite(s): Completion of the first three quarters of a Biological Sciences fundamentals sequence.
Note(s): E.
Equivalent Course(s): CHDV 34300, BIOS 23248, CHDV 21800

EVOL 37500. Sexual Selection. 100 Units.
A discussion and critical analysis of sexual selection. The course will consist of lectures, reading and discussion.
Instructor(s): S. Pruett-Jones Terms Offered: Winter
Prerequisite(s): Common Core Biology, BIOS 248, or consent of instructor.
Equivalent Course(s): CHDV 37501, ECEV 37500

EVOL 38500. Color in Nature. 100 Units.
Explanations for the diversity of colors in nature are one of the most elusive and outstanding problems in evolutionary biology. In this course, we will combine advances in understanding of color perception and color production, including the basics of the physics of light, with evolutionary models of social and sexual selection. We will emphasize Endler's sensory drive, which attempts to build a predictive model of what color an organism should display based on the environment it lives in, and its neurobiological make-up. Our examples will be largely drawn from vertebrates, but we will touch on invertebrates and plants. The course will consist of a mix of lectures (some from invited outside speakers) and discussion.
Instructor(s): Trevor Price Terms Offered: Autumn. offered in alternate (odd) years
Note(s): This is a graduate level course. Undergraduates admitted by consent-only.
Equivalent Course(s): ECEV 38500

EVOL 38800. Introduction to Research at the Field Museum. 100 Units.
Introduction to Research at the Field Museum and the University of Chicago. Restricted to 1st-year Evolutionary Biology Ph.D. students. This course meets once every two weeks for a lecture by a curator at the Field Museum. A different curator lectures each week, presenting results of her/his current research on a range of topics in evolutionary biology, including phylogenetic systematics, molecular biology, paleontology, development, conservation biology and biodiversity, population biology, or biomechanics. Lectures often are followed by a tour of one of the major natural history collections in the world of living or fossil birds, mammals, plants, insects, fishes, invertebrates, or amphibians and reptiles.
Instructor(s): S. Hackett Terms Offered: Autumn
Prerequisite(s): Must be a 1st-year doctoral student in the Evolutionary Biology training program.

EVOL 40100. Grants, Publications, and Professional Issues. 100 Units.
Covers professional topics in evolutionary biology, primarily strategies in grant writing and review. Each student will work towards the submission of an application of their choice. The course meets weekly and involves extensive writing and discussion.
Instructor(s): S. Allesina, R. Ho, T. Wootton Terms Offered: TBD
Note(s): Open to first and second year graduate students in the Darwinian Sciences Cluster
Equivalent Course(s): ECEV 40100, ORGB 40101

EVOL 40200. Advanced Topics in Ethics for the Darwinian Sciences. 100 Units.
This course covers advanced topics in ethics relevant to senior Ph.D. candidates in the Darwinian Sciences. CEB students are required to successfully complete this course before being awarded the Ph.D.
Instructor(s): M. Coates, S. Hackett Terms Offered: Winter. offered in alternate years (even)
Prerequisite(s): Open to Ph.D. candidates in the Darwinian Sciences
Equivalent Course(s): ORGB 40200, ECEV 40200

EVOL 41500. Topics in Stratigraphy and Biosedimentology. 100 Units.
Seminar course using the primary literature and/or a field problem. Topic selected from the rapidly evolving fields of sequence stratigraphy, basin analysis, and animal sediment relationships.
Instructor(s): S. Kidwell Terms Offered: Spring
Equivalent Course(s): GEOS 38400

EVOL 41920. The Evolution of Language. 100 Units.
This course is designed to review critically some of the literature on the phylogenetic emergence of Language, in order to determine which questions have been central to the subject matter, which ones have recurred the most, and to what extent the answers to these are now better informed. The class will also review new questions such as the following: What is the probable time of the emergence of modern language(s)? Should we speak of the emergence of Language or of languages, in the plural?
Instructor(s): Salikoko Mufwene Terms Offered: Winter
Equivalent Course(s): LING 21920, PSYC 41920, LING 41920, ANTH 47305, CHDV 21920, CHDV 41920, COGS 22007, CHSS 41920

EVOL 42600. Community Ecology. 100 Units.
Lectures and readings cover advanced topics in multi-species systems, and include an introduction to basic theoretical approaches.
Instructor(s): J.T. Wootton Terms Offered: Autumn
Equivalent Course(s): ECEV 42600

EVOL 42800. Population Ecology. 100 Units.
A lecture course on the empirical and theoretical approaches to the study of natural populations, including field methodologies and quantitative approaches. Includes computer assignments.
Instructor(s): C. Pfister Terms Offered: Winter
Equivalent Course(s): ECEV 42800

EVOL 44002. Molecular Evolution II: Genes and Genomes. 100 Units.
This course covers the knowledge and well-established evolutionary analyses of genes and genomes, as well as related areas (e.g., origination and evolution of new genes, exon-intron structure, sex-related genes, sex-determination genetic systems, transposable elements, gene regulation systems, duplication of genes and genomes, evolution of genome sizes). These topics are discussed under the processes driven by various

evolutionary forces and genetic mechanisms. The analysis of these problems is conducted with the genomic context. Lectures, discussions, and experiments are combined.
Instructor(s): M. Long Terms Offered: Spring. This course is offered in alternate (odd) years.
Prerequisite(s): BIOS 23258 or consent of instructor
Equivalent Course(s): BIOS 23259, ECEV 44002

EVOL 45500. Biogeography. 100 Units.
In this course, we examine the uneven distribution of life on Earth and how ecology, evolution, and Earth sciences help us understand its past, present, and future. Topics include diversity gradients and hotspots, islands, methods for inferring the boundaries and histories of biotas, models and laws in biogeography, and the relevance of biogeography in the Anthropocene.
Instructor(s): J. Bates (odd years); R. Ree (even years) Terms Offered: Autumn
Prerequisite(s): Three quarters of a Biological Sciences Fundamentals sequence and a course in either ecology, evolution, or earth history; or consent of instructor
Note(s): E. GP.
Equivalent Course(s): BIOS 23406, ENST 25500, GEOG 25500, GEOG 35500

EVOL 46700. Advanced Topics in Behavioral Ecology. 100 Units.
This is a reading course covering advanced topics in behavioral ecology. The list of topics to be covered will be based in part on student interests, but may include: behavior and conservation, communication, mating systems, sexual conflict, and sperm competition. This course is designed as a graduate course, but advanced undergraduates may enroll with the permission of the instructor.
Instructor(s): S. Pruett-Jones, T. Price Terms Offered: Winter
Equivalent Course(s): ECEV 36700

EVOL 49401. Approaches to Teaching in The Darwinian Sciences. 100 Units.
This course will introduce different teaching philosophies and methods that address how to be an effective teacher in the Darwinian Sciences. Specifically, the course will address what skills and knowledge undergraduates need to acquire and which assignments best teach these skills. Students will prepare course syllabi, discuss different approaches to teaching, and draft a philosophy of teaching statement. The overall goal for the course is that the students think critically about the art of teaching and formulate their own thoughts on the matter to better prepare them for their own careers in teaching.
Equivalent Course(s): ECEV 49401, ORGB 49401

EVOL 49500. Teaching in Evolutionary Biology. 100 Units.
Under the supervision of University faculty, graduate students in the Evolutionary Biology may serve as teaching assistants for courses in the College and relevant Graduate Divisions. Students will be evaluated and mentored throughout the quarter by their faculty supervisor, and at the end of the quarter by enrolled students. Students must choose the instructor name from the faculty listing in the Time Schedules and register using that instructor's assigned section number.
Instructor(s): Staff
Prerequisite(s): successful fulfillment of the BSD teaching requirement and consent of instructor.

EVOL 49600. Graduate Readings in Evolutionary Biology at the Field Museum. 300.00 Units.
Directed individual reading courses supervised by CEB faculty members who are curators at the Field Museum. Students must choose the instructor name from the faculty listing in the Time Schedules and register using that instructor's assigned section number.
Instructor(s): Staff
Prerequisite(s): Consent of instructor.

EVOL 49700. Graduate Readings in Evolutionary Biology. 300.00 Units.
Directed individual reading courses in evolutionary biology supervised by CEB faculty members. Students must choose the instructor name from the faculty listing in the Time Schedules and register using that instructor's assigned section number.
Instructor(s): Staff.
Prerequisite(s): consent of instructor.

EVOL 49800. Off-Campus Grad Rsch: Evolution. 300.00 Units.
Advanced research under the direction of the faculty of the Committee on Evolutionary Biology, undertaken away from the University of Chicago campus at the Field Museum, the Chicago Zoological Park, Lincoln Park Zoo, established biological field stations under the direction of their staffs, or other locations approved by the Chair and the student's advisory committee. Students must choose the instructor name from the faculty listing in the Time Schedules and register using that instructor's assigned section number.
Instructor(s): Staff
Prerequisite(s): Consent of Instructor

EVOL 49900. Graduate Research - On Campus. 300.00 Units.
Advanced research under the direction of the faculty of the Committee on Evolutionary Biology. While any approved research problem may be pursued under this course number, special attention is called to the following research fields available in the Committee: population ecology and genetics, entomology, applied ecology, plant biology, systematics of fossil invertebrates, molluscs, problems in the systematics of arthropods, herpetology,

mammalogy, ornithology, and ichthyology, theoretical biology, animal behavior, paleoecology, molecular evolution, functional morphology, evolution of development, community ecology and evolution, evolutionary paleobiology and macroevolution, and physiological ecology. Students must choose the instructor name from the faculty listing in the Time Schedules and register using that instructor's assigned section number.
Instructor(s): Staff
Prerequisite(s): Consent of Instructor

EVOL 70000. Advanced Study: Evolutionary Biology. 300.00 Units.
Advanced Study: Evolutionary Biology