ECOLOGY (ECL)

College of Agricultural & Environmental Sciences

ECL 200AN — Principles & Applications of Ecology (5 units)

Course Description: Covers principles of community structure and functioning, species diversity patterns, ecosystem ecology and biogeochemistry, landscape ecology, biogeography and phylogenetics.
Prerequisite(s): STA 102; MAT 016A; MAT 016B; or consent of instructor; first course in Ecology (e.g., ESP 100).
Learning Activities: Lecture 4 hour(s), Discussion 1 hour(s).
Enrollment Restriction(s): Pass One open to graduate majors.
Grade Mode: Letter.

ECL 200BN — Principles & Applications of Ecology (5 units)

Course Description: Provides a broad background in the principles and applications of ecology, and serves as a foundation for advanced ecology courses. Topics include ecophysiology, behavioral ecology, population ecology, genetics and evolution. Emphasis on historical developments, current understanding, and real world applications.
Prerequisite(s): STA 102; MAT 016A; MAT 016B; or consent of instructor; first course in Ecology (e.g., ESP 100).
Learning Activities: Lecture 4 hour(s), Discussion 1 hour(s).
Enrollment Restriction(s): Pass One open to graduate majors.
Grade Mode: Letter.

ECL 205 — Community Ecology (4 units)

Course Description: Introduction to literature and contemporary research into processes structuring ecological communities.
Prerequisite(s): An upper division course in Ecology (ECL).
Learning Activities: Lecture 2 hour(s), Discussion 2 hour(s).
Grade Mode: Letter.

ECL 206 — Concepts & Methods in Plant Community Ecology (4 units)

Course Description: Principles and techniques of vegetation analysis, including structure, composition, and dynamics. Emphasis given to sampling procedures, association analysis, ordination, processes and mechanisms of succession, and classification. Most techniques are demonstrated or conducted during field trips and laboratories.
Prerequisite(s): Consent of instructor; introductory courses in statistics and plant ecology.
Learning Activities: Lecture 3 hour(s), Laboratory 4 hour(s).
Grade Mode: Letter.

ECL 207 — Plant Population Biology (3 units)

Course Description: Introduction to theoretical and empirical research in plant population biology. Emphasis placed on linking ecological ecological and genetic approaches to plant population biology.
Prerequisite(s): Advanced undergraduate ecology course (e.g., ESP 100, EVE 101, ENT 104 or PLB 117), and advanced undergraduate course in genetics and/or evolution (e.g., BIS 101 or EVE 100).
Learning Activities: Lecture 2 hour(s), Discussion/Laboratory 1 hour(s).
Cross Listing: PBG 207.
Grade Mode: Letter.

ECL 208 — Issues in Conservation Biology (4 units)

Course Description: Graduate-level introduction to current research in conservation biology. Emphasizes reading and discussing primary literature. Specific topics will reflect the research interests of UC Davis conservation biology faculty.
Prerequisite(s): Introductory biology (e.g. BIS 002B) and an upper division organismal biology class.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.

ECL 212A — Environmental Policy Process (4 units)

Course Description: Introduction to selected topics of the policy process and applications to the field of environmental policy. Develops critical reading skills, understanding of policy theory, and an ability to apply multiple theories to the same phenomena.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Enrollment Restriction(s): Restricted to graduate standing.
Cross Listing: ESP 212A.
Grade Mode: Letter.

ECL 212B — Environmental Policy Evaluation (4 units)

Course Description: Method and practice, philosophical basis, and political role of policy analysis. Reviews basic concepts from economic theory; how and why environmental problems emerge in a market economy; and tools necessary for solving environmental problems.
Learning Activities: Lecture 4 hour(s).
Enrollment Restriction(s): Restricted to Graduate Standing.
Cross Listing: ESP 212B, ENV 200B.
Grade Mode: Letter.

ECL 214 — Marine Ecology: Concepts & Practice (3 units)

Course Description: Critical review and analysis of concepts and practices in modern marine ecology at the interface of several fields of study including oceanography, evolution, behavior, and physiology. Emphasis on critical thinking, problem solving, and hands-on study. Two field trips required.
Prerequisite(s): Consent of instructor. Graduate standing or one course in ecology, one course in evolution or genetics; survey course in marine ecology recommended.
Learning Activities: Lecture 1 hour(s), Discussion 1.50 hour(s), Fieldwork 1.50 hour(s).
Grade Mode: Letter.

ECL 215 — Social Ecological Systems (3 units)

Course Description: Overview of social-ecological systems that links environmental policy and decision-making to ecological processes. Delves deeper into different social science topics related to this broader idea. Applying of course readings to case studies chosen by students and a final paper.
Prerequisite(s): Completion of core courses for specific graduate programs, for example ECL 200A, ECL 200B.
Learning Activities: Lecture/Discussion 3 hour(s).
Grade Mode: Letter.

ECL 216 — Ecology & Agriculture (4 units)

Course Description: Ecological principles as relevant to agriculture. Integration of ecological approaches into agricultural research to increase ecosystem functions and services. Topics include crop autoecology, biotic interactions among crops and pests, ecosystem and landscape ecology.
Prerequisite(s): EVE 011; or consent of instructor.
Learning Activities: Lecture 3 hour(s), Term Paper.
Credit Limitation(s): Not open for credit to students who have completed VCR 216. (Former VCR 216).
Grade Mode: Letter.

ECL 219 — Ecosystem Biogeochemistry (4 units)

Course Description: Multi-disciplinary analysis of energy and nutrient transfers within terrestrial ecosystems. Examination of processes and inter- and intra-system interactions between the atmosphere, biosphere, lithosphere, and hydrosphere. Laboratory section uses biogeochemical simulation models to examine case studies.
Prerequisite(s): Introductory courses in ecology/biology and soils are recommended; undergraduates accepted with consent of instructor.
Learning Activities: Lecture 3 hour(s), Discussion/Laboratory 2 hour(s).
Cross Listing: SSC 219.
Grade Mode: Letter.

ECL 224 — Data Management & Visualization in R (3 units)

Course Description: Introduction to programming and data analysis in R. Workflow (version control, markdown, reading and writing data), object-oriented programming, statistical analysis, and visualization.
Learning Activities: Lecture 2 hour(s), Laboratory 2 hour(s).
Cross Listing: ENV 224.
Grade Mode: Letter.

ECL 225 — Terrestrial Field Ecology (4 units)

Course Description: Field course conducted over spring break and four weekends at Bodega Bay, emphasizing student projects. Ecological hypothesis testing, data gathering, analysis, and written and oral presentation of results are stressed.
Prerequisite(s): Introductory ecology and introductory statistics or consent of instructor.
Learning Activities: Seminar 1 hour(s), Fieldwork 12 hour(s).
Cross Listing: ENT 225, PBG 225.
Grade Mode: Letter.

ECL 231 — Mathematical Methods in Population Biology (3 units)

Course Description: Mathematical methods used in population biology. Linear and nonlinear difference equation and differential equation models are studied, using stability analysis and qualitative methods. Partial differential equation models are introduced. Applications to population biology models are stressed.
Prerequisite(s): MAT 016C or MAT 021C; or the equivalent.
Learning Activities: Lecture 3 hour(s).
Cross Listing: PBG 231.
Grade Mode: Letter.

ECL 232 — Theoretical Ecology (3 units)

Course Description: Examination of major conceptual and methodological issues in theoretical ecology. Model formulation and development will be emphasized. Topics differ from year to year.
Learning Activities: Lecture 3 hour(s).
Repeat Credit: May be repeated.
Grade Mode: Letter.

ECL 233 — Computational Methods in Population Biology (3 units)

Course Description: Numerical methods for simulating population dynamics using the computational software package R. Emphasis placed on model formulation and development, theoretical concepts and philosophical principles to guide simulation efforts, model parameterization, and implementing simulations with R.
Prerequisite(s): A course in theoretical ecology (e.g., ECL 231 or an equivalent to ESP 121 from your undergraduate institution) or consent of instructor; no programming experience required.
Learning Activities: Lecture/Lab 2 hour(s), Discussion/Laboratory 1 hour(s).
Cross Listing: PBG 233.
Grade Mode: Satisfactory/Unsatisfactory only.

ECL 234 — Bayesian Models: A Statistical Primer (4 units)

Course Description: Practical model-building skills and intuition in statistical modeling. Construction of accurate mathematical expressions to link observation to specific hypotheses. For researchers in the natural and social sciences.
Prerequisite(s): EVE 231 or PLS 205 or PLS 120 or EVE 225; or consent of instructor; experience with basic linear modeling and R coding strongly recommended.
Learning Activities: Lecture 3 hour(s).
Grade Mode: Letter.

ECL 243 — Ecological Genomics (4 units)

Course Description: Genomics concepts, technologies, and analyses for ecology research. Mixture of lecture, discussion of recent literature, hands-on training in data analysis and experimental design, and research proposal preparation and evaluation. One all-day field trip is required.
Prerequisite(s): ECL 242; or equivalent training in ecology and genetics according to the discretion of the instructors.
Learning Activities: Lecture/Discussion 3 hour(s), Term Paper/Discussion.
Grade Mode: Letter.

ECL 245 — Climate Change, Water & Society (4 units)

This version has ended; see updated course, below.
Course Description: Integration of climate science and hydrology with policy to understand hydroclimatology and its impact upon natural and human systems. Assignments: readings, take-home examination on climate and hydrologic science, paper that integrates course concepts into a research prospectus or review article.
Learning Activities: Lecture 4 hour(s).
Enrollment Restriction(s): Limited to 25 students.
Cross Listing: HYD 245, ATM 245.
Grade Mode: Letter.

ECL 245 — Climate Change Science & Impacts (4 units)

Course Description: Overview of climate change science with a focus on climate change communication. Impacts of climate change on water, agriculture, energy, health, infrastructure, ecosystem services, tribal and indigenous communities. Climate justice, political, societal, and economic dimensions of these issues.
Learning Activities: Lecture 3 hour(s), Project.
Cross Listing: HYD 245, ATM 245.
Grade Mode: Letter.
This course version is effective from, and including: Fall Quarter 2024.

ECL 262 — Advanced Population Dynamics (3 units)

Course Description: Logical basis for population models, evaluation of simple ecological models, current population models with age, size, and stage structure, theoretical basis for management and exemplary case histories. Emphasis on development and use of realistic population models in ecological research.
Prerequisite(s): Graduate standing; advanced course in ecology (e.g., EVE 101), population dynamics (e.g., WFC 122), and one year of calculus; familiarity with matrix algebra and partial differential equations recommended.
Learning Activities: Lecture 3 hour(s).
Cross Listing: WFC 262.
Grade Mode: Letter.

ECL 271 — Research Conference in Ecology (1 unit)

Course Description: Critical presentation and evaluation of current literature and ongoing research in ecology. Requirements include active participation in weekly discussions and the presentation of a paper or chapter once per quarter.
Prerequisite(s): Consent of instructor.
Learning Activities: Seminar 1 hour(s).
Repeat Credit: May be repeated.
Cross Listing: PBG 271.
Grade Mode: Satisfactory/Unsatisfactory only.

ECL 280 — Current Anthropology Journal Editorial Workshop (4 units)

Course Description: Reading and offering workshop critiques of manuscripts submitted for publication, and reading and discussion of other relevant work in anthropology and human ecology. Track and edit published comments and authors' replies that accompany major features. Participation in the development of new sections for the electronic edition of the journal, including a "news and views" section and a debate section.
Prerequisite(s): Consent of instructor.
Learning Activities: Workshop 1 hour(s), Independent Study 3 hour(s).
Enrollment Restriction(s): Students must enroll for all three quarters.
Repeat Credit: May be repeated 12 unit(s) with consent of instructor.
Cross Listing: ANT 280.
Grade Mode: Satisfactory/Unsatisfactory only.

ECL 290 — Seminar in Ecology (1-4 units)

Course Description: Topics in ecology. Students are expected to present an oral seminar on a particular aspect of the general topic under consideration.
Prerequisite(s): Consent of instructor.
Learning Activities: Seminar 1-4 hour(s).
Grade Mode: Satisfactory/Unsatisfactory only.

ECL 296 — Topics in Ecology & Evolution (1 unit)

Course Description: Seminars presented by visiting lecturers, UC Davis faculty, and graduate students.
Prerequisite(s): Graduate standing.
Learning Activities: Seminar 1 hour(s).
Repeat Credit: May be repeated.
Cross Listing: PBG 292.
Grade Mode: Satisfactory/Unsatisfactory only.

ECL 297T — Tutoring in Ecology (1-4 units)

Course Description: Teaching ecology including conducting discussion groups for regular departmental courses under direct guidance of staff.
Prerequisite(s): Consent of instructor; graduate standing in ecology.
Learning Activities: Lecture 1 hour(s), Discussion 1 hour(s).
Repeat Credit: May be repeated.
Grade Mode: Satisfactory/Unsatisfactory only.

ECL 298 — Group Study (1-5 units)

Course Description: Group study.
Learning Activities: Variable.
Grade Mode: Satisfactory/Unsatisfactory only.

ECL 299 — Research (1-12 units)

Course Description: Research.
Prerequisite(s): Consent of instructor; graduate standing.
Learning Activities: Variable.
Grade Mode: Satisfactory/Unsatisfactory only.