DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY

Programs

Mission Statement

The Department of Ecology and Evolutionary Biology is committed to excellence in teaching, research and service to our communities. We strive to integrate our scientific and educational missions in ecology and evolutionary biology by discovering new knowledge through programmatic research and by providing a rich learning environment for undergraduate and graduate students. We prepare our students for a wide range of disciplines, from biology, environmental science, and conservation to law, medicine, and public health; and for both the creation and dissemination of knowledge.

Our teaching and research includes genomes, organisms, populations, communities, ecosystems, and global systems as we focus our efforts on conservation biology, ecosystem ecology, environmental biology, evolutionary biology, systematics, tropical ecology, disease ecology, and global change, including climate change. We emphasize tropical biology, wetlands and coastal ecosystems, and global change biology centered geographically, but not exclusively in the subtropics — especially Louisiana — and the American tropics.

Achieving our scientific mission is predicated on fostering an environment that provides opportunities for achieving academic excellence to all. We embrace proactive policies including ongoing training, communication about funding opportunities, and equal-opportunity hiring and recruiting practices. Our efforts are integral to the success of the EEB department, The School of Science and Engineering and Tulane University, and to our various academic disciplines.

Undergraduate

Majors

- Ecology and Evolutionary Biology Major (https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/ecology-evolutionary-biology-major/)
- Environmental Biology Major (https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/environmental-biology-major/)

Minors

- Ecology and Evolutionary Biology Minor (https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/ecology-and-evolutionary-biology-minor/)
- Marine Biology Minor for Biology Majors (https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/marine-biology-minor-biology-majors/)
- Marine Biology Minor for Non-Biology Majors (https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/marine-biology-minor-non-biology-majors/)

Graduate

- Ecology and Evolutionary Biology, MS (https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/ecology-evolutionary-biology-ms/)
- Ecology and Evolutionary Biology, PhD (https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/ecology-evolutionary-biology-phd/)

Courses

Ecology and Evolutionary Biology (EBIO)

EBIO 1010 Diversity of Life (3)
An introduction to key concepts in ecology and evolutionary biology emphasizing the diversity among individuals, population, species, communities, and ecosystems.

Corequisite(s): EBIO 1015.

EBIO 1015 Diversity of Life Lab (1)
Laboratory and field exercises designed to augment the lecture material in EBIO 1010.

Corequisite(s): EBIO 1010.

EBIO 1020 Mechanisms of Life (3)
This course will introduce students to fundamental knowledge and principles relating to cell biology including biomolecules, cellular architecture, and cellular metabolism. Special attention will be given to the molecular nature of DNA and proteins and the molecular processes of replication, transcription, and translation. The course will wrap up with overviews about various mechanisms that regulate the above processes in prokaryotic and eukaryotic cells.

EBIO 1040 Humans & Environmental Change (3)
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. EBIO 1040 is mutually exclusive with EBIO 1050 and EBIO 2050. Students may receive credit for only one of EBIO 1040, 1050, or 2050 in the undergraduate degree.

EBIO 1050 Intro to Conservation Genetics (3)
This course is designed to introduce students to the general principals behind the field of conservation genetics. We will explore evolutionary genetics, the importance of genetics in conservation, and conservation management practices. The class will cover these topics in lecture, hands-on lab activities, and field trips. Course is for high school students only. EBIO 1050 is mutually exclusive with EBIO 1040 and EBIO 2050. Students may receive credit for only one of EBIO 1040, 1050, or 2050 in the undergraduate degree.

EBIO 1070 Climate Change in Coastal Ecos (3)
How do coastal plants, animals, and microbes respond to climate change? Are coastal ecosystems resilient to climate change? This course will introduce students to the complex ways that climate change affects ecological systems in coastal areas. We will explore topics through lectures, readings, debates, field trips, and group research projects.We will learn about restoration and mitigation techniques and discuss ways students can act on behalf of threatened ecosystems

EBIO 1080 Intro to Plant & Human Affairs (3)
This course is designed to introduce you to plants and how different plants and plant products have shaped human existence. We will explore plant history, plant domestication, and plant products through lectures, readings, discussion, and field trips. (High School Students Only)

EBIO 1230 Diversity of Animal Behavior (3)
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.

EBIO 1231 Exploring Animal Behavior (3)
The goal of this course is to provide an introduction to animal behavior. The course will begin with an introduction to the application of the scientific method to the study of behavior. Topics that will follow include the ontogeny(development) of behavior, neuronal and hormonal control of behavior, migration, communication, reproductive behavior, mating systems, parental care, and the evolution of social behavior. It will involve both a lecture component as well as a hands-on laboratory component in which students will engage in activities to observe the concepts in action. This class is only open to high school students who are participating in the Tulane Science Scholars Program (TSSP). For students who pass this course with a B or higher and choose to enroll at Tulane University, this course can be applied towards three hours of general elective credit. These credits will not count towards any of the Ecology and Evolutionary Biology Department majors.

EBIO 1240 Reptile & Amphibian Diversity (3)
The goal of this course is to provide an introduction to the field of herpetology. Students will 1) become familiar with the diversity of form and function exhibited by living reptiles and amphibians, 2) gain an introductory understanding of the evolutionary histories and relationships of reptiles and amphibians to each other and to other tetrapods, 3) follow the steps of the scientific method to design and carry out experiments to test hypotheses they devise, and 4) gain experience with field and laboratory methods used to study amphibians and reptiles. The class will involve a lecture component and a hands-on laboratory component. This class is only open to high school students participating in the Tulane Science Scholars Program (TSSP). For students who pass this course with a B or higher and choose to enroll at Tulane University, this course can be applied toward three hours of general elective credit. These credits will not count toward any of the Ecology and Evolutionary Biology Department majors.

EBIO 1890 Service Learning (0-1)
Students complete a service activity in the community in conjunction with the content of a three-credit co-requisite course. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 1940 Transfer Coursework (0-20)
Transfer Coursework at the 1000 level. Departmental approval may be required.

Maximum Hours: 99

EBIO 1945 Transfer Coursework (0-20)
Transfer Coursework at the 1000 level. Department approval may be required.

Maximum Hours: 99

EBIO 2010 Evolution of Human Health & Disease (3)
An introduction to the study of infectious and non-infectious human diseases from an evolutionary perspective.

EBIO 2020 Theory and Methods in Ecology and Evolutionary Biology (3)
EBIO 2020 is an introduction to the fundamental theories and methods in ecology and evolutionary biology for EEBI and ENVB majors. Students will acquire the knowledge and skills needed to succeed in their major through direct, active experiences evaluating and communicating scientific evidence. The course topics are designed to reflect current research interests in the department, such as tropical ecology and behavioral evolution, as well as classic case studies in the discipline. Irrespective of topic, the course emphasizes a practical understanding of the scientific process and focuses on developing the skills needed for upper-level courses in EBIO. The course also provides opportunities for students to become familiar with the research interests of department faculty members, enabling them to identify future research opportunities.

Prerequisite(s): EBIO 1010 and 1015.

EBIO 2030 History of Life (3)
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.

EBIO 2040 Conservation Biology (3)
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.

Prerequisite(s): EBIO 1010 and 1015.

EBIO 2050 Global Change Biology (3)
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. EBIO 2050 is mutually exclusive with EBIO 1040 and EBIO 1050. Students may receive credit for only one of EBIO 1040, 1050, or 2050 in the undergraduate degree.

Prerequisite(s): EBIO 1010 and 1015.

EBIO 2070 Molecular and Evolutionary Genetics (4)
This course will introduce students to fundamental principles concerning the molecular nature of DNA and chromosomes; the molecular processes of replication, transcription, transition, and mutation/repair; the transmission of genetic traits (Mendelian and non-Mendelian modes); and the application of genetic analysis to population and evolutionary biology. EBIO 2070 includes a required, no credit recitation (EBIO 2071). EBIO 2070 Molecular and Evolutionary is mutually exclusive with Genetics Cell 2050 Genetics. Students may receive credit for only one of CELL 2050 or EBIO 2070 in the undergraduate degree.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 2071.

EBIO 2071 Molecular and Evolutionary Genetics Recitation (0)
This course is a required accompaniment to EBIO 2070-01 (Molecular and Evolutionary Genetics). Through readings, discussions, interactive exercises, and assignments, students will discuss the concepts and principles of genetics in an applied way, i.e. to apply genetics information to solving crosses and problems.

Corequisite(s): EBIO 2070.

EBIO 2072 Quantitative, Population & Evolutionary Genetics (1)
This course will introduce students to fundamental principles concerning the application of genetic analysis to quantitative, population and evolutionary genetics. If you have taken EBIO 2070/2071, then you do not need to take this course: it is designed only for those students who have taken CELL 2050 and wish to pursue a major within the Department of EEB. This course includes those topics missing from CELL 2050 that will help prepare all EEB majors for upper-level courses offered within the department including Processes of Evolution, Molecular Ecology and Evolution, Speciation, Systematics, Evolutionary Genomics, etc.

Prerequisite(s): EBIO 1010, 1015 and CELL 2050.

EBIO 2100 Marine Biology (3)
A systematic treatment of the organisms and habitat in the marine environment.

Prerequisite(s): EBIO 1010 and 1015.

EBIO 2110 Tropical Biology (3)
Introduction to ecological, evolutionary, and organismal studies of living organisms in the neotropics.

Prerequisite(s): EBIO 1010.

EBIO 2120 Climate, Biodiversity and Tropical Forests (3)
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 2130 Intro to Animal Behavior (3)
The goal of this course is to provide an introduction for majors and non-majors to the field of animal behavior using an evolutionary approach. The course will begin with an introduction to the application of the scientific method to the study of behavior (levels of analysis, hypothesis testing and Darwinian theory). Topics that will follow include the ontogeny (development) of behavior, neuronal and hormonal control of behavior, foraging and anti-predator behavior, habitat selection, migration, communication, reproductive behavior, mating systems, parental care, the evolution of social behavior, and the evolution of human behavior. The course emphasizes a practical understanding of animal behavior and will focus on developing the skills needed for upper-level behavior courses in EBIO.

EBIO 2210 Insects and Human Interactions (3)
This course is an introduction to the evolution, ecology and conservation of insects. The course will focus heavily on interactions between humans and insects, both historically and in modern times. A goal of the course is that you will develop the foundation and tools you need to continue learning about the importance of insects, their impacts on human society and/or other environmental issues of importance to you.

EBIO 2230 Oceanography (3)
A broad survey of chemical, physical, and geological oceanography with a brief historical overview and a consideration of current concepts.

EBIO 2240 Oceans and Human Health (3)
An overview of the relationship and interconnectivity of impacts and well-being between humans and oceans/coasts.

Prerequisite(s): (CELL 1010 or EBIO 1020) or (EBIO 1010 and 1015) or EBIO 1040 or (EENS 1300 and 1305) or SPHU 1020.

EBIO 2250 Vertebrate Biology (3)
An introduction to vertebrate natural history, including evolution, systematics, zoogeography, population dynamics, behavior, ecology, conservation, and extinction.

Prerequisite(s): EBIO 1010 and 1015.

EBIO 2360 Wetlands Ecology (3)
This course explores relationships between water, soil, plants, animals, fungi and microorganisms in various types of wetlands. Wetland types include floodplain forests, fens, bogs and marshes, with an emphasis on wetlands of the Mississippi Delta Region and the Gulf Coast. The course will further examine how climate-driven sea level rise has required coastal restoration and retreat strategies.

EBIO 2553 Special Topics (1-3)
Courses offered by visiting professors or permanent faculty primarily for undergraduates. For description, consult department. Course may be repeated unlimited times for credit.

Course Limit: 99

EBIO 2580 Urban Ecology (3)
Urban Ecology is the study of cities, including human inhabitants, as functioning ecosystems, supporting a complex web of life. In this course students will learn how basic ecological principles can be applied to the study of urban ecosystems and the effects of cities and urbanization on regional and global environments. Through a combination of lectures, readings and discussions, site visits and service learning, this course will provide an overview of interactions, at multiple scales, between the built environment and the natural environment with particular focus on New Orleans and the Gulf coast region.

EBIO 2600 Natural Resource Conservation (3)
This course examines the theory and practice of natural resource preservation in the United States, and the agencies and organizations involved in this endeavor.

Prerequisite(s): EBIO 1010 and 1015.

EBIO 2660 Special Topics (1-4)
Courses offered by visiting professors or permanent faculty primarily for undergraduates. For description, consult department. Course may be repeated unlimited times for credit.

Course Limit: 99

EBIO 2661 Special Topics (0-3)
Courses offered by visiting professors or permanent faculty primarily for undergraduates. For description, consult department. Course may be repeated unlimited times for credit.

Course Limit: 99

EBIO 2662 Special Topics (1-3)
Courses offered by visiting professors or permanent faculty primarily for undergraduates. For description, consult department. Course may be repeated unlimited times for credit.

Course Limit: 99

EBIO 2770 Nature Study in Scandinavia (3)
More than a Walk in the Park: Nature Study in Scandinavia has two components. Half of the course is a survey of the ecosystems of Scandinavia, from boreal forests to rocky intertidal zones. We will explore the diversity and ecology of regional plant and animal communities, with reference to environmental issues including non-native species, disturbance, conservation, and management. Information about the geology, history, and culture that contribute to the formation and maintenance of each ecosystem will be included. The other half of the course will involve observing, identifying, recording, and developing questions about the local diversity of the region. Be prepared to spend a considerable amount of time outside... where nature is!

EBIO 2890 Service Learning (0-1)
Students complete a service activity in the community in conjunction with the content of a three-credit co-requisite course. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 2891 Service Learning (0-1)
Students complete a service activity in the community in conjunction with the content of a three-credit co-requisite course. Course may be repeated up to unlimited credit hours.

Corequisite(s): EBIO 2210.

Maximum Hours: 99

EBIO 2910 Independent Study (1-3)
Laboratory or library research under direction of a faculty member. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 2920 Independent Study (1-3)
Laboratory or library research under direction of a faculty member. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 2940 Transfer Coursework (0-20)
Transfer Coursework at the 2000 level. Department approval may be required.

Maximum Hours: 99

EBIO 2945 Transfer Coursework (0-4)

Maximum Hours: 99

EBIO 3020 Community Engaged Conservation Research Design (3)
This 3 credit course builds student capacity to conceptualize, design and articulate community engaged research projects. Along with research design, the course trains students to think and communicate across disciplines via readings, assignments and workshops. Over the course of the semester, students will develop research questions and methodological approaches to produce an ethical, independent research proposal to investigate a problem or question related to rainforest conservation. In addition, students will learn to provide feedback and constructive criticism to the work of their peers and engage with critical perspectives on issues that arise in community engaged conservation. The expectation is that students will go on to implement the research projects that they develop in the context of this course. This course fulfills the Newcomb-Tulane College intensive writing requirement and provides an optional service-learning component.

Prerequisite(s): EBIO 3780.

EBIO 3040 General Ecology (3)
A survey of the patterns and mechanisms of interaction among all organisms and their environments, including examples of human impacts on the biosphere.

Prerequisite(s): EBIO 1010, 1015 and 2020.
Corequisite(s): EBIO 3045.

EBIO 3045 General Ecology Lab (1)
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.

Prerequisite(s): EBIO 2020.
Corequisite(s): EBIO 3040.

EBIO 3080 Processes of Evolution (3)
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.

Prerequisite(s): EBIO 2070 and 2071.

EBIO 3150 Intro to GIS (4)
This course is designed to give students a general understanding of geographic information systems (GIS) and the Environmental Systems Research Institute (ESRI) ArcGIS software. The approach taken is detailed instruction in utilizing ArcGIS to solve problems in the earth and environmental sciences. (SAME AS EBIO 6150, EENS 3150, EENS 6150,)

Corequisite(s): EBIO 3151.

EBIO 3151 Intro to GIS lab (0)
Co-requisite lab for Intro to GIS.

Corequisite(s): EBIO 3150.

EBIO 3180 Plants & Human Affairs (3)
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 3185 Plants Human Affairs Lab (1)
Laboratory course to accompany EBIO 3180. A survey of plant products and their sources, emphasizing the structure, chemistry, and diversity of economic plants.

Corequisite(s): EBIO 3180.

EBIO 3190 Darwin and Darwinism (4)
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.

Prerequisite(s): EBIO 1010 and 1015.

EBIO 3200 Natural History of Louisiana (3)
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.

Prerequisite(s): EBIO 1010 and 1015.
Corequisite(s): EBIO 3205.

EBIO 3205 Natural History of Louisiana Lab (1)
The Natural History of Louisiana Laboratory introduces students to diverse biological communities of southern and central Louisiana, from barrier islands to upland forests. Field trips focus on the ecology of regional flora and fauna and provide opportunities to observe and evaluate the impacts of invasive species, hurricane disturbance, and restoration projects. Students will practice identification skills, maintain a field journal, and participate in local research projects.

Corequisite(s): EBIO 3200.

EBIO 3290 Behavioral Ecology (3)
This course addresses the ecological and evolutionary causes and consequences of animal behavior, using both proximate and ultimate approaches. Topics include sociality, mating systems, sexual selection, animal movement, signals, behavior and conservation, and cognition.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).

EBIO 3320 Microbial Diversity & Ecology (3)
A survey of micro-organisims and their rules in and relationships within their respective ecosystems. (Same as EBIO 6320)

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020) and (EBIO 2070 or CELL 2050).
Corequisite(s): EBIO 3325.

EBIO 3325 Microbial Diversity & Ecology Lab (1)
Laboratory activities focused on observing/ascertaining microbial taxonomy (viral, bacterial, archaeal, fungal, and protistan) and methods relating to isolating/identifying microbes and measuring growth rates and metabolisms.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020) and (EBIO 2070 or CELL 2050).
Corequisite(s): EBIO 3320.

EBIO 3500 Sharks and their Relatives (3)
Biology of Sharks and their Relatives is a detailed study of the evolution, ecology, morphology, functional anatomy, physiology, and conservation of the cartilaginous fishes.

Prerequisite(s): (CELL 1010 or EBIO 1020) and EBIO 1010 and 1015.

EBIO 3550 Shark Paleobiology (3,4)
This course examines the processes and patterns of shark speciation, diversification, macroevolution, and extinction within the framework of developing a problem-based learning activity using shark teeth for a K-12 classroom. Particular emphasis is placed on the systematics and functional morphology of shark teeth.

Corequisite(s): EBIO 3890.

EBIO 3551 Shark Paleobiology Lab (0)
Lab section for EBIO 3550

EBIO 3590 Plant Biology and Adaptation (4)
An introduction to the biology of plants, with an emphasis on the aspects of physiology, anatomy, morphology, and ecology that have resulted in their successful adaptation and diversification.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 3591.

EBIO 3591 Plant Biology and Adaptation Lab (0)
Lab section for EBIO 3590.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 3590.

EBIO 3690 Experimental Animal Behavior (4)
This course provides students the opportunity to design, implement, write-up, and present an independent research project related to animal behavior .Research will be conducted on live animals at the Audubon Zoo or Audubon Park. The course will emphasize general principles of literature review and synthesis; experimental design; the collection; organization and analysis of data; and written and oral presentation of results. The course consists of 3 hours of laboratory per week (at the park or zoo) and 2 hours of seminar per week (on campus). This course fulfills the Newcomb-Tulane intensive writing requirement. This course serves as an elective for the SISE minor and fulfills the upper tier Service Learning Requirement.

Prerequisite(s): EBIO 2020.
Corequisite(s): EBIO 3691.

EBIO 3691 Experimental Animal Behavior Lab (0)
Lab section for EBIO 3690.

Corequisite(s): EBIO 3690.

EBIO 3780 Community Engaged Conservation & Field Research (3)
This study abroad course deepens student's theoretical, factual, and hands-on understanding of community engaged research and conservation in the tropics.

EBIO 3890 Service Learning (0-1)
Students complete a service activity in the community in conjunction with the content of a three-credit co-requisite course. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 3891 Service Learning (0-1)
Students complete a service activity in the community in conjunction with the content of a three-credit co-requisite course. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 3940 Transfer Coursework (0-20)
Transfer Coursework at the 3000 level. Department approval may be required.

Maximum Hours: 99

EBIO 4030 Field Botany (4)
A plant identification course focusing on terrestrial and aquatic flora of Louisiana. Lab field trips include visits to a variety of local ecosystems from coastal wetlands to upland forests. Lectures cover botany, taxonomy, and the ecological and evolutionary processes that structure plant communities, with special emphasis on how these topics apply to Louisiana ecosystems.

Prerequisite(s): EBIO 1010.
Corequisite(s): EBIO 4031.

EBIO 4031 Field Botany Lab (0)
Lab section for EBIO 4030.

Corequisite(s): EBIO 4030.

EBIO 4060 Stream Ecology (4)
Ecology of freshwater stream environments, including physical forces influencing water flow, sediment and solute geochemistry, and composition and interactions of stream biota.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 4061.

EBIO 4061 Stream Ecology Lab (0)
Lab section for EBIO 4060.

Corequisite(s): EBIO 4060.

EBIO 4080 Biostatistics and Experimental Design (3)
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.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).

EBIO 4090 Invertebrate Paleontology (4)
Principles of invertebrate paleontology; a systematic treatment of the fossil invertebrates and their living relatives. Emphasis on functional morphology, ontogeny, and paleoecology. Lectures, laboratory, field trip.

Corequisite(s): EBIO 4091.

EBIO 4091 Invertebrate Paleontology Lab (0)
Lab section for EBIO 4090.

Corequisite(s): EBIO 4090.

EBIO 4110 Tropical Ecology & Agriculture (3)
Through lectures and discussion, we develop a sound background in modern tropical ecology and agriculture, including conservation. This background will include knowledge of how scientists come to reach understanding about tropical ecosystems by using natural history/observational studies, experiments and models/theory. Finally, we will develop the analytical tools that are needed to continue learning about and acting on behalf of tropical ecosystems and/or other environmental issues of importance.

Prerequisite(s): EBIO 3040.

EBIO 4200 Ornithology (4)
An investigation into the early evolution of birds, origins and mechanics of flight, anatomy and physiology, systematics, social and breeding behavior, and the diverse life histories of birds. Tulane investigators share current research and methodologies for studying birds, and highlight the most pressing conservation issues. We spend as much time as possible in the field, visiting unique habitats across southeast Louisiana and the Gulf Coast, in search of birds to observe, describe, and identify by sight and sound.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 4201.
Course Limit: 2

EBIO 4201 Ornithology Lab (0)
Lab section for EBIO 4200.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 4200.

EBIO 4210 Vertebrate Morphology (4)
Comparative morphology, evolution, and bionomics of representative vertebrates. Lectures supplemented by weekly labs.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 4211.

EBIO 4211 Vertebrate Morphology lab (0)
Lab section for EBIO 4210.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 4210.

EBIO 4230 Molecular Evolution and Ecology (4)
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. It is strongly recommended that students also have taken CELL 2050, EBIO 3080, and EBIO 3040 or have an understanding of genetics, organismal evolution and ecological principles. This class consists of 3 lectures per week supplemented with a weekly lab.

Prerequisite(s): EBIO 2020 and 2070 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 4231.

EBIO 4231 Molecular Evolution and Ecology Lab (0)
Lab section for EBIO 4230.

Corequisite(s): EBIO 4230.

EBIO 4250 Biology of Marine Invertebrates (4)
Biology, taxonomy and distribution of the invertebrates with emphasis on the local fauna. Lectures, laboratories, and field trips. Course may be repeated 2 times for credit.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 4251.
Course Limit: 2

EBIO 4251 Biology of Marine Invertebrates Lab (0)
Co-requisite lab for EBIO 4250.

Corequisite(s): EBIO 4250.

EBIO 4270 Population Ecology (3)
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.

Prerequisite(s): EBIO 3040*.
* May be taken concurrently.

EBIO 4280 Ichthyology (4)
Biology of fish-like vertebrates, including taxonomy, evolution, anatomy, physiology, and biogeography. Course may be repeated 2 times for credit.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 4281.
Course Limit: 2

EBIO 4281 Ichthyology Lab (0)
Lab section for EBIO 4280.

Corequisite(s): EBIO 4280.

EBIO 4300 Biology of Amphibians and Reptiles (4)
This course will provide an introduction to herpetology, the study of reptiles and amphibians. Topics covered will include the evolutionary history, systematics, physiology, ecology, life history, behavior and conservation of amphibians and reptiles. The course consists of two lectures and a lab or field trip each week. Occasional weekend field trips may also be scheduled.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 4301.

EBIO 4301 Biology of Amphibians and Reptiles Lab (0)
Co-requisite lab for EBIO 4300.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).
Corequisite(s): EBIO 4300.

EBIO 4310 Plant Systematics (4)
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. Course may be repeated 2 times for credit.

Corequisite(s): EBIO 4311.
Course Limit: 2

EBIO 4311 Plant Systematics Lab (0)
Lab section for EBIO 4310.

Corequisite(s): EBIO 4310.

EBIO 4370 Aquatic Autotrophs (3)
This course will survey and provide a systematic treatment of the most common autotrophic organisms found in oceanic, coastal, estuarine, and freshwater habitats with particular emphasis on those organisms along the northern Gulf of Mexico.

Prerequisite(s): EBIO 1010 and 1015.

EBIO 4430 Entomology (4)
In this course we will study the organismal, ecological, and evolutionary biology of insects, while surveying recent literature. In addition to learning about insects as organisms and as integral parts of our ecosystem, we will study the scientific process. This course will discuss how scientists come to reach understanding about nature in general, using insects as our model. Insect collection required.

Prerequisite(s): EBIO 1010 and 1015 and (CELL 1010 or EBIO 1020).

EBIO 4431 Entomology Lab (0)
Lab section for EBIO 4430

EBIO 4440 Urban Agroecology and Sustainability in New Orleans (3)
Urban Agroecology and Sustainability in New Orleans is a project centered, 3-credit undergraduate course with mandatory tier 2 service learning. This is a course designed for students from all disciplines with a general interest in urban agriculture, ecology and sustainable food production systems. This course will provide a socio-ecological approach to the study of urban food production, by evaluating the pressures driving biodiversity, energy cycling conservation, job creation, human health and well-being. The core of this course is to successfully grow culturally appropriate produce in an urban landscape following the four principles of agroecology: environmental/ecosystem principle(table 7), social and cultural principle(table 8), economic principle(table 9) and political principle(table 10).This course will be very collaborative and hands-on where students will put theory into practice and service to the community.

Prerequisite(s): EBIO 1010.

EBIO 4460 Biodiversity and Environmental Informatics (3)
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.

Prerequisite(s): EBIO 3080 and (CELL 2050 or EBIO 2070).

EBIO 4480 Community Ecology (3)
Communities consist of resident populations of all species (e.g., animals, plants, microbes) that coexist in the same place at the same time. The field of community ecology seeks to understand the distribution and abundance of species. Elucidating the processes that give rise to these patterns requires an understanding of how populations of different species interact within communities, and with their abiotic environment. The objectives of this course are to become familiar with the main concepts and theories of community ecology and its applications to pragmatic societal issues.

Prerequisite(s): EBIO 1010 and 2020.

EBIO 4560 Internship (1-3)
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 BANNER. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 4660 Special Topics (1-4)
Courses offered for undergraduate students by visiting professors and permanent faculty. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 4661 Special Topics (1-4)
Courses offered for undergraduate students by visiting professors and permanent faculty. Course may be repeated unlimited times for credit.

Course Limit: 99

EBIO 4662 Special Topics (1-4)
Courses offered for undergraduate students by visiting professors and permanent faculty. Course may be repeated unlimited times for credit.

Course Limit: 99

EBIO 4663 Special Topics (1-3)
Courses offered for undergraduate students by visiting professors and permanent faculty. Course may be repeated unlimited times for credit.

Course Limit: 99

EBIO 4665 Special Topics Lab (1-3)
Special Topics Lab. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 4670 Topics In Marine Science (1-4)
Reserved for courses offered by LUMCON on a temporary basis or for courses taken at other marine field stations. EBIO 4680/6680 - Topics in Field Biology would be reserved for summer field courses taken at non-marine biological field stations.

EBIO 4672 Marine Field Ecology (4)
Relationships of marine and estuarine organisms to environmental factors; interactions among organisms; ecological processes of energy and materials flow; field studies of communities and ecosystems of the Louisiana coastal zone.

EBIO 4673 Marine Fish Ecology (3)
This course will explore the ecology of coastal marine fishes emphasizing aspects of how fish utilize coastal habitats and how environmental factors influence that distribution, movement, growth, reproduction, abundance and interspecific interactions of fishes, especially in early life history stages.

EBIO 4674 Marine Invertebrate Ecology (3)
In-depth study of the interaction of marine and estuarine invertebrates with their environment. Emphasis will be placed on understanding the functional role of invertebrates and how the environment shapes morphology, physiology and behavior.

EBIO 4682 Speciation (3)
How do new species evolve? This question was at the heart of Charles Darwin's On the Origin of Species, but was not directly addressed in this classic work. In this course students will explore the many scientific advances that have taken place since Darwin's time in the field of Speciation. This course will cover phenotypic and genetic mechanisms of reproductive isolation, incipient speciation, and the age -old question of What is a species? Using a combination of Coyne & Orr's classic Speciation textbook and recent primary literature students will learn how natural and sexual selection, neutral evolutionary processes, and gene flow interact to generate the astounding biodiversity that surrounds us today.

Prerequisite(s): EBIO 1010 and 2020.

EBIO 4890 Service Learning (0-1)
Students complete a service activity in the community in conjunction with the content of a three-credit corequisite course. Course may be repeated up to unlimited credit hours.

Corequisite(s): EBIO 4440.

Maximum Hours: 99

EBIO 4910 Independent Study (1-3)
Laboratory or library research under direction of a faculty member. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 4920 Independent Study (1-4)
Laboratory or library research under direction of a faculty member. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 4930 Capstone Indep Study (3-4)
A senior capstone experience for students majoring in Environmental Science-Ecology and Evolutionary Biology Track and for departmental majors unable to complete EBIO 4970/4980 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 4940 Transfer Coursework (0-20)
Transfer coursework at the 4000 level. Departmental approval required.

Maximum Hours: 99

EBIO 4960 Special Projects (1-3)
Individual studies in a selected field. Open to qualified juniors and seniors with approval of instructor and advisor. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 4990 Honors Thesis (3)
For especially qualified seniors with approval of the faculty director. Students are generally expected to have a minimum of a 3.400 overall grade-point average and a 3.500 grade-point average in the major.

Corequisite(s): EBIO 4992.

EBIO 4992 Honors Thesis Cohort (0)
The Ecology and Evolutionary Biology Honors Thesis Cohort is a weekly meeting directed by an upper-level graduate student mentor in coordination with the faculty honors thesis advisors. Students working on an independent research project will have the opportunity to discuss the scientific method, research and design, data analysis, written communication and oral presentation with their peers and mentor. The group will serve as a sounding board, a writing community and a means of meeting deadlines and achieving the expectations of the thesis. EBIO4990/5000 are co-requisites (a total of 7 credits over the course of the full academic year).

EBIO 5000 Honors Thesis (4)
For especially qualified seniors with approval of the faculty director. Students are generally expected to have a minimum of a 3.400 overall grade-point average and a 3.500 grade-point average in the major.

Prerequisite(s): EBIO 4990.
Corequisite(s): EBIO 4992.

EBIO 5380 Study Abroad (1-20)
Courses taught abroad by non-Tulane faculty. Does not count toward Tulane GPA. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 5390 Study Abroad (1-20)
Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 5970 Capstone Research Seminars (3)
EBIO5970/5971 is the capstone experience for majors in Ecology and Evolutionary Biology and Environmental Biology. A working assumption of our capstone is that you will go on to use your biological training in a professional capacity. Therefore, the course is designed to synthesize the major experience and prepare you for future career opportunities. You will engage in discussions of contemporary issues in EBIO and hone your skills in critical thinking and communication. EBIO5970 is the writing intensive version of the course. EBIO5971 students do not complete a paper. Enrollment in EBIO 5970 requires that the student is an EBIO or ENVB senior who will be graduating within the academic year.

EBIO 5971 Capstone Research Seminars (2)
EBIO5970/5971 is the capstone experience for majors in Ecology and Evolutionary Biology and Environmental Biology. A working assumption of our capstone is that you will go on to use your biological training in a professional capacity. Therefore, the course is designed to synthesize the major experience and prepare you for future career opportunities. You will engage in discussions of contemporary issues in EBIO and hone your skills in critical thinking and communication. EBIO5970 is the writing intensive version of the course. EBIO5971 students do not complete a paper. Enrollment in EBIO 5971 is restricted to seniors who are graduating within the academic year.

EBIO 6030 Field Botany (4)
A plant identification course focusing on terrestrial and aquatic flora of Louisiana. Lab field trips include visits to a variety of local ecosystems from coastal wetlands to upland forests. Lectures cover botany, taxonomy, and the ecological and evolutionary processes that structure plant communities, with special emphasis on how these topics apply to Louisiana ecosystems.

Corequisite(s): EBIO 6031.

EBIO 6031 Field Botany Lab (0)
Lab section for EBIO 6030.

Corequisite(s): EBIO 6030.

EBIO 6040 General Ecology (3-4)
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 6045 General Ecology Lab (1)

EBIO 6060 Stream Ecology (4)
Ecology of freshwater stream environments, including physical forces influencing water flow, sediment and solute geochemistry, and composition and interactions of stream biota. Class Hours: Lectures supplemented by weekly labs, some day field trips, and one weekend field trip.

Corequisite(s): EBIO 6061.

EBIO 6061 Stream Ecology lab (0)
Lab section for EBIO 6060.

Corequisite(s): EBIO 6060.

EBIO 6080 Biostatistics and Experimental Design (3)
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 6090 Invertebrate Paleontology (4)
Principles of invertebrate paleontology; a systematic treatment of the fossil invertebrates and their living relatives. Emphasis on functional morphology, ontogeny, and paleontology. Course may be repeated 2 times for credit.

Corequisite(s): EBIO 6091.
Course Limit: 2

EBIO 6091 Invertebrate Paleontology Lab (0)
Lab section for EBIO 6090.

Corequisite(s): EBIO 6090.

EBIO 6110 Tropical Ecology and Agriculture (3)
Through lectures and discussion, we develop a sound background in modern tropical ecology and agriculture, including conservation. This background will include knowledge of how scientists come to reach understanding about tropical ecosystems by using natural history/observational studies, experiments and models/theory. Finally, we will develop the analytical tools that are needed to continue learning about and acting on behalf of tropical ecosystems and/or other environmental issues of importance.

EBIO 6150 Intro to GIS (4)
This course is designed to give students a general understanding of geographic information systems (GIS) and the Environmental Systems Research Institute (ESRI) ArcGIS software. The approach taken is detailed instruction in utilizing ArcGIS to solve problems in the earth and environmental sciences. (SAME AS EBIO 3150, EENS 3150, EENS 6150,)

Corequisite(s): EBIO 6151.

EBIO 6151 Intro to GIS lab (0)
(Same as EBIO 3151, EENS 3151, EENS 6151)

Corequisite(s): EBIO 6150.

EBIO 6180 Plants & Human Affairs (3)
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 6190 Darwin and Darwinism (4)
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.

EBIO 6200 Ornithology (4)
An investigation into the early evolution of birds, origins and mechanics of flight, anatomy and physiology, systematics, social and breeding behavior, and the diverse life histories of birds. Tulane investigators share current research and methodologies for studying birds, and highlight the most pressing conservation issues. We spend as much time as possible in the field, visiting unique habitats across southeast Louisiana and the Gulf Coast, in search of birds to observe, describe, and identify by sight and sound.

Corequisite(s): EBIO 6201.

EBIO 6201 Ornithology lab (0)
Lab section for EBIO 6200

Corequisite(s): EBIO 6200.

EBIO 6210 Vertebrate Morphology (4)
Comparative morphology, evolution, and bionomics of representative vertebrates.

Corequisite(s): EBIO 6211.

EBIO 6211 Vertebrate Morphology Lab (0)
Lab section for EBIO 6210.

Corequisite(s): EBIO 6210.

EBIO 6230 Molecular Evolution and Ecology (4)
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. It is strongly recommended that students also have taken CELL 2050, EBIO 3080, and EBIO 3040 or have an understanding of genetics, organismal evolution and ecological principles. This class consists of 3 lectures per week supplemented with a weekly lab. (Same as EBIO 6230)

Corequisite(s): EBIO 6231.

EBIO 6231 Molecular Evolution and Ecology Lab (0)
Lab section for EBIO 6230.

Corequisite(s): EBIO 6230.

EBIO 6250 Biology of Marine Invertebrates (4)
Biology, taxonomy and distribution of the invertebrates with emphasis on the local fauna.

Corequisite(s): EBIO 6251.

EBIO 6251 Biology of Marine Invertebrates Lab (0)
Co-requisite lab for EBIO 6250.

Corequisite(s): EBIO 6250.

EBIO 6270 Population Ecology (3)
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 6280 Ichthyology (4)
Biology of fish-like vertebrates, including taxonomy, evolution, anatomy, physiology, and biogeography. Class Hours: Lectures supplemented by weekly labs, some day field trips, and one weekend field trip.

Corequisite(s): EBIO 6281.

EBIO 6281 Ichthyology Lab (0)
Lab section for EBIO 6280.

Corequisite(s): EBIO 6280.

EBIO 6290 Behavioral Ecology (3)
This course addresses the ecological and evolutionary causes and consequences of animal behavior, using both proximate and ultimate approaches. Topics include sociality, mating systems, sexual selection, animal movement, signals, behavior and conservation, and cognition.

EBIO 6300 Biology of Amphibians and Reptiles (4)
This course will provide an introduction to herpetology, the study of reptiles and amphibians. Topics covered will include the evolutionary history, systematics, physiology, ecology, life history, behavior and conservation of amphibians and reptiles. The course consists of two lectures and a lab or field trip each week. Occasional weekend field trips may also be scheduled.

Corequisite(s): EBIO 6301.

EBIO 6301 Biology of Amphibians and Reptiles Lab (0)
Co-requisite lab for EBIO 6300.

Corequisite(s): EBIO 6300.

EBIO 6320 Microbial Diversity & Ecology (3)
A survey of micro-organisims.and their rules in and relationships within their respective ecosystems. (Same as EBIO 3320)

Corequisite(s): EBIO 6325.

EBIO 6325 Microbial Diversity and Ecology (1)
Corequisite: EBIO 3320/6320. Laboratory activities focused on observing/ ascertaining microbial taxonomy (viral, bacterial, archaeal, fungal, and protistan) and methods relating to isolating/identifying microbes and measuring growth rates and metabolisms.

Corequisite(s): EBIO 6320.

EBIO 6340 Ecological Analysis (3)
Study of powerful methods for designing ecological studies and analyzing ecological data, assuming a knowledge of basic parametric and nonparametric statistics.

EBIO 6370 Aquatic Autotrophs (3)
This course will survey and provide a systematic treatment of the most common autotrophic organisms found in oceanic, coastal, estuarine, and freshwater habitats with particular emphasis on those organisms along the northern Gulf of Mexico.

EBIO 6380 Phylogenetics (3)
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 6430 Entomology (4)
In this course we will study the organismal, ecological, and evolutionary biology of insects, while surveying recent literature. In addition to learning about insects as organisms and as integral parts of our ecosystem, we will study the scientific process. This course will discuss how scientists come to reach understanding about nature in general, using insects as our model. Insect collection required.

EBIO 6431 Entomology Lab (0)
Lab section for EBIO 6430.

EBIO 6440 Introduction to Data Science for Ecologists (3)
This course will introduce a set of data-science and computing skills, equivalent to basic lab skills, necessary for conducting reproducible, collaborative, and efficient analyses, with an emphasis on ecological problems. The primary tools will be R and RStudio, other tools for data management and collaboration will be introduced as needed (e.g., git, GitHub, OpenRefine). Students will learn, basics of data management, manipulation, visualization, and analysis as well as the concepts of literate programming – writing code that a computer can execute and a human reader can understand – and reproducibility / repeatability in research. In this course, we will learn by doing, replicating a genuine research experience. After some training in the basics, students will be assigned published scientific articles and work in teams (that include the instructor) to repeat analyses from those articles. No previous experience in R or programming is required.

EBIO 6460 Biodiversity and Environmental Informatics (3)
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.

EBIO 6480 Community Ecology (3)
Communities consist of resident populations of all species (e.g., animals, plants, microbes) that coexist in the same place at the same time. The field of community ecology seeks to understand the distribution and abundance of species. Elucidating the processes that give rise to these patterns requires an understanding of how populations of different species interact within communities, and with their abiotic environment. The objectives of this course are to become familiar with the main concepts and theories of community ecology and its applications to pragmatic societal issues.

EBIO 6500 Sharks and Their Relatives (3)
Biology of Sharks and Their Relatives is a detailed study of the evolution, ecology, morphology, functional anatomy, physiology, and conservation of the cartilaginous fishes.

EBIO 6550 Shark Paleobiology (3,4)
This course examines the processes and patterns of shark speciation, diversification, macroevolution, and extinction within the framework of developing a problem-based learning activity using shark teeth for a K-12 classroom. Particular emphasis is placed on the systematics and functional morphology of shark teeth.

EBIO 6551 Shark Paleobiology Lab (0)
Lab section for EBIO 6550

EBIO 6580 Urban Ecology (3)
Urban Ecology is the study of cities, including human inhabitants, as functioning ecosystems, supporting a complex web of life. In this course students will learn how basic ecological principles can be applied to the study of urban ecosystems and the effects of cities and urbanization on regional and global environments. Through a combination of lectures, readings and discussions, site visits and service learning, this course will provide an overview of interactions, at multiple scales, between the build environment and the natural environment with particular focus on New Orleans and the Gulf coast region.

EBIO 6590 Plant Biology and Adaptation (4)
An introduction to the biology of plants, with an emphasis on the aspects of physiology, anatomy, morphology, and ecology that have resulted in their successful adaptation and diversification. Lectures supplemented by weekly labs and occasional field trips.

Corequisite(s): EBIO 6591.

EBIO 6591 Plant Biology & Adaptation Lab (0)
Lab section for EBIO 6590.

Corequisite(s): EBIO 6590.

EBIO 6660 Special Topics (0-4)
Courses offered by visiting professors or permanent faculty primarily for undergraduates. For description, consult department. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 6661 Special Topics (0-4)
Courses offered by visiting professors or permanent faculty primarily for graduates. For description, consult department. Course may be repeated unlimited times for credit.

Course Limit: 99

EBIO 6662 Special Topics (0-4)
Courses offered by visiting professors or permanent faculty primarily for undergraduates. For description, consult department. Course may be repeated unlimited times for credit.

Course Limit: 99

EBIO 6663 Special Topics (0-4)
Courses offered by visiting professors or permanent faculty primarily for undergraduates. For description, consult department. Course may be repeated unlimited times for credit.

Course Limit: 99

EBIO 6665 Special Topics Lab (1-3)
Special Topics Lab. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 6670 Topics in Marine Science (1-4)
Reserved for courses offered by LUMCON on a temporary basis or for courses taken at other marine field stations. EBIO 4680/6680 - Topics in Field Biology would be reserved for summer field courses taken at non-marine biological field stations.

EBIO 6672 Marine Field Ecology (4)
Relationships of marine and estuarine organisms to environmental factors; interactions among organisms; ecological processes of energy and materials flow; field studies of communities and ecosystems of the Louisiana coastal zone.

EBIO 6673 Marine Fish Ecology (3)
In-depth study of the interaction of marine and estuarine invertebrates with their environment. Emphasis will be placed on understanding the functional role of invertebrates and how the environment shapes morphology, physiology and behavior.

EBIO 6682 Speciation (3)
How do new species evolve? This question was at the heart of Charles Darwin's On the Origin of Species, but was not directly addressed in this classic work. In this course students will explore the many scientific advances that have taken place since Darwin's time in the field of Speciation. This course will cover phenotypic and genetic mechanisms of reproductive isolation, incipient speciation, and the age -old question of What is a species? Using a combination of Coyne & Orr's classic Speciation textbook and recent primary literature students will learn how natural and sexual selection, neutral evolutionary processes, and gene flow interact to generate the astounding biodiversity that surrounds us today.

EBIO 6690 Experimental Animal Behavior (4)
This course provides students the opportunity to design, implement, write-up, and present an independent research project related to animal behavior .Research will be conducted on live animals at the Audubon Zoo or Audubon Park. The course will emphasize general principles of literature review and synthesis; experimental design; the collection; organization and analysis of data; and written and oral presentation of results. The course consists of 3 hours of laboratory per week (at the park or zoo) and 2 hours of seminar per week (on campus). This course fulfills the Newcomb-Tulane intensive writing requirement.

Corequisite(s): EBIO 6691.

EBIO 6691 Experimental Animal Behavior Lab (0)
Lab section for EBIO 6690.

Corequisite(s): EBIO 6690.

EBIO 6700 Math Models in Ecology and Evolution (3)
An introductory course in mathematical modeling in biology with emphasis on construction and interpretation of models in ecology. The goals of the course are to provide training in a wide variety of mathematical and computational techniques that are used to describe ecological systems, to learn to construct ecological models and provide instruction in the biological interpretation of mathematical results.

EBIO 6777 Foundations in Ecology and Evolutionary Biology (3)
This course is intended to provide graduate students with a conceptually-oriented foundation in ecology and evolutionary biology. Students use primary sources to study classic literature (e.g., Darwin's "On the Origin of Species") and discuss it with respect to contemporary and pressing issues in ecology and evolutionary biology.

EBIO 6810 EEB Journal Review (1)
Discussion of significant new publications in ecology, evolutionary biology, and related fields. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 6850 Current Topics in Ecology and Evolutionary Biology (3)
In-depth examination of a selected topic in ecology and evolutionary biology. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 6910 Independent Study (1-4)
Advanced independent studies in a selected field of biology. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 6911 Independent Study (1-4)
This is a directed study course that allows a graduate student to pursue a topic of particular interest under the direction of a faculty member.

Maximum Hours: 99

EBIO 6920 Independent Study (1-4)
Advanced independent studies in a selected field of biology. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 6940 Transfer Coursework (0-20)
Transfer coursework at the 6000 level. Departmental approval required.

Maximum Hours: 99

EBIO 7010 Process of Science in Ecology and Evolutionary Biology (3)
The class presents a thorough review and experimental exposure to the process of funding and disseminating results of scientific research. Students will write and submit fundable grant proposals, give research seminars, participate in the peer review process, and examine job opportunities within and outside academia.

EBIO 7150 Problems in Environmental Biology (3)
Restricted to 5 graduate year students; Directed independent study applying field and laboratory methods to environmental problems.

Maximum Hours: 99

EBIO 7160 Problems in Environmental Biology (3)
Restricted to 5 graduate year students; Directed independent study applying field and laboratory methods to environmental problems.

EBIO 7660 Internship in Environmental Biology (3)
Restricted to 5 graduate year students: Experimental learning in cooperation with federal, state, municipal or private agencies and industry.

EBIO 7670 Internship in Environmental Biology (3)
Restricted to 5 graduate year students: Experimental learning in cooperation with federal, state, municipal or private agencies and industry.

EBIO 7940 Transfer Credit-Grad (1-12)
Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 7990 Doctoral Pre-Candidacy RSH (1-9)
Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 8030 Advanced Standing (4)
Advanced Standing course: EBIO 6030

EBIO 8580 Advanced Standing (3)
Advanced Standing course: EBIO 6580

EBIO 8590 Advanced Standing (4)
Advanced Standing course: EBIO 6590

EBIO 9980 Masters Research (3)
Research toward completion of a masters degree. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99

EBIO 9990 Dissertation Research (3)
Research toward completion of a doctoral degree. Course may be repeated up to unlimited credit hours.

Maximum Hours: 99