

BIOLOGY (BIOL)

BIOL 101 Life Science: The Human Environment

Examines principles of biology and ecology that will help students function more effectively in a complex, technological society. We explore the power and use of the scientific method and examine current scientific discoveries as they affect the world's diverse cultures. We examine our environment and how we are modifying it, the cell as the basic unit of life, reproduction, genetics, evolution, anatomy and physiology, and the diversity of the life. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

BIOL 199 Independent Study

An independent study course is a course initiated and written by a student that deals with material not covered in any approved catalog course. The student works independently under the guidance of an instructor who must approve the student's comprehensive written plan and time line before the student can begin. An independent study form must be signed by the department chairperson prior to commencement of the study. Independent studies are available only to matriculated students in good standing at ULV. Traditional undergraduates may register for independent studies only during the normal registration period; CAPA and graduate students may register for them through the end of the "special course" registration period; RCA students, until the last day to withdraw from a course. May be taken multiple times with a different topic for credit. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 1-4

BIOL 201 General Biology I

Environmental and behavioral biology, classification, and evolutionary adaptations of plants and animals. Includes lab and fieldwork. Required of Biology Majors, premedical, pre dental, and pre-nursing students. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

BIOL 202 General Biology II

Cellular and molecular biology, physiology, and genetics. Includes lab and fieldwork. Required of Biology Majors, premedical, pre dental, and pre-nursing students.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

BIOL 204 Plant Biology

This course is a study of plants including cell structure, biochemical/molecular make-up, metabolism, physiology, anatomy and development. Plant Biology also explores the diversity of plants through the lens of evolution, genetics and ecology. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

BIOL 205 Animal Biology

Introduces animal biology. Focuses on diversity, growth, development, behavior, ecology, evolution, structure and function, and phylogenetic relationships. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

BIOL 299 Independent Study

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Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 1-4

BIOL 302 Microbiology

Prerequisite: Completion of Natural World: Life Science
General study of microorganisms with attention to practical importance of bacteria, yeasts, and molds and the laboratory methods involved in handling, isolating, and identifying unknowns. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

BIOL 305 Vertebrate Zoology

Prerequisite: Completion of BIOL 201 and BIOL 202
The course will consist of a survey of the vertebrates beginning with non-vertebrate Chordate taxa and culminating with mammals. Pre-vertebrate chordates, fishes (jawless, cartilaginous and bony), amphibians, reptiles, mammals and birds will be studied independently and comparatively to learn diagnostic attributes and the role they play in global ecosystems. Emphasis will be placed on vertebrate structure and function, ecology, and evolution. A laboratory requiring field-work, and investigations of vertebrate structure, function, and identification is required. This course is not challengeable.

Semester Hours: 4

BIOL 310 Cell Biology

Prerequisite: Completion of two of the following: BIOL 201, BIOL 202, BIOL 204 or BIOL 205
Structure and function of cellular organelles, cellular metabolism, gene expression, and regulation. Historical and experimental emphasis. Lab Included.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

BIOL 311 Genetics

Prerequisite: Completion of two of the following: BIOL 201, BIOL 202, BIOL 204 or BIOL 205
This course emphasizes two main topics, transmission and molecular genetics to explain principles of heredity and the existence of diverse phenotypes. Time is also spent on population genetics to understand the impact of shifting gene pools on populations.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

BIOL 312 Environmental Biology**Prerequisite:** Completion of BIOL 323

The balance of forces that operate to maintain stability within the ecosphere. Methods of preserving natural resources through education, research, and public action. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 313 Developmental Biology**

Embryonic development in various organisms. Mechanisms underlying fertilization, differentiation, induction, and teratogenesis. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 314 Biochemistry****Prerequisite:** Completion of CHEM 311

Introduces biochemical diversity and function, as well as metabolism. Covers all major catabolic and anabolic pathways, including synthesis of major groups of secondary metabolites. Enzymology and control mechanisms are introduced along with signaling pathways, biochemical "machines" and other complexes. A comprehensive lab is included. Also CHEM 314. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 5**BIOL 316 Molecular Biology****Prerequisite:** Completion of BIOL 311

Surveys molecular biology of the cell (including replication, transcription, translation and the regulation of gene expression) and techniques such as Western blotting, PCR, Southern blotting, and molecular cloning. Lab included. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 322 Marine & Freshwater Biology****Prerequisite:** Completion of a Life Science GE course (LVLS) and completion of BIOL 323

Ecological study of fresh-water, estuarine, and marine systems. Effects of thermal, chemical, and radioactive pollutants in aquatic ecosystems. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 323 Ecology****Prerequisite:** Completion of BIOL 201 or 205 and BIOL 202 or BIOL 204

Ecology is the study of the interactions between organisms and their environment. This course provides background in the fundamental principles of ecological science including those governing energy flow, nutrient cycling, community structure and organization, succession, population dynamics, and evolution. Students will develop their ecological literacy about how the natural world works and understand how scientific methods are used to construct ecological knowledge. Letter grade only. Not challengeable.

Semester Hours: 2**BIOL 325 Field Biology**

Ecological field investigations including identification, sampling techniques and equipment, data analysis, population dynamics, and behavior. Each course offering typically focuses on a particular biotic habitat or organismal group. Offered on both the ULV home campus and at the Maggie Ranch. Course may be repeated two times for a total of 6 credit hours.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 1,2**BIOL 327 Mountain and Desert Biology****Prerequisite:** Completion of BIOL 202 or BIOL 204 and BIOL 201 or BIOL 205, and completion of BIOL 323

Comparative survey of flora, fauna, and geography of mountain and desert biomes. Dynamics of community organizations, and effect of man and his responsibility to these changing environments. Lab and field trips included. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 333 Animal Physiology**

Study of animal organ and tissue functions. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 334 Ornithology****Prerequisite:** Completion of Natural World: Life Science

Systematic, distributional, behavioral, and ecological study of shore, fall migratory, and canyon birds of Southern California. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 343 Human Anatomy****Prerequisite:** Completion of BIOL 101 or BIOL 201 or BIOL 202 or BIOL 204 or BIOL 205

Integrated study of the gross and microscopic anatomy of the human body. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 344 Human Physiology****Prerequisite:** Completion of BIOL 343

Studies human body function. Emphasizes homeostasis. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 345 Immunology****Prerequisite:** Completion of BIOL 310

Emphasizes experimental foundation of immunology. Covers elements of the immune system, principles of innate and adaptive immunity, molecular and cellular structure/function, development of the immune system, and normal/abnormal immune responses. Laboratory is a CURE (course-based undergraduate research experience) focused on environmental impacts on immune system development using current immunological research techniques. Letter grade only. Not challengeable.

Semester Hours: 4

BIOL 346 Molecular Basis of Disease**Prerequisite:** Completion of CHEM 202

Examines mechanisms of genetic, bacterial, viral, and prion diseases, and individual diseases such as cystic fibrosis, AIDS, Scrapie, and cholera.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 350 Introduction to Computational Biology****Prerequisite:** Completion of BIOL 201, 202, 379, and 382 or 383

The course introduces students to fundamentals of bioinformatics and computational biology, focusing on data analysis in a modern genomic laboratory. The students will learn basic programming approaches to solve bioinformatics problems. The students will become familiar with genomic databases, their organization and usage. Letter grade only. Not challengeable.

Semester Hours: 4**BIOL 361 Plant Physiology****Prerequisite:** Completion of CHEM 201 or CHEM 202

Completion of or concurrent enrollment in BIOL 204. Principles of plant physiology, as applied to photosynthesis, mineral absorption and utilization, water relations, translocation, respiration, metabolism, and the role of plant hormones in control of growth and development. Lab included.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 376 Human and Environmental Toxicology****Prerequisite:** Completion of BIOL 101 or BIOL 204 or BIOL 205

Covers principles and mechanisms of toxicology. Emphasizing agents likely to be encountered in industry and the environment. Includes pathology, toxicity determination, dose response, hazard and risk assessment, and transfer and transformation of toxins in the environment.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4**BIOL 378 Evolution and Biosystematics****Prerequisite:** Completion of BIOL 311

Examines the historical, philosophical, and conceptual bases of evolutionary principles and processes.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 2**BIOL 379 Research Methods****Prerequisite:** Completion of BIOL 201 or BIOL 205 and BIOL 202 or BIOL 204

Introduces research methods. Includes hypothesis development, experimental design, data analysis, presentation, and the use, interpretation, and presentation of descriptive and inferential statistics. Includes Science Seminar.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 2**BIOL 380 Biostatistics****Prerequisite:** Completion of BIOL 202 or BIOL 204 and BIOL 201 or BIOL 205 and BIOL 379

Topics covered include data analysis, the use, interpretation, and presentation of descriptive and inferential statistics and their applications in Biology, proposal design, and grant writing. Participation in Science Seminar required. Course is not challengeable.

Grade Mode: Letter, Audit**Semester Hours:** 2**BIOL 381 Research Writing in the Sciences****Prerequisite:** Written Communication B

This course focuses on analysis and practice of various forms of scientific discourse, with attention to research methods, design of papers, technical style, citation conventions, and editing strategies. Students develop their command of scientific discourse through multi-stage writing processes, rhetorical communication, active in-class learning workshops, peer review, and individual feedback. Also WRT 380. Not challengeable.

Grade Mode: Letter, Credit/No Credit**Semester Hours:** 2**BIOL 382 Statistics for Life Sciences****Prerequisite:** MATH 105

The students will gain theoretical and practical skills needed for data analysis in life sciences. Fundamentals of probability and statistics will be covered, with emphasis on principles of inferential statistics. The students will learn hypothesis testing, data analysis and visualization. Letter grade only. Not challengeable.

Semester Hours: 2**BIOL 383 Statistics and Applications for Life Sciences****Prerequisite:** MATH 201

The course covers theoretical and practical concepts of modern statistical analysis in application to research life sciences. The course will equip the students with necessary skills to design experiments, analyze, visualize and present the results. The course will cover descriptive and inferential statistics and teach students to use computer tools to implement statistical analysis. Letter grade only. Not challengeable.

Semester Hours: 4**BIOL 385 Community-Engaged Health Research****Prerequisite:** BIOL 201 or BIOL 205 and BIOL 202 or BIOL 204

This upper division course introduces students to community-based health research through Service Learning. Students will learn theory and practice in community health research by participating in a community health research project, documenting and reporting findings. Students will work within a Participatory Action Research model in the 2 unit version of the class, and with PAR and conventional research in the 4 unit version. This course fulfills the Community Service (LVCS) requirement and requires 40 hours of community service. Letter grade only. Not challengeable.

Semester Hours: 2,4**BIOL 390 Natural History of the Tropics**

Studies natural history of a tropical habitat. Also includes flora, fauna, geology, and history. Lab and fieldwork course. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit**Semester Hours:** 4

BIOL 390F Natural History of the Tropics Fieldwork Course

Prerequisite: Completion of or concurrent enrollment in BIOL 390
See BIOL 390 - The Natural History of the Tropics. May be taken multiple times for credit. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit

Semester Hours: 2

BIOL 399 Independent Study

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Grade Mode: Letter, Credit/No Credit, Audit

Semester Hours: 1-4

BIOL 441 Nutrition

Family and institutional food planning and health programs. Emphasizes nutritional needs, holistic health, and diet. Also EDUC 422.

Grade Mode: Letter, Credit/No Credit, Letter, Credit/No Credit, Audit

Semester Hours: 2

BIOL 490 Selected Topics in Biology

Studies in areas not addressed in other courses. May be taken six times for credit. May be taken for letter grade only.

Grade Mode: Letter, Letter, Audit

Semester Hours: 1-4

BIOL 499 Senior Seminar/Project

Culminating activity required by majors in all departments. Papers/theses/projects researched, prepared, and written under the guidance of a faculty member. Comprehensive exams or recitals required in some departments. Academically, Students must be in Good Standing to enroll in 499. May be taken for letter grade only. Not challengeable.

Semester Hours: 0

BIOL 499A Senior Seminar/Project

Culminating activity required by majors in all departments. Papers/theses/projects researched, prepared, and written under the guidance of a faculty member. Comprehensive exams or recitals required in some departments. Academically, Students must be in Good Standing to enroll in 499. May be taken for credit/no credit only. Not challengeable.

Semester Hours: 1

BIOL 499B Senior Seminar/Project

Prerequisite: Completion of BIOL 499A

A continuation of BIOL 499A. Culminating activity required by majors in all departments. Papers/theses/projects researched, prepared, and written under the guidance of a faculty member. Comprehensive exams or recitals required in some departments. Academically, Students must be in Good Standing to enroll in 499. May be taken for letter grade only. Not challengeable.

Semester Hours: 1-3