

Ecology and Evolutionary Biology

Office: 400 Lindy Boggs Center
Phone: (504) 865-5191
Fax: (504) 862-8706
Website: www.eebio.tulane.edu

Professors

Henry L. Bart, Ph.D., Oklahoma
Steven P. Darwin, Ph.D., Massachusetts
David C. Heins, Ph.D., Tulane (Chair)
Thomas W. Sherry, Ph.D., California, Los Angeles

Associate Professors

Jeffrey Q. Chambers, Ph.D., California, Santa Barbara

Assistant Professors

Michael J. Blum, Ph.D., Duke
Jordan Karubian, Ph.D., Chicago
Corinne L. Richards-Zawacki, Ph.D., Michigan
Caroline M. Taylor, Ph.D., California, Davis

Professor of the Practice

John H. Caruso, Ph.D., Tulane

Emeritus

Stuart S. Bamforth, Ph.D., Pennsylvania
Milton Fingerman, Ph.D., Northwestern

ECOLOGY AND EVOLUTIONARY BIOLOGY MAJOR

The major in ecology and evolutionary biology provides understanding of the structure and function of organisms and their evolution and ecology. Majors must complete a minimum of 38-39 credits comprising five core courses, five elective courses of three to four credits each, and the capstone requirement. The core courses are EBIO 101/111 and CELL 101 for a total of seven credits, EBIO 308 and CELL 205 for three credits each, and EBIO 304/314 for four credits. Elective courses are selected according to the interests of the student in consultation with the major advisor. Two of the electives must be designated laboratory or field courses. A maximum of one course representing a special project, independent study, or honors thesis may be counted as an elective, but not as a laboratory-field course. In addition, a student may use a maximum of one course from an approved list of courses from other departments as an elective course. Courses representing internship studies and seminars may not count as elective courses. The capstone requirement is EBIO 497-498 Contemporary Ecology and Evolutionary Biology; EBIO H500 Honors Thesis may be substituted for EBIO

498 in the spring semester. Majors are also required to complete two semesters of mathematics and four semesters of chemistry, including two semesters of general chemistry 107/117, 108/118, or H109/H111, H110/H112 and two semesters of organic chemistry 241/243, 242/244 or H245/H247, H246/H248. Additional courses in biological statistics and physics are also highly recommended.

ENVIRONMENTAL BIOLOGY MAJOR

The major in environmental biology provides understanding of biological processes among populations, communities, and ecosystems. Majors must complete seven core courses totaling 23 credits, three elective courses totaling 11 credits, and the capstone requirement for a combined total of 38-39 credits. All students majoring in environmental biology complete core courses including EBIO 101/111 Diversity of Life, CELL 101 General Biology, CELL 205 Genetics, EBIO 308 Processes of Evolution, EBIO 304/314 Ecology, EBIO 204 Conservation Biology, and EBIO 205 Global Change Biology. Elective courses in the department of ecology and evolutionary biology must include two laboratory-field courses. A maximum of one elective course may be chosen from among EBIO 491, 492, 495, 496, 499, or 500. The capstone requirement is EBIO 497-498 Contemporary Ecology and Evolutionary Biology; EBIO H500 Honors Thesis may be substituted for EBIO 498 in the spring semester. Majors are also required to complete two semesters of mathematics, two semesters of general chemistry with labs (CHEM 107/117 and 108/118 or H109/H111 and H110/H112, and either environmental chemistry or the first semester of organic chemistry with lab (CHEM 241/243 OR H245/H247. Courses in statistics and physics are highly recommended but are not required.

ECOLOGY AND EVOLUTIONARY BIOLOGY MINOR

Students who minor in ecology and evolutionary biology complete EBIO 101/111 and CELL 101 for seven credits, EBIO 308 for three credits, EBIO 304/314 for four credits, and two additional elective courses of three or four credits each in ecology and evolutionary biology for a minimum of 21 credits. One of the two elective courses must be a designated laboratory or field course. Courses from other departments may not be used as electives for the minor. In addition, courses representing special projects, independent studies, honors theses, internship studies, and seminars cannot be used to satisfy elective requirements. Because of the interdisciplinary nature of the biological chemistry major, students in that program may not minor in ecology and evolutionary biology.

MARINE BIOLOGY MINOR FOR MAJORS

Students majoring in ecology & evolutionary biology or environmental biology who minor in marine biology will complete a minimum of 16 credits beyond the departmental major, including EBIO 210 for three credits, EBIO 223 for three credits, EBIO 425 for four credits, and two summer courses for no less than three credits each at an approved marine field station. Neither EBIO 210, EBIO 223, nor EBIO 425 may be counted toward both the major and the minor.

MARINE BIOLOGY MINOR FOR NON-MAJORS

Students majoring in departments other than ecology and evolutionary biology who minor in marine biology complete a minimum of 23 credits, including CELL 101 and EBIO 101/111 for a total of seven credits, EBIO 308 for three credits, EBIO 304/314 for four credits, EBIO 210 for three credits, and either EBIO 223 for three credits or EBIO 425 for four credits. In addition, students complete one summer course for no less than three credits at an approved marine field station.

COURSES SUITABLE FOR NON-SCIENTISTS

The department offers a number of courses that are appropriate for satisfying the science distribution requirements, including the laboratory course requirement. There are no prerequisites for these courses.

Lecture Courses

EBIO 104 Global Environmental Change
EBIO 123 Diversity in Animal Behavior
EBIO 201 Evolution in Human Health and Disease
EBIO 203 History of Life
EBIO 211 Tropical Biology
EBIO 221 Insect Biology
EBIO 233 Natural History of Louisiana
EBIO 377 Mississippi River Colloquium

Courses Fulfilling Laboratory Course Requirement in the Core Curriculum

EBIO 101/EBIO 111 Diversity of Life/Laboratory
EBIO 318/EBIO 319 Plants and Human Affairs/Laboratory
EBIO 333/334 Human Physiology/Mammalian Anatomy and Histology
Laboratory
EBIO 431 Plant Systematics

COURSE PREREQUISITES

The courses EBIO 101 and 111 and CELL 101 are prerequisites for all courses above the 100 level, except where stated otherwise in course descriptions. Any other prerequisites or corequisites are also listed in the course descriptions.

HONORS COURSES

EBIO H104 Global Environmental Change (3)

Staff. An introduction to the physical and biological processes that regulate the function of the Earth system. The composition, formation, and stabilization of the Earth's atmosphere and ecosystem will be examined, emphasizing biological processes and ecosystem ecology. With an understanding of the historical rates and mechanisms of natural global change, the means by which human activities alter Earth system function at local to global scales will be explored, along with the consequences of and solutions to human-induced global change. This course

meets the college non-laboratory science requirement, but it cannot count toward any major or minor requirements in ecology and evolutionary biology. Students may receive credit for only one of EBIO 104, 105, or 205.

EBIO H499-H500 Honors Thesis (3, 4)

Staff. For especially qualified juniors and seniors with approval of department and the Honors Committee.

FRESHMAN INTRODUCTORY COURSES

EBIO 101 Diversity of Life (3)

Staff. Corequisite: EBIO 111. A survey of plant and animal life emphasizing the diversity among individuals, population, species, communities, and ecosystems.

EBIO 104 Global Environmental Change (3)

Staff. An introduction to the physical and biological processes that regulate the function of the Earth system. The composition, formation, and stabilization of the Earth's atmosphere and ecosystem will be examined, emphasizing biological processes and ecosystem ecology. With an understanding of the historical rates and mechanisms of natural global change, the means by which human activities alter Earth system function at local to global scales will be explored, along with the consequences of and solutions to human-induced global change. This course meets the college non-laboratory science requirement, but it cannot count toward any major or minor requirements in ecology and evolutionary biology. Students may receive credit for only one of EBIO 104, 105, or 205.

EBIO 111 Diversity of Life Laboratory (1)

Staff. Corequisite: EBIO 101. Laboratory and field exercises designed to augment the lecture material in 101. Three hours per week.

EBIO 123 Diversity in Animal Behavior (3)

Staff. Basic concepts in animal behavior, emphasizing diversity among animals and their behaviors and the ecological and evolutionary influences on those behaviors. Course will include discussion of how behaviors are studied, physiological mechanisms of behaviors, animal diversity, and how animals communicate, find mates, reproduce, care for their young, defend and feed themselves and move within their environment. Meets the college non-laboratory science requirement. Does not count toward the requirements for a major or minor in ecology and evolutionary biology.

LECTURE COURSES

EBIO 201 Evolution in Human Health and Disease (3)

Prof. Heins. An introduction to the study of infectious and non-infectious human diseases from an evolutionary perspective.

EBIO 203 History of Life (3)

Staff. A multidisciplinary introduction for majors and non-majors to the evolution of life on Earth, from its origin through the Pleistocene. The course will focus on

the evolution and ecology of organisms in primitive environments, with special attention given to key taxa and events, such as the transition to land, the origin of angiosperms, the rise and fall of dinosaurs, and the origin and early evolution of reptiles, birds, and mammals. Emphasis will be placed on the reconstruction of ancient environments, using modern ecological and evolutionary principles as a guideline to the nature of early biological communities and ecosystems. Same as EENS 203.

EBIO 204 Conservation of Biological Diversity (3)

Prof. Sherry. Corequisite or Optional: EBIO 289 (1) Service Learning for a minimum of 40 hours. A consideration of biological diversity and its persistence, threats, human value, conservation efforts, and biological bases. Specific topics include extinction, global change, population viability, habitat loss and degradation, ecosystem management, restoration, agricultural ecosystems, economic and legal considerations, and the human population.

EBIO 205 Global Change Biology (3)

Prof. Chambers. This course explores the biological basis of environmental issues and the changes occurring at a global scale, divided approximately into halves. The first half will provide a strong foundation in the interactions among biological and physical systems. The second half will be devoted to specific issues including global climate change, atmospheric pollution, community stability, habitat fragmentation, and loss of biodiversity. Changes that have occurred over geological time will be compared with changes in the modern industrial era. Students may receive credit for only one EBIO 104, 105, or 205.

EBIO 206 Case Studies in Environmental Science (3)

Staff. This course uses case studies to introduce students to interdisciplinary aspects of environmental issues. Emphasis is placed on environmental topics along the Gulf Coast region; past topics have included wetland loss, mercury contamination, and hypoxia events in Louisiana coastal waters.

EBIO 210 Marine Biology (3)

Prof. Caruso. Prerequisites: EBIO 101, 111. A systematic treatment of the organisms and habitat in the marine environment.

EBIO 211 Tropical Biology (3)

Staff. Prerequisite: none. Introduction to ecological, evolutionary, and organismal studies of living organisms in the neotropics.

EBIO 212 Climate Change, Biodiversity, and Tropical Forests (3)

Staff. This course is offered as part of the Stone Center for Latin American Studies' Summer in Costa Rica Program. Students may not register on-line for this course; they must register directly with the Stone Center Summer Program office. The course will introduce students to the structure and ecology of tropical forests. Students will be expected to integrate what they learn about the real social and economic causes of deforestation and grass roots efforts to revert it with the social, political, economic and biological logic of world climate change agreements and disagreements.

EBIO 221 Insect Biology (3)

Staff. Prerequisite: none. Basic insect biology with an emphasis on insect interactions with humans and how insects fit into our culture.

EBIO 223 Oceanography (3)

Staff. A broad survey of chemical, physical, and geological oceanography with a brief historical overview and a consideration of current concepts. Same as EENS 223.

EBIO 225 Vertebrate Biology (3)

Prof. Caruso and Prof. Heins. An introduction to vertebrate natural history, including evolution, systematics, zoogeography, population dynamics, behavior, ecology, conservation, and extinction.

EBIO 233 Natural History of Louisiana (3)

Staff. A survey of terrestrial and aquatic ecosystems of southern Louisiana. Lectures cover the ecology of regional plant and animal communities, with special emphasis on environmental issues such as invasive species, hurricane disturbance, conservation and management. The geology, geography, history, and culture that contribute to the formation and maintenance of each ecosystem will also be examined, from barrier islands to upland forests.

EBIO 260 Natural Resource Conservation Theory and Practice (3)

Prof. Bart. Corequisite: EBIO 289 Service Learning. This course examines the theory and practice of natural resource preservation in the United States, and the agencies and organizations involved in this endeavor. Students may not apply this course and EBIO 360 toward the course requirements for the EE Biology major.

EBIO 304 General Ecology (3)

Prof. Sherry. Corequisite: EBIO 314 (required only for EE Biology majors and minors). A survey of the patterns and mechanisms of interaction among all organisms and their environments, including examples of human impacts on the biosphere. Lectures plus two field trips. EBIO 314 is an optional laboratory for non EE Biology majors.

EBIO 308 Processes of Evolution (3)

Prof. Heins, Prof. Sherry. Corequisite or prerequisite: CELL 205 or approval of instructor. Patterns and processes in the evolution of species and populations, including discussions of natural selection, gene flow, genetic drift, adaptation, speciation, origins of evolutionary novelty, and selected trends in the fossil record.

EBIO 318 Plants and Human Affairs (3)

Prof. Darwin. Prerequisite: none. Since ancient times, people have relied on plants for food, clothing, shelter, medicines, and more. This course investigates some of the ways in which plants support and shape human life. Topics include: early ideas about plants and the origin of plant lore; plant domestication and the rise of agriculture; plant products in commercial economies; cultural uses of plants; plants and the future of civilization.

EBIO 333 Human Physiology (3)

Prof. Caruso. A discussion of the functional morphology and physiology of the human body from the molecular to the whole organism level.

EBIO 368 Comparative Animal Behavior (3)

Prof. Christenson. Prerequisite: EBIO 101 or PSYC 100 or 101. A lecture course to introduce the types of questions asked by animal behaviorists, theoretical disciplines posing these questions, and recent research in behavior as related to the environment, social behavior, and reproduction. Designed for PSYC and EEB majors. Same as PSYC 368.

EBIO 370 Evolution and Psychology (3)

Prof. Christensen. Prerequisites: PSYC 100, H101 or 102 or EBIO 101. Lecture course exploring human behavior and cognition from an evolutionary perspective. Topics include evolutionary mechanisms, history of evolution in psychology and the adaptive nature of sensory processes, language, social behaviors, reproduction and psychopathology. Same as PSYC 370.

EBIO 371 Historical Ecology of Amazonia (3)

Prof. Balée. Interactions between local peoples and Amazonian landscapes from prehistory to the present. Amazonian landscapes as an analytic unit will be examined from the interdisciplinary perspective of historical ecology. Changes and development of forests and savannas since the arrival of human beings. Historical, ecological, cultural forces involved in biological and edaphic diversity in modern forests. Long-term effects of prehistoric and historic human occupations and manipulation of landscapes. Implications for conservation and development. Same as EBIO 671 and ANTH 371/671.

EBIO 377 Mississippi River Colloquium (4)

Prof. Bart. Prerequisite: none. Interdisciplinary course dealing with the Mississippi River Basin. The goal is to give students a broad overview of the important social and environmental issues surrounding the river. This course meets the college non-laboratory science requirement, but it cannot count toward any major or minor in ecology and evolutionary biology. Lectures are supplemented by weekly labs, some day field trips, and one weekend field trip. Same as ENST 377.

EBIO 402 Plant Ecology (3)

Staff. Prerequisite: EBIO 304 or approval of instructor. Survey of vegetation patterns and an investigation of the mechanisms and processes that shape these patterns. Field trips or field projects required although this is not a laboratory-field course.

EBIO 405 Ecosystem Ecology (3)

Prof. Chambers. Prerequisites: EBIO 304, CHEM 241, and approval of instructor. An in depth examination of ecosystem structure and function. Emphasis will be placed on processes and how individual organisms affect processes. Human impacts on ecosystem structure and function will be considered.

EBIO 408 Biostatistics and Experimental Design (3)

Prof. Richards-Zawacki. This course will teach students how to interpret statistical data in an evolutionary and ecological context. Special emphasis will be placed on understanding the nature of ecological field experiments, and experimental design. In addition, issues regarding how ecological and evolutionary analyses are perceived in the public media will be discussed. We will cover statistical methods for dealing with such problems (regression, correlation, ANOVA, etc.), and also read papers in ecological and evolutionary journals that highlight statistical issues. The class is designed for students who have not had prior experience with statistics.

EBIO 411 Tropical Ecology (3)

Prof. Chambers. Prerequisite: EBIO 304 or approval of instructor. Advanced course focusing on terrestrial ecology covering all tropical ecosystems with an emphasis on forests. Ecological topics will be addressed at population, community, and ecosystem levels with an organismal treatment of plants, insects, birds, reptiles, fish, mammals, microbes (fungi and bacteria), and other model organisms.

EBIO 417 Speciation and Macroevolution (3)

Prof. Blum and Prof. Heins. This course will be an introduction to the primary concepts involved in macroevolution, which refers to evolutionary processes occurring at the species level and higher.

EBIO 419 Wetlands Ecology (3)

Prof. Blum. This course will introduce students to the occurrence, morphology, hydrology, soils, ecology and regulation of wetlands.

EBIO 422 Advanced Oceanography (3)

Staff. A broad survey of biological, chemical, physical, and geological oceanography with a brief historical overview and consideration of current concepts. There will also be an examination of biogeochemical relationships at macroscales, mesoscales, and microscales in the ocean. Same as EENS 422.

EBIO 423 Molecular Evolution and Ecology (3)

Prof. Blum. Molecular ecology employs principles of population genetics and phylogenetics to answer questions about organismal diversity, population dynamics, community assembly and macroecology. Having a foundation in molecular evolution and genomics allows for broad topical applications, including the study of infectious diseases, conservation of endangered species, organismal responses to global environmental change, and the evolutionary origins of biological diversity. Students will first learn the principles of molecular evolution, after which they will be introduced to the core techniques used to generate molecular data. Students will learn how molecular data can be developed and analyzed to address questions in ecology and evolutionary biology.

EBIO 424 Host-Parasite Systems (3)

Prof. Heins. Study and discussion of the ecology and evolution of host-parasite systems emphasizing patterns and processes.

EBIO 426 Biodiversity and Environmental Informatics (3)

Prof. Bart. Prerequisites: CELL 205 and EBIO 308. This upper-level course explores theory and practice in biodiversity informatics, an emerging field of cyber-enabled discovery and innovation. Topics to be discussed include natural history collection databases and networks, data mining, morphological databases and ontology, digital libraries, phyloinformatics, cybertaxonomy, Georeferencing methods and algorithms, GIS and predictive niche modeling. A computer laboratory is a required corequisite. No prerequisites.

EBIO 427 Population Ecology (3)

Prof. Sherry. Prerequisite: EBIO 304 or approval of instructor. Principles of population dynamics in space and time, population regulation, and population interactions as determined from an integrated study of plants and animals, followed by exploration of the applicability of these principles to an understanding of the contemporary growth and control of the human population.

EBIO 452 Ecological Physiology (3)

Staff. An introduction to the physiological adaptations of plant and animals via study of the interactions between organisms and their environment. The course will focus on animals, but will include examples of plants. An explicitly evolutionary and quantitative perspective will be used. The primary purpose is to provide a general introduction to the field of physiological ecology, including an overview of the field, with an emphasis on recent studies and new techniques in the field. A historical view of the origins of physiological ecology will also be covered.

EBIO 453 Comparative Animal Physiology (3)

Staff. Discussions and readings on selected topics in comparative animal physiology. The different ways diverse organisms perform similar functions are explored.

EBIO 466 Topics in Biology (1-3)

Staff. Courses offered for undergraduate students by visiting professors and permanent faculty. Consult department for specific description.

EBIO 470 Seminar in Evolution of Reproductive Strategies (3)

Prof. Christenson. Prerequisites: EBIO 368 or PSYC 368, and approval of instructor. Discussion of the evolution and ecology of reproductive strategies. Topics include costs and benefits of sexual reproduction, sexual selection, sperm competition and mating systems. Same as PSYC 470.

EBIO 493 Capstone Independent Study (3-4)

Staff. Prerequisite: EBIO 304/314, 308, and senior standing or approval of the instructor. A senior capstone experience for departmental majors unable to complete EBIO 497/498 due to extenuating circumstances. Under faculty supervision, students select a topic in ecology and evolutionary biology, write an expository paper on that topic and give an oral presentation of their findings. Students also attend departmental research seminars and meet to discuss contemporary issues in ecology and evolutionary biology.

EBIO 497, 498 Contemporary Ecology and Evolutionary Biology (1,3)

Staff. Prerequisite: EBIO 304/314, 308, and senior standing or approval of the instructor. This is the senior capstone experience for departmental majors. Under faculty supervision, students select a research topic in ecology and evolutionary biology, write an expository paper on that topic, and give an oral presentation of their findings. Students also attend departmental research seminars and meet to discuss contemporary issues in ecology and evolutionary biology. EBIO 497-498 are required of all departmental majors, and both courses must be completed to receive credit for the capstone experience. EBIO H500 Honors Thesis may be substituted for or taken in addition to EBIO 498 in the spring semester.

LABORATORY-FIELD COURSES

EBIO 314 General Ecology Laboratory (1)

Prof. Sherry. Corequisite: EBIO 304. Quantitative laboratory and field exercises designed to augment the lecture material. Includes data collection, sampling, experimentation, statistical hypothesis testing, modeling, discussion of research results, and writing up of results in the form of three scientific papers.

EBIO 319 Plants and Human Affairs Laboratory (1)

Prof. Darwin. Prerequisite: none. Corequisite: EBIO 318. Laboratory course to accompany EBIO 318. A survey of plant products and their sources, emphasizing the structure, chemistry, and diversity of economic plants. Demonstrations, exercises, and field trips.

EBIO 334 Mammalian Anatomy and Histology Laboratory (1)

Prof. Caruso. Prerequisite/Corequisite EBIO 333. A detailed laboratory examination of the histological and anatomical structure of the principal tissues, organs and organ systems of mammals.

EBIO 406 Stream Ecology (4)

Prof. Bart. Ecology of freshwater stream environments, including physical forces influencing water flow, sediment and solute geochemistry, and composition and interactions of stream biota. Lectures supplemented by weekly labs, some day field trips, and one weekend field trip.

EBIO 410 Introduction to Marine Zoology (4)

Staff. Prerequisite: approval of instructor. Field and laboratory survey of marine animals, particularly those of the Louisiana Gulf Coast, including classification, morphology, physiology, and ecology. Offered summers only. Four weeks at a Louisiana Universities Marine Consortium coastal laboratory.

EBIO 420 Ornithology (4)

Prof. Sherry. An introduction to the biology of birds emphasizing their origin, evolution, diversity, zoogeography, functional morphology, behavior, ecology, and conservation. Lectures supplemented by weekly laboratories or short field trips, and occasional weekend field trips. Students must provide own binoculars.

EBIO 421 Vertebrate Morphology (4)

Prof. Bart. Comparative morphology, evolution, and bionomics of representative vertebrates. Lectures supplemented by weekly labs.

EBIO 425 Biology of Invertebrates (4)

Prof. Caruso. Biology, taxonomy and distribution of the invertebrates with emphasis on the local fauna. Lectures, laboratories, and field trips.

EBIO 428 Ichthyology (4)

Prof. Bart. Biology of fish-like vertebrates, including taxonomy, evolution, anatomy, physiology, and biogeography. Lectures supplemented by weekly labs, some day field trips, and one weekend field trip.

EBIO 431 Plant Systematics (4)

Prof. Darwin. Prerequisite: none. A review of the structure and evolution of land plants and a survey of the major families of flowering plants. Laboratory emphasis on structural terminology and plant identification. Field trips required.

EBIO 433 Entomology (4)

Staff. Insect classification and evolution, structure and function, and ecology. Insect collection required. Lectures supplemented by weekly labs.

SPECIAL COURSES

EBIO 289 Service Learning (1)

Staff. Prerequisite: approval of department. Students complete a service activity in the community in conjunction with the content of a three-credit corequisite course.

EBIO 389 Service Learning (1)

Staff. Prerequisite: approval of department. Students complete a service activity in the community in conjunction with the content of a three-credit corequisite course.

EBIO 456, 457 Internship Studies (1-3, 1-3)

Staff. Prerequisite: approval of department. An experiential learning process coupled with pertinent academic course work. Open only to juniors and seniors in good standing. Registration is completed in the academic department sponsoring the internship on TUTOR. (Note: A maximum of six credits may be earned in one or two courses.)

EBIO 467 Topics in Marine Science (3)

Staff. Advanced lecture, laboratory, and field work on a selected topic in the marine sciences at a coastal laboratory of the Louisiana Universities Marine Consortium. By arrangement.

EBIO 468 Special Topics in Marine Science (3)

Staff. Directed undergraduate research study at a coastal laboratory of the Louisiana Universities Marine Consortium by arrangement.

EBIO 491, 492 Independent Studies (1-3, 1-3)

Staff. Laboratory or library research under direction of a faculty member.

EBIO 495, 496 Special Projects in Biology (1-3, 1-3)

Staff. Individual studies in a selected field. Open to qualified juniors and seniors with approval of instructor and advisor.

ADVANCED UNDERGRADUATE AND GRADUATE COURSES

EBIO 604 Marine Ecology (3)

Staff. Relationship of marine and estuarine organisms to environmental factors; interactions among organisms; ecological processes of energy and material flow; communities and ecosystems of the Gulf Coast. One weekend field trip required although this is not a laboratory-field course.

EBIO 607 Restoration Ecology (3)

Staff. Prerequisite: EBIO 304 or approval of instructor. Discussion will focus on applying knowledge from ecology toward understanding how damaged ecosystems differ from relatively undisturbed systems, evaluating ecosystem health and designing plans to restore system integrity.

EBIO 608 Phylogenetics (3)

Prof. Darwin. Prerequisite: approval of instructor. A consideration of biological homology, species definition, problems of character data analysis, and Hennigian cladistics as a means of reconstructing the evolutionary history of life. The implications of phylogenetic hypotheses for biological classification, biogeography, paleontology, comparative ecology, and conservation biology. Seminars, readings, and projects.

EBIO 609 Invertebrate Paleontology (4)

Prof. Parsley. Prerequisite: EENS 112, or approval of instructor. Principles of invertebrate paleontology; a systematic treatment of the fossil invertebrates and their living relatives. Emphasis on functional morphology, ontogeny, and paleontology. Lectures are supplemented by weekly labs. Same as EENS 609.

EBIO 610 Micropaleontology (3)

Staff. Prerequisite: EBIO 101 or EENS 112. The foraminifera, ostracoda, nannofossils, conodonts, and other groups of microfossils. Same as EENS 610.

EBIO 613 Principles of Paleobiology (3)

Staff. Prerequisite: EBIO 101, EENS 112, EENS 609, or approval of instructor. Selected topics on macroevolutionary theories; Phylogeny and the fossil records of metazoans; Major events in the history of life; Patterns of biodiversity through geological time; Taphonomy; Paleoecology. Same as EENS 613.

EBIO 616 Morphology and Evolution of Vascular Plants (3)

Prof. Darwin. Prerequisite: EBIO 431, or approval of instructor. The evolutionary history of land plants, emphasizing their structural homologies and paleobotany.

EBIO 617 Marine Invertebrate Zoology (4)

Staff. Prerequisite: Approval of instructor. General study of the classification, structure, function, and ecology of marine and estuarine invertebrates emphasizing field studies on the Louisiana Gulf Coast. Offered summers only. Four weeks at a Louisiana Universities Marine Consortium coastal laboratory.

EBIO 619 Darwin and Darwinism (4)

Prof. Darwin. Prerequisite: approval of instructor. A consideration of Charles Darwin's theory of Natural Selection, including the history of evolutionary thought before Darwin's time, the circumstances surrounding Darwin's research,

and the effect of Darwin's ideas on the development of contemporary biology. Readings, discussions, and written assignments. Satisfies the LAS writing requirement.

EBIO 621 Global Biogeochemical Cycles (3)

Staff. Prerequisite: one year of Organic Chemistry. An introduction to the global biogeochemical cycles in fresh water, marine, and terrestrial ecosystems. Emphasis will be placed on key environmental issues as they relate to perturbations of these global cycles. Open only to seniors and graduate students. Same as EENS 621.

EBIO 623 Biogeography (3)

Prof. Darwin. Prerequisite: EBIO 308, 304, or approval of instructor. An investigation of the past and present geographical distribution of plants and animals, with consideration of current biogeographical theory.

EBIO 624 Biology of Fishes (4)

Prof. Heins. Physiology, life history, systematics, ecology, and behavior of the major groups of fishes. Lectures, laboratory, and field trips.

EBIO 625 Isotopes in the Environment (3)

Prof. Rosenheim. The use of isotopes as tools to trace the movement of air, water, and sediments through the atmosphere, hydrosphere, biosphere, and lithosphere. Same as EENS 625.

EBIO 626 Paleoclimatology (3)

Prof. Törnqvist Prerequisite: approval of instructor. Understanding past climatic variation is necessary to fully comprehend present and model future climate. The focus will be on climate change during the late Quaternary Period, with special emphasis on climate reconstruction methods. Same as EENS 626.

EBIO 630 Marine Vertebrate Zoology (4)

Staff. Prerequisite: 16 credits of EBIO or approval of instructor. General study of the marine chordates with particular emphasis on the fishes, including classification, structure, function, and ecology. Offered summers only. Four weeks at a Louisiana Universities Marine Consortium laboratory.

EBIO 633 Plant-Animal Interactions (3)

Staff. Prerequisite: EBIO 304. Ecological, evolutionary, and applied approaches to the studies of herbivory, ant-plant interactions, pollination, and seed dispersal.

EBIO 634 Ecological Analysis (3)

Staff. Prerequisite: EBIO 408. Study of powerful methods for designing ecological studies and analyzing ecological data, assuming a knowledge of basic parametric and nonparametric statistics.

EBIO 659 Limnology (3)

Staff. Biological, chemical, and physical characteristics of the inland aquatic environment.

EBIO 666 Special Topics in Biology (1-3)

Staff. Courses offered by visiting professors or permanent faculty. For description, consult department.

EBIO 667 Ecology of Fishes (3)

Prof. Heins. The study of topics and issues in fish ecology in relationship to general ecological and evolutionary theory. Emphasis will be placed on research in community and evolutionary ecology and the historical background from which it developed.

EBIO 669 Biochemistry of Estuaries (3)

Staff. Prerequisites: CHEM 242, and MATH 122 or 131. Physico-chemical and biological aspects of the zone interfacing fresh water and marine environments. Emphasis will be placed on the biogeochemical cycles of this highly dynamic ecosystem. Field trips to estuarine regions along the Gulf Coast will be required although this is not a laboratory-field course. Same as EENS 669.

EBIO 671 Historical Ecology of Amazonia (3)

See EBIO 371 for course description.

EBIO 681 Journal Review in Ecology and Evolutionary Biology (1)

Staff. Prerequisite: graduate standing or approval of instructor. Discussion of significant new publications in ecology, evolutionary biology, and related fields.

EBIO 685 Current Topics in Ecology and Evolutionary Biology (2)

Staff. Prerequisite: graduate standing or approval of instructor. In-depth examination of a selected topic in ecology and evolutionary biology.

EBIO 691, 692 Independent Studies (1-4, 1-4)

Staff. Prerequisite: junior or senior standing and approval of instructor. Advanced independent studies in a selected field of biology.

INTERDEPARTMENTAL COURSES

Any one of these courses, which are not taught by the faculty of the Department of Ecology and Evolutionary Biology, is acceptable as one of the electives in the required program for the Ecology and Evolutionary Biology major.

ANTH 314 Primate Behavior and Ecology

ANTH 650 Human Evolution

CELL 301/302 Cell Biology/Laboratory

CELL 311/312 Molecular Biology/Laboratory

CELL 401 Cellular Biochemistry

CELL 411 Cells and Tissues

CELL 413 Embryology

CELL 416 Developmental Biology

CELL 422 Microbiology

CHEM 250 Environmental Chemistry

CHEM 383 Introduction to Biochemistry

CHEM 385 Introduction to Biochemistry Laboratory