

# Biology

## LOWER DIVISION

**BIOL 102. Human Biology** (3). The human animal as a biological entity: structure, function, health and disease, evolution and behavior. *Not intended for majors in science, natural resources, or kinesiology.* [Weekly: 3 hrs lect. B-LD]

**BIOL 102L. Human Biology Lab** (1). Laboratory focusing on human anatomy, physiology, and genetics. *Not intended for majors in science, natural resources, or kinesiology.* [Coreq: BIOL 102. Weekly: 3 hrs lab. B-LD]

**BIOL 104. General Biology** (3). Principles of modern biology. Emphasis on aspects of biology rapidly reshaping our culture. *Not intended for majors in science or natural resources.* [Weekly: 2 hrs lect, 3 hrs lab. B-LD.]

**BIOL 105. Principles of Biology** (4). Fundamental processes of life. Structure and function of cells, genetics, evolution, and ecology. [Prereq: CHEM 107 or CHEM 109 with a grade of C- or higher. Weekly: 3 hrs lect, 3 hrs lab. B-LD.]

**BIOL 180 / BIOL 180A / BIOL 180L. Selected Topics in Biology** (1-3). Topics of current interest supplemental to established lower division curricular offerings. [Prereq: IA. Rep.]

**BIOL 198. Supplemental Instruction** (1). Collaborative work for students enrolled in introductory biology. [CR/NC. Rep.]

**BIOL 210. Medical Microbiology** (4). Classification, physiology, and pathogenesis of human disease caused by bacteria, protozoa, fungi, and virus. Theories of diagnosis, treatment, immunity, and prophylaxis. Lab training in cultivation, identification, diagnosis. [Weekly: 3 hrs lect, 3 hrs lab. Prereq: BIOL 104 or BIOL 105 with a grade of C- or higher.]

**BIOL 255. Marine Biology** (3). The study of life in marine environments (kelp beds, rocky shores, salt marshes, coral reefs, deep sea). Emphasis on marine organisms and the processes that structure marine communities and ecosystems, their productivity and conservation. [Prereq: (OCN 109 (if taken prior to fall 2015) or OCN 109 and OCN 109L); BIOL 105 or BOT 105 or ZOOL 110. Weekly: 2 hrs lect, 3 hrs lab.]

**BIOL 280 / BIOL 280L. Selected Topics in Biology** (1-3). Topics of current interest supplemental to established lower division curricular offerings. [Prereq: IA. Rep.]

## UPPER DIVISION


**BIOL 301. History of Biology** (3). How key ideas in biology developed from antiquity to present. Sociocultural influences on biology; effects of biological discoveries on society. Intended for non-majors. Cannot be used to satisfy major or minor requirements in the Department of Biological Sciences. [Prereq: completed lower division GE science. Weekly: 3 hrs lect. B-UD.]

**BIOL 304. Human Genetics** (3). Heredity in humans. Sexuality/reproduction; nature and activities of genes and chromosomes; behavioral genetics; genetic disorders; modern biomedical genetics. Intended for non-majors. Cannot be used to satisfy major or minor requirements in the Department of Biological Sciences. [Prereq: completed lower division science GE. DCG-n. B-UD.]

**BIOL 305. Social Behavior & Biology** (3). Social behavior and biology of animals, including humans. Social grouping; communication; sexual and parental behavior; reciprocity; altruism; aggression and dominance. Intended for non-majors. Cannot be used to satisfy major or minor requirements in the Department of Biological Sciences. [Prereq: completed lower division science GE. B-UD.]

**BIOL 306. California Natural History** (3). Human interaction with the natural world as seen by biologists. Identify plants or animals and habitats of northern California. Intended for non-majors. Cannot be used to satisfy major or minor requirements in the Department of Biological Sciences. [Prereq: completed lower division science GE. Weekly: 2 hrs lect/disc, 3 hrs lab/field trip. B-UD.]

**BIOL 307. Evolution** (4). Properties and differentiation of populations. Population genetics; mechanisms of species formation; and macroevolution. [Prereq: BIOL 340. Weekly: 3 hrs lect, 1 hr disc. B-UD.]

 **BIOL 308. Environment & Culture: How People Transformed a Continent** (3). How different cultures have altered ecological systems in the U.S. From the influence of Native Americans on ecosystems to how expansion of European colonists and contemporary culture effects our environment. Intended for non-majors. Cannot be used to satisfy major or minor requirements in the Department of Biological Sciences. [Prereq: completed lower division science GE. B-UD.]

**BIOL 330. Principles of Ecology** (4). Major ideas shaping modern ecology: population regulation, competition, predation, ecosystem energetics, mathematical models, and nutrient cycling. Role of biological and physical factors in developing community structure. [Prereq: BIOL 105; STAT 108 or STAT 108i or STAT 109; BOT 105 or ZOOL 110; all with grades of C- or higher. Weekly: 3 hrs lect, 3 hrs lab.]

**BIOL 335. Field or Laboratory Problems** (1-2). Individual work in field or lab research. [Prereq: IA. Rep once.]

**BIOL 340. Genetics** (4). Principles of heredity; nature and function of genetic material, with quantitative analyses; genetic constitution of populations. [Prereq: BIOL 105 and (STAT 108 or STAT 108i or STAT 109 or CHEM 341); all with grades of C- or higher. Weekly: 3 hrs lect, 3 hrs lab.]

**BIOL 350. Cell Biology** (3). Study of the structure and function of cells with emphases in biochemistry, molecular biology, and physiology, and methods used to address relevant questions in the field. [Prereq: BIOL 340 and (PHYX 106 or PHYX 109.)

**BIOL 369. Professional Writing in the Life Sciences** (4). Writing scientific papers for publication. Theses, journal articles, reviews, grant applications, technical reports. [Weekly: 2 hrs lect, 2 hrs activ.]

**BIOL 380 / BIOL 380L. Selected Topics in Biology** (1-3). Topics of current interest supplemental to established upper division curricular offerings. [Prereq: IA. Rep.]

**BIOL 399. Supplemental Work in Biology** (1-3). Directed study for transfer student whose prior coursework is not equivalent to corresponding HSU courses. [Department and instructor approval required. Rep once.]


**BIOL 412. General Microbiology** (4). Natural history and importance of bacteria, archaea, and viruses. Structure, growth, metabolism, genetics, taxonomy, diversity pathogenesis and applied aspects of microorganisms. [Prereq: BIOL 340 with a grade of C- or higher. Weekly: 2 hrs lect, 6 hrs lab.]

**BIOL 418. Marine Microbiology** (3). Biology, behavior and function of microorganisms in diverse marine habitats, roles in ecological processes. Laboratory: isolation, molecular and ecological approaches to microbial processes. [Prereq: BIOL 340 with a grade of C- or higher. Weekly: 2 hrs lect, 3 hrs lab.]

**BIOL 430. Intertidal Ecology** (3). Ecological principles as applied in coastal marine habitats: rocky shores, sandy beaches, bay flats, and nearshore waters. Numerous field trips; one weekend trip. Individual and group studies a major part of lab work. [Prereq: BIOL 330 and ZOOL 314, or their equivalents; all with a grade of C- or higher. Weekly: 2 hrs lect, 3 hrs lab.]

**BIOL 433. Microbial Ecology** (3). This course explores the biology, behavior, and function of microorganisms in natural environments with attention to their role in ecologically and environmentally significant processes. [*Must co-enroll in BIOL 433D.* Prereq: BIOL 412 or (BIOL 340 and BIOL 330). Weekly: 2 hrs lect, 3 hrs lab. One weekend fieldtrip. Service fee.]

**BIOL 433D. Microbial Ecology Discussion** (1). This discussion explores the biology, behavior, and function of microorganisms in natural environments (to be taken in conjunction with BIOL 433 lecture and lab). [Prereq: BIOL 412 or (BIOL 340 and BIOL 330).]

 **BIOL 434 / BIOL 534. Population & Community Ecology** (4). The study of the structure and distribution of populations and communities. Topics include population viability modeling, metapopulation dynamics, mark-recapture techniques, species interactions, trophic dynamics, assembly rules, biodiversity, and conservation issues. [Prereq: BIOL 330 or WLDF 301. Weekly: 3 hrs lect, 3 hrs lab.]

**BIOL 438. Field Ecology** (4). A capstone experience in field ecology for advanced undergraduates majoring in Biology with an Ecology emphasis and a preparatory experience for graduate students entering advanced studies in ecology. [Prereq: BIOL 330 with a grade of C- or higher. Weekly: 2 hrs lect, 6 hrs lab/fieldtrip.]

**BIOL 440. Molecular Genetics Lab** (2). Experiments in modern and classical genetics, using a variety of organisms. [Prereq: BIOL 340 or equivalent with a grade of C- or higher.]

**BIOL 448. Biogeography** (3). Past/present geographic distribution of animal and plant groups. Emphasis on vertebrate animals and vascular plants. [Prereq: BIOL 330.]

**BIOL 450. Cell Biology Laboratory** (2). Experiments in modern and classical cellular and molecular biology, cellular physiology, and biochemistry of cells using cell culture models. [Prereq: BIOL 350 with a grade of C- or higher.]

**BIOL 480 / BIOL 480L. Selected Topics in Biology** (1-3). Topics in current advances as demand warrants. [Prereq: IA. Rep once with different topic and instructor.]

**BIOL 482. Supervised Internship** (1-12). Students implement the theory and practice of their major my working for a public agency or private firm/organization. [Prereq: IA. Rep twice.]

**BIOL 484. Current Topics in Biology** (1). The latest biological research examined through weekly seminar presentations by biologists. [CR/NC. A maximum of one unit of this course may be counted toward a major in the biological sciences. Rep.]

**BIOL 490. Senior Thesis** (1-2). Thesis based on student-designed project approved by advisor. Approval must occur before enrollment. [Prereq: senior standing and IA. Rep once.]

**BIOL 498. Marine Biology Capstone Research** (2). Independent research conducted under faculty supervision. [Prereq: BIOL 255, BIOL 330, ZOO 314, senior standing in Marine Biology program.]

**BIOL 499. Directed Study** (1-2). Individual work for senior students showing special aptitude. Conference, reading, research. [Prereq: IA. Rep once.]

## GRADUATE

**BIOL 533. Microbial Ecology** (3). This course explores the biology, behavior, and function of microorganisms in natural environments with attention to their role in ecologically and environmentally significant processes. [Must co-enroll in BIOL 533D. Prereq: BIOL 412 or (BIOL 340 and BIOL 330). Weekly: 2 hrs lect, 3 hrs lab. One weekend fieldtrip. Service fee.]

**BIOL 533D. Microbial Ecology Discussion** (1). This discussion explores the biology, behavior, and function of microorganisms in natural environments (to be taken in conjunction with BIOL 533 lecture and lab). [Prereq: BIOL 412 or (BIOL 340 and BIOL 330).]

**BIOL 534 / BIOL 434. Population & Community Ecology** (4). The study of the structure and distribution of populations and communities. Topics include population viability modeling, metapopulation dynamics, mark-recapture techniques, species interactions, trophic dynamics, assembly rules, biodiversity, and conservation issues. [Prereq: BIOL 330 or WLD 301. Weekly: 3 hrs lect, 3 hrs lab.]

**BIOL 544. Stem Cell Biology** (2). Stem cell biology, maintenance, differentiation, and applications to science and medicine. Includes extensive review and analysis of primary scientific literature. Discussion topics will include regenerative medicine, science policy, and ethics. [Letter grade only. Prereq: BIOL 450 with a grade of C- or higher and senior standing or higher. Rec: BIOL 440, ZOO 476 and (CHEM 434 or CHEM 438).]

**BIOL 544L. Stem Cell Biology Lab** (2). Training in laboratory methods of embryonic stem cell culture maintenance, characterization, and differentiation. [Letter grade only. Coreq: BIOL 544.]

**BIOL 548. Biogeography** (3). Past/present geographic distribution of animal and plant groups. Emphasis on vertebrate animals and vascular plants. [Prereq: BIOL 330.]

**BIOL 550. Systematics** (3). Detect, describe, and explain biological diversity. Explore evolutionary, numerical, and cladistic approaches to classifying organisms and assessing their relationships. [Prereq: upper division survey courses in animals or plants or IA. Rec: BIOL 307.]

**BIOL 554. Plant/Animal Interactions** (3). Current research in pollination biology and plant/herbivore relations. Critique journal articles. [Prereq: STAT 108 or STAT 108i or STAT 109 or equivalent. Rep.]

**BIOL 564. Transmission and Scanning Electron Microscopy** (4). Transmission and scanning electron microscopy theory and technique. Preparation of materials, operation of electron microscopes, conduct an EM-based independent research project utilizing both systems. [Prereq: IA required, BOT 105, BIOL 105, ZOO 110.]

**BIOL 580 / BIOL 580L. Selected Topics in Biology** (1-3). Topics on current advances as demand warrants. [Prereq: grad standing and IA. Lect./lab as appropriate. Rep once.]

**BIOL 597. Methods in Laboratory Instruction** (2). Develop a "toolkit" of strategies and techniques to support student learning. Newly hired teaching associates in the Department of Biological Sciences are strongly encouraged to take this course. Course meets pre-semester for two-day immersion and weekly discussion. [CR/NC. Prereq: Graduate Standing.]

**BIOL 683. Introduction to Graduate Studies** (1). Orientation to research opportunities. Plan and develop master's project. Beginning grad students should enroll at earliest opportunity. [Prereq: acceptance into master's program in biology. Weekly: 1 hr seminar/recitation.]

**BIOL 684. Introduction to Graduate Research** (1). Orientation to research opportunities, funding, and planning. Develop and present a research proposal with peer review. [Prereq: BIOL 683 or classified grad standing in biology.]

**BIOL 685. Seminar in Biology** (1). Review and report on current literature and problems. [Prereq: grad standing. Rep.]

**BIOL 690. Thesis** (1-4). Individual work on thesis required for master's degree. [Prereq: consent of major advisor. Rep.]

**BIOL 699. Independent Study** (1-4). Individual work on appropriate topic. [Prereq: consent of advisor. Rep.]

## CREDENTIAL/LICENSURE

**BIOL 700. In-Service Professional Training in Biology** (1-3). Directed studies for biology professionals desiring advanced or specialized instruction, especially that leading to credentialing and certification. [Prereq: IA. Rep once.]