

EVOLUTION & ECOLOGY

College of Biological Sciences

John Stachowicz, Ph.D., Chairperson of the Department; term ends June 30, 2022.

Peter Wainwright, Ph.D., Chairperson of the Department; July 1, 2022-June 30, 2025.

Department Office

2320 Storer Hall; 530-752-1272; Evolution & Ecology (<https://eve.ucdavis.edu/>); Faculty (<https://eve.ucdavis.edu/people/>)

The department of Evolution & Ecology offers the majors and minor in Evolution, Ecology & Biodiversity.

- Evolution, Ecology & Biodiversity, Bachelor of Arts (<https://catalog.ucdavis.edu/departments-programs-degrees/evolution-ecology/evolution-ecology-biodiversity-ab/>)
- Evolution, Ecology & Biodiversity, Bachelor of Science (<https://catalog.ucdavis.edu/departments-programs-degrees/evolution-ecology/evolution-ecology-biodiversity-bs/>)
- Evolution, Ecology & Biodiversity, Minor (<https://catalog.ucdavis.edu/departments-programs-degrees/evolution-ecology/evolution-ecology-biodiversity-minor/>)

Evolution and Ecology (EVE)

EVE 002 – Biodiversity (3 units)

Course Description: Introduction to nature, scope and geographical distribution of biodiversity (the diversity of life, with emphasis on plants and animals, especially insects). Humans and biodiversity; domestication, aesthetics, ethics and valuation. Species richness and "success." Biodiversity through time; monitoring, evaluation and conservation. Biomes - global, continental and Californian.

Learning Activities: Lecture 2 hour(s), Lecture/Discussion 1 hour(s).

Cross Listing: ENT 002.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Scientific Literacy (SL); Writing Experience (WE).

EVE 010 – Evolution for Non-Biologists (3 units)

Course Description: Introduction to evolutionary biology for the general population.

Learning Activities: Lecture 3 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Scientific Literacy (SL).

EVE 011 – Principles of Ecology (4 units)

Course Description: Ecological principles with emphasis on humans and their interactions with the environment; how humans affect and depend on natural ecosystems; the future of the Earth's biosphere.

Prerequisite(s): Elementary biology recommended.

Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Oral Skills (OL); Scientific Literacy (SL); Writing Experience (WE).

EVE 012 – Life in the Sea (3 units)

Course Description: Diversity of life in the sea; adaptations to physical/chemical ocean environment; marine science research methods; utilization of living marine resources by humans; factors and processes that influence diversity of sea life, including humans.

Learning Activities: Lecture 3 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Scientific Literacy (SL).

EVE 013 – Sex in the Natural World (3 units)

Course Description: Explores the diversity, mechanisms and evolution of sexual behaviors across the kingdoms of life.

Learning Activities: Lecture/Discussion 3 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Scientific Literacy (SL); Visual Literacy (VL).

EVE 016 – Wild Davis: A California Naturalist Certification Course (4 units)

Course Description: Natural history and urban ecology of Davis. Basics of ecological observation, community science and service, and California's unique natural communities. If fee is paid, completion of the course provides certification in the UC California Naturalist Program.

Learning Activities: Lecture 3 hour(s), Fieldwork.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Scientific Literacy (SL); Writing Experience (WE).

EVE 017 – Dining with Darwin: Evolutionary Insights Into Your Diet (3 units)

Course Description: Crave salty, fatty, sugary foods? Want to know why? Evolution of cravings, metabolism and dentition, and of cooking our food. Relate Paleo, South Beach, and vegan diets to ancestral and global diets and current metabolism. For majors and nonmajors.

Learning Activities: Lecture 3 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE) or Social Sciences (SS); World Cultures (WC).

EVE 020 – Darwinian Medicine (3 units)

Course Description: Introduction for non-biologists to the evolved traits of humans and pathogens that influence human biological variation, health, and disease.

Learning Activities: Lecture 3 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Scientific Literacy (SL).

EVE 092 – Internship (1-12 units)

Course Description: Work experience off and on campus in all subject areas offered in the Department of Evolution & Ecology. Internships supervised by a member of the faculty.

Prerequisite(s): Consent of instructor; lower division standing.

Learning Activities: Internship 3-36 hour(s).

Repeat Credit: May be repeated.

Grade Mode: Pass/No Pass only.

EVE 098 – Directed Group Study (1-5 units)

Course Description: Directed group study.

Prerequisite(s): Consent of instructor.

Learning Activities: Variable.

Repeat Credit: May be repeated.

Grade Mode: Pass/No Pass only.

General Education: Science & Engineering (SE).

EVE 099 – Special Study for Lower Division Students (1-5 units)

Course Description: Special study for lower division students.

Learning Activities: Variable.

Grade Mode: Pass/No Pass only.

General Education: Science & Engineering (SE).

EVE 100 – Introduction to Evolution (4 units)

This version has ended; see updated course, below.

Course Description: General survey of the origins of biological diversity and evolutionary mechanisms.

Prerequisite(s): (BIS 002A, BIS 002B, BIS 002C); (MAT 016A or MAT 017A or MAT 021A); (MAT 016B or MAT 017B or MAT 021B); STA 100 recommended.

Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Scientific Literacy (SL).

EVE 100 – Introduction to Evolution (4 units)

Course Description: General survey of the origins of biological diversity and evolutionary mechanisms.

Prerequisite(s): (BIS 002A, BIS 002B, BIS 002C); (MAT 016A or MAT 017A or MAT 019A or MAT 021A); (MAT 016B or MAT 017B or MAT 019B or MAT 021B); STA 100 recommended.

Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Scientific Literacy (SL).

This course version is effective from, and including: Summer Session 1 2024.

EVE 101 – Introduction to Ecology (4 units)

This version has ended; see updated course, below.

Course Description: General survey of the principles of ecology.

Prerequisite(s): (BIS 002A, BIS 002B, BIS 002C); (MAT 016A or MAT 017A or MAT 021A); (MAT 016B or MAT 017B or MAT 021B); or the equivalent.

Learning Activities: Lecture 3 hour(s), Lecture/Discussion 1 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Scientific Literacy (SL); Visual Literacy (VL).

EVE 101 – Introduction to Ecology (4 units)

Course Description: General survey of the principles of ecology.

Prerequisite(s): (BIS 002A, BIS 002B, BIS 002C); (MAT 016A or MAT 017A or MAT 019A or MAT 021A); (MAT 016B or MAT 017B or MAT 019B or MAT 021B); or the equivalent.

Learning Activities: Lecture 3 hour(s), Lecture/Discussion 1 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Scientific Literacy (SL); Visual Literacy (VL).

This course version is effective from, and including: Summer Session 1 2024.

EVE 101Q – Introduction to Computer Models in Ecology (1 unit)

Course Description: Computational methods and mathematical models used to study ecological phenomena.

Prerequisite(s): EVE 101 (can be concurrent); EVE 101 required concurrently.

Learning Activities: Auto Tutorial 1.50 hour(s), Extensive Problem Solving 1.50 hour(s).

Grade Mode: Letter.

EVE 102 – Population & Quantitative Genetics (4 units)

Course Description: Evolution as caused by random mating, genetic drift, natural selection, inbreeding, migration, and mutation in theory and actuality. The resemblance between relatives and consequences of selection for quantitative traits. Application of these ideas to topics such as the evolution of sex.

Prerequisite(s): BIS 101; (STA 100 or STA 102); EVE 100.

Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE).

EVE 103 – Phylogeny, Speciation & Macroevolution (4 units)

Course Description: Statistical inference of evolutionary patterns and processes above the species level. Topics include estimation of phylogenies and divergence times, character evolution, biogeographic history, and rates and patterns of lineage diversification, with an emphasis on the origin of species.

Prerequisite(s): EVE 100.

Learning Activities: Lecture 3 hour(s), Discussion/Laboratory 3 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Scientific Literacy (SL).

EVE 104 – Community Ecology (4 units)

Course Description: Population growth and density dependence; predation; exploitative, interference and apparent competition; mutualism and facilitation; coexistence mechanisms; niches, spatial and temporal variation etc. Emphasis on quantitative understanding through models, concepts, and empirical evidence.

Prerequisite(s): EVE 101 or ESP 100.

Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).

Cross Listing: ESP 104.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Writing Experience (WE).

EVE 105 – Phylogenetic Analysis of Vertebrate Structure (4 units)

Course Description: The structure of the classes and subclasses of vertebrates is described and interpreted in terms of phylogeny.

Prerequisite(s): (BIS 001A, BIS 001B) or (BIS 002B, BIS 002C).

Learning Activities: Lecture 2 hour(s), Laboratory 6 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE).

EVE 106 – Mechanical Design in Organisms (3 units)

Course Description: Explores fundamental principles in the form and function of organisms, examining how basic properties of size, shape, structure, and habitat constrain ways in which plants and animals interact and cope with their physical surroundings.

Prerequisite(s): Upper division standing or consent of instructor; introductory animal biology (BIS 001B or BIS 002B), invertebrate zoology (EVE 112), and/or ecology (EVE 101) are recommended; residence at or near Bodega Marine Lab required.

Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s), Laboratory 3 hour(s), Fieldwork 3 hour(s).

Enrollment Restriction(s): Enrollment restricted to application at <http://www.bml.ucdavis.edu>.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Visual Literacy (VL); Writing Experience (WE).

EVE 107 – Animal Communication (4 units)

Course Description: How animals use songs, dances, colors, chemicals, electricity and vibrations to communicate. Mechanisms of signal production and detection (sensory systems), theory of information transfer and signal design, and the role of natural selection in shaping communication.

Prerequisite(s): BIS 002B.

Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Visual Literacy (VL).

EVE 108 – Systematics & Evolution of Angiosperms (5 units)

Starting Winter Quarter 2024, this course is no longer offered.

Course Description: Diversity and classification of angiosperms (flowering plants) on a world scale, and current understanding of the origin of angiosperms and evolutionary relationships and trends within them based on morphological and molecular evidence.

Prerequisite(s): (BIS 001A, BIS 001B, BIS 001C) or (BIS 002A, BIS 002B, BIS 002C).

Learning Activities: Lecture 3 hour(s), Laboratory 6 hour(s).

Cross Listing: PLB 108.

Grade Mode: Letter.

EVE 109 – Molecular Ecology (4 units)

Course Description: Use of molecular tools to answer fundamental questions in ecology and evolution of natural populations. Use of DNA and protein sequences to measure diversity and natural selection within and between populations and species and application to the fields of ecology and conservation. Hands-on manipulation and analysis of data in R.

Prerequisite(s): BIS 002B.

Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).

Grade Mode: Letter.

EVE 110 – Running, Swimming & Flying (3 units)

Course Description: Examines the bases of organism movement in terrestrial, aquatic, and aerial environments, emphasizing both the unifying principles underlying locomotion, as well as a range of strategies employed across diverse groups of organisms.

Prerequisite(s): Upper division standing or consent of instructor; introductory animal biology (BIS 001B or BIS 002B), invertebrate zoology (EVE 112), and/or ecology (EVE 101) are recommended; residence at or near Bodega Marine Lab required.

Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s), Laboratory 3 hour(s), Fieldwork 3 hour(s).

Enrollment Restriction(s): Enrollment restricted to application at <http://www.bml.ucdavis.edu>.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Visual Literacy (VL); Writing Experience (WE).

EVE 111 – Marine Environmental Issues (1 unit)

Course Description: Examination of critical environmental issues occurring in coastal waters including the effects of climate change, overfishing, and other human impacts. Through readings and group discussions, students will develop an integrative understanding of the oceanographic and ecological processes.

Prerequisite(s): Consent of instructor.

Learning Activities: Discussion 1 hour(s).

Repeat Credit: May be repeated 2 time(s) when topic differs.

Cross Listing: ESP 111.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Scientific Literacy (SL).

EVE 112 – Biology of Invertebrates (3 units)

Course Description: Survey of the invertebrate phyla, emphasizing aquatic forms, and focusing on morphology, development, natural history, ecology, and phylogenetic relationships.

Prerequisite(s): BIS 001B or (BIS 002B, BIS 002C); courses in systematics, ecology, and evolution recommended.

Learning Activities: Lecture 3 hour(s).

Enrollment Restriction(s): Limited enrollment.

Grade Mode: Letter.

EVE 112L – Biology of Invertebrates Laboratory (2 units)

Course Description: Field and laboratory experience with representative members of the major invertebrate phyla discussed in EVE 112.

Emphasis on comparative morphology, natural history, ecology, and behavior of living invertebrates. Two field trips required.

Prerequisite(s): (BIS 001B or (BIS 002B, BIS 002C)), EVE 112 (can be concurrent); EVE 112 required concurrently.

Learning Activities: Laboratory 6 hour(s).

Enrollment Restriction(s): Enrollment limited to 50 students.

Grade Mode: Letter.

EVE 114 – Experimental Invertebrate Biology (3 units)

Course Description: Biology, ecology, and evolution of local marine invertebrates with a focus on adaptations to environmental and biological factors encountered on the California coast. Hands-on field and laboratory learning with an emphasis on generating and testing hypotheses.

Prerequisite(s): Upper division standing or consent of instructor; introductory cell, animal and plant biology (BIS 001A and BIS 001B and BIS 001C, or BIS 002B), invertebrate zoology (EVE 112), ecology (EVE 101), and/or evolution (EVE 100) are recommended; residence at or near Bodega Marine Lab required.

Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s), Laboratory 3 hour(s), Fieldwork 3 hour(s).

Enrollment Restriction(s): Enrollment restricted to application at <http://www.bml.ucdavis.edu>.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Visual Literacy (VL); Writing Experience (WE).

EVE 115 – Marine Ecology (4 units)

Course Description: Processes affecting the distribution, abundance, and diversity of plant and animal life in the sea. Introduction to marine habitat diversity and human impacts on marine ecosystems.

Prerequisite(s): EVE 101 or ESP 100 or BIS 002B; or consent of instructor.

Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Scientific Literacy (SL); Visual Literacy (VL); Writing Experience (WE).

EVE 117 – Plant Ecology (4 units)

Course Description: The study of the interactions between plants, plant populations or vegetation types and their physical and biological environment. Special emphasis on California. Four full-day field trips and brief write-up of class project required.

Prerequisite(s): (BIS 001A, BIS 001B, BIS 001C) or (BIS 002A, BIS 002B, BIS 002C); PLB 111 recommended.

Learning Activities: Lecture 3 hour(s), Fieldwork 3 hour(s).

Cross Listing: PLB 117.

Grade Mode: Letter.

EVE 119 – Population Biology of Invasive Plants & Weeds (3 units)

Course Description: Origin and evolution of invasive plant species and weeds, reproduction and dispersal, seed ecology, modeling of population dynamics, interactions between invasive species, native species, and crops, biological control. Laboratories emphasize design of competition experiments and identification of weedy species.

Prerequisite(s): (BIS 001A, BIS 001B, BIS 001C) or (BIS 002A, BIS 002B, BIS 002C); introductory statistics recommended.

Learning Activities: Lecture 2 hour(s), Laboratory 3 hour(s).

Cross Listing: PLB 119.

Grade Mode: Letter.

General Education: Science & Engineering (SE).

EVE 120 – Global Change Ecology (3 units)

Course Description: Treatment of historical evolution of the biosphere resulting from physical, chemical, and biological influences. Special focus upon changes caused by humans. Topics pertain to biodiversity, resources, conservation, and ecosystem services.

Prerequisite(s): EVE 100; EVE 101; or equivalents.

Learning Activities: Lecture/Discussion 3 hour(s).

Grade Mode: Letter.

EVE 127 – Systematics of Vascular Plants (5 units)

Course Description: Diversity, phylogeny, and taxonomy of lycophytes, ferns, and seed plants (gymnosperms and angiosperms), emphasizing relationships and distinguishing characteristics of families and genera represented in the California flora. Principles and methods of phylogeny reconstruction, classification, and plant nomenclature. Practice identifying plants to species using taxonomic keys.

Prerequisite(s): BIS 002C or PLS 002; or consent of instructor.

Learning Activities: Lecture 3 hour(s), Laboratory 6 hour(s).

Credit Limitation(s): No credit if student has taken PLB/PLS 102 or EVE/PLB 108.

Cross Listing: PLB 127, PLS 127.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Visual Literacy (VL).

EVE 131 – Human Genetic Variation & Evolution (3 units)

Course Description: Introduction to genome-wide nucleotide sequence variation in human populations and computational methods for its analysis. Topics to include forensics, disease gene mapping, and studies of human evolutionary history. Misuses, such as eugenics, and ethical/legal issues will be discussed.

Prerequisite(s): BIS 001B or BIS 002B.

Learning Activities: Lecture 3 hour(s).

Grade Mode: Letter.

EVE 138 – Ecology of Tropical Latitudes (5 units)

Course Description: Biological, physical, and human-related aspects of the ecology of low latitudes. Distribution, numbers, and relationships of tropical organisms. Problems of development and conservation in the context of ecological and evolutionary theory.

Prerequisite(s): Consent of instructor. One course in Biological Sciences (BIS), Entomology (ENT), Wildlife, Fish, Conservation Biology (WFC), Geography (GEO), or tropical experience.

Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s), Extensive Writing.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Scientific Literacy (SL); Writing Experience (WE).

EVE 140 – Paleobotany (4 units)

Course Description: Introduction to plant fossil record, beginning with invasion of land in the Silurian, emphasizing origin and evolution of major groups and adaptations and changing composition and distribution of floras in relation to plate tectonics and climatic change.

Prerequisite(s): (BIS 001A, BIS 001B, BIS 001C) or (BIS 002A, BIS 002B, BIS 002C).

Learning Activities: Lecture 3 hour(s), Laboratory 3 hour(s).

Grade Mode: Letter.

EVE 141 – Principles of Systematics (3 units)

Course Description: Historical background, philosophical rationale, contemporary approaches, and working rules of biosystematics, including International Code of Zoological Nomenclature.

Prerequisite(s): BIS 001B or BIS 001C or BIS 002B; EVE 100 recommended.

Learning Activities: Lecture 2 hour(s), Independent Study.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Oral Skills (OL); Quantitative Literacy (QL); Scientific Literacy (SL); Visual Literacy (VL); Writing Experience (WE).

EVE 147 – Biogeography (4 units)

Course Description: Movements of terrestrial organisms. The role of geologic, climatic, and biologic changes in the geographic distribution of organisms.

Prerequisite(s): BIS 002B or (BIS 001A, BIS 001B).

Learning Activities: Lecture 3 hour(s), Term Paper.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Scientific Literacy (SL); Visual Literacy (VL); Writing Experience (WE).

EVE 149 – Evolution of Ecological Systems (4 units)

Course Description: Evolution as an organizing force in natural communities. Coadaptation in trophic and competitive relationships. Ecology of polymorphisms, clines, and speciation.

Prerequisite(s): (EVE 101 or ESP 100); EVE 100; or equivalent courses.

Learning Activities: Lecture 3 hour(s), Term Paper.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Scientific Literacy (SL); Writing Experience (WE).

EVE 150 – Evolution of Animal Development (3 units)

Course Description: Comparative analysis of animal development and the genetic basis of morphological diversification.

Prerequisite(s): BIS 101; EVE 100; EVE 100 (may be waived for graduate students with consent of instructor).

Learning Activities: Lecture 3 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Writing Experience (WE).

EVE 161 – Microbial Phylogenomics; Genomic Perspectives on the Diversity & Diversification of Microbes (3 units)

Course Description: Use of DNA and genomic sequencing in studies of the diversity of microorganisms. Diversity of microbes, phylogenetics, genome sequencing, comparative genomics, phylogenomics, lateral gene transfer, molecular ecology, metagenomics, and studies of the human microbiome.

Prerequisite(s): BIS 002A; BIS 002B; BIS 002C; or equivalent.

Learning Activities: Lecture 3 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE).

EVE 175 – Computational Genetics (3 units)

Course Description: The use of computers to solve problems in genetics and evolution. Introduction to a general purpose computer language (Python), computational statistical methods, and applications such as QTL mapping, linkage detection, estimation of rates of evolution, and gene finding.

Prerequisite(s): BIS 101; (STA 100 or STA 102).

Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s).

Grade Mode: Letter.

EVE 180A – Experimental Ecology & Evolution in the Field (4 units)

Course Description: Experimental design in field ecology. Examination of primary literature, experimental design, independent and collaborative research, analysis of data, development of original research paper based on field experiments.

Prerequisite(s): EVE 100 (can be concurrent); (EVE 101 (can be concurrent) or ESP 100 (can be concurrent) or ENT 105 (can be concurrent)); consent of instructor.

Learning Activities: Lecture/Lab 3 hour(s), Project 3 hour(s); Fieldwork.

Cross Listing: ENT 180A.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL).

EVE 180B – Experimental Ecology & Evolution in the Field (4 units)

Course Description: Experimental design in field ecology. Examination of primary literature, experimental design, independent and collaborative research, analysis of data, development of original research paper based on field experiments.

Prerequisite(s): EVE 180A or ENT 180A.

Learning Activities: Lecture/Lab 3 hour(s), Project 3 hour(s); Fieldwork.

Cross Listing: ENT 180B.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Quantitative Literacy (QL); Writing Experience (WE).

EVE 181 – Ecology & Evolution of Animal-Plant Interactions (4 units)

Course Description: Animal adaptations for eating plants, pollinating flowers, dispersing seeds. Plant adaptations to herbivore defense, attraction of mutualists; role of coevolutionary arms race, mutualists and cheaters in plant/animal speciation. Exploration through lectures, original scientific literature, discussions and term paper.

Prerequisite(s): BIS 002B; BIS 002C (can be concurrent).

Learning Activities: Lecture 1.50 hour(s), Lecture/Discussion 1.50 hour(s), Term Paper, Extensive Writing/Discussion.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Oral Skills (OL); Quantitative Literacy (QL); Scientific Literacy (SL); Writing Experience (WE).

EVE 189 – Introduction to Biological Research (1 unit)

Course Description: Introduction to research methods in biology.

Presentation and discussion of research by faculty, graduate, and undergraduate students.

Prerequisite(s): Consent of instructor; upper division standing in Evolution Ecology or related biological science.

Learning Activities: Discussion 1 hour(s).

Repeat Credit: May be repeated 6 unit(s).

Grade Mode: Pass/No Pass only.

General Education: Science & Engineering (SE).

EVE 190 – Undergraduate Seminar (2 units)

Course Description: Student reports on current topics with emphasis on integration of concepts, synthesis, and state-of-the-art research approaches. Reviews of literature and reports of undergraduate research may be included.

Prerequisite(s): Upper division standing in the biological sciences or a related discipline.

Learning Activities: Seminar 2 hour(s).

Repeat Credit: May be repeated.

Grade Mode: Pass/No Pass only.

General Education: Science & Engineering (SE).

EVE 192 – Internship (1-12 units)

Course Description: Work experience off and on campus in all subject areas offered in the Department of Evolution & Ecology. Internships supervised by a member of the faculty.

Prerequisite(s): Consent of instructor; completion of 84 units.

Learning Activities: Internship 3-36 hour(s).

Repeat Credit: May be repeated.

Grade Mode: Pass/No Pass only.

EVE 194HA – Research Honors (2 units)

Course Description: Students pursue intensive research under the guidance of a faculty advisor. Students are expected to complete the full three-quarter sequence culminating in the writing of an honors thesis.

Prerequisite(s): Students who have completed 135 units and qualify for the Honors Program (as defined by the current catalog).

Learning Activities: Laboratory 6 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Writing Experience (WE).

EVE 194HB – Research Honors (2 units)

Course Description: Students pursue intensive research under the guidance of a faculty advisor. Students are expected to complete the full three-quarter sequence culminating in the writing of an honors thesis.

Prerequisite(s): Students who have completed 135 units and qualify for the Honors Program (as defined by the current catalog).

Learning Activities: Laboratory 6 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Writing Experience (WE).

EVE 194HC – Research Honors (2 units)

Course Description: Students pursue intensive research under the guidance of a faculty advisor. Students are expected to complete the full three-quarter sequence culminating in the writing of an honors thesis.

Prerequisite(s): Students who have completed 135 units and qualify for the Honors Program (as defined by the current catalog).

Learning Activities: Laboratory 6 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Writing Experience (WE).

EVE 197T – Tutoring in Biological Sciences 2B (1-2 units)

Course Description: Assisting the instructor by tutoring students in a Biological Sciences 2B laboratory. Tutoring is voluntary and is supervised by a Laboratory Teaching Assistant and the Laboratory Coordinator.

Prerequisite(s): BIS 001B B or better.

Learning Activities: Tutorial 3 hour(s).

Repeat Credit: May be repeated 3 time(s).

Grade Mode: Pass/No Pass only.

General Education: Science & Engineering (SE).

EVE 198 – Directed Group Study (1-5 units)

Course Description: Directed group study. May be taught abroad.

Learning Activities: Variable.

Grade Mode: Pass/No Pass only.

EVE 199 – Special Study for Advanced Undergraduates (1-5 units)

Course Description: Special study for advanced undergraduates.

Prerequisite(s): Consent of instructor.

Learning Activities: Variable.

Grade Mode: Pass/No Pass only.

General Education: Science & Engineering (SE).

EVE 210 – Molecular Phylogenetic Analysis (3 units)

Course Description: Theory and practice of inferring phylogenetic trees using molecular sequence data. Practical techniques for obtaining sequence data, advantages and disadvantages of common approaches for inferring trees, statistical methods for comparing alternative hypotheses.

Learning Activities: Lecture 2 hour(s), Laboratory 3 hour(s).

Cross Listing: NEM 210.

Grade Mode: Letter.

EVE 211 – Applied Phylogenetics (3 units)

Course Description: Applications of phylogenetic methods to fields outside of systematics. Core lectures/labs in remedial phylogenetics, phylogeography, conservation and comparative morphology. Special topics vary yearly.

Prerequisite(s): EVE 103 or EVE 210 or PBG 200C; or equivalent, graduate standing.

Learning Activities: Lecture 2 hour(s), Laboratory 3 hour(s).

Repeat Credit: May be repeated 1 time(s).

Grade Mode: Letter.

EVE 220 – Species & Speciation (3 units)

Course Description: Current status of species concepts, models of speciation, current research on speciation, and relevance of species to conservation biology.

Prerequisite(s): EVE 100 or PHI 108; or the equivalent; HPS 130B recommended.

Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s).

Grade Mode: Letter.

EVE 225 – Linear Mixed Modeling in Ecology & Evolution (4 units)

Course Description: Analysis of clustered data requires hierarchical or mixed statistical models. Conceptual basis and practical application of linear (mixed) models. Examples drawn from evolutionary and behavioral ecology. Hands-on manipulation and analysis of data in R.

Prerequisite(s): PLS 205 or equivalent coursework or experience with basic linear modelling is strongly recommended.

Learning Activities: Lecture 3 hour(s), Discussion/Laboratory 1 hour(s).

Grade Mode: Letter.

EVE 231 – Principles of Biological Data Analysis (3 units)

Course Description: Introduction to the principles of data analysis, experimental design, statistical modeling, inference, and hypothesis tests. Statistical methods of particular importance in biological applications will be emphasized. Examples will be presented from the fields of ecology and evolutionary genetics.

Learning Activities: Lecture 2 hour(s), Laboratory 3 hour(s).

Grade Mode: Satisfactory/Unsatisfactory only.

EVE 240 – Paleobotany & Angiosperm Evolution (4 units)

Course Description: Critical analysis of the plant fossil record as a source of evidence on origin, evolution, and phylogeny of the angio-sperms, Cretaceous and Tertiary climates, geographic history of modern taxa, and origin of modern vegetation types.

Prerequisite(s): PLB 108 or PLB 116 or EVE 140.

Learning Activities: Lecture 3 hour(s), Laboratory 3 hour(s).

Grade Mode: Letter.

EVE 290C – Research Conference (1 unit)

Course Description: Presentation and discussion of faculty and graduate student research in biology.

Prerequisite(s): Consent of instructor; graduate standing.

Learning Activities: Discussion 1 hour(s).

Repeat Credit: May be repeated.

Grade Mode: Satisfactory/Unsatisfactory only.

EVE 298 – Group Study (1-5 units)

Course Description: Group study.

Prerequisite(s): Consent of instructor.

Learning Activities: Variable.

Grade Mode: Satisfactory/Unsatisfactory only.

EVE 299 – Research (1-12 units)

Course Description: Research.

Prerequisite(s): Consent of instructor.

Learning Activities: Variable.

Grade Mode: Satisfactory/Unsatisfactory only.

EVE 390 – Methods of Teaching (2 units)

Course Description: Practical experience in the methods and problems of teaching. Includes analyses of texts and supporting material, discussion of teaching techniques and preparing and conducting of laboratory and discussion sections.

Prerequisite(s): Consent of instructor; graduate standing.

Learning Activities: Lecture 1 hour(s), Discussion 1 hour(s).

Repeat Credit: May be repeated 8 unit(s).

Grade Mode: Satisfactory/Unsatisfactory only.