**BIOL 162. Comparative Animal Physiology (3)**
Prerequisite: BIOL 102 and 103. Evolution of physiological systems; functional adaptations to different environments; physiological principles as applied to animals. (3 lecture) (Formerly PHYAN 151)

**BIOL 162L. Comparative Animal Physiology Lab (1)**
Prerequisite: BIOL 102 and 103. BIOL 162 is a pre- or co-requisite. Comparative experimental approach to understanding how animals adapt to different environmental challenges and investigations into physiological processes. (3 lab hours) (Formerly PHYAN 151 lab component)

**BIOL 163. Advanced Human Physiology (3)**
Prerequisites: BIOL 103 and either BIOL 65 or equivalent. Primarily for students in biology and in the health professions. Advanced study of the cardiovascular, respiratory, excretory, and digestive systems. Concepts explaining normal functioning will be emphasized, with presentation of supporting scientific data. Integration of function of organ systems will be illustrated through study of specific examples, such as exercise. (Formerly PHYAN 163)

**BIOL 164. Hematology (3)**
Prerequisite: BIOL 103; BIOL 65 and 157 recommended. Development, structure, identification, and quantification of cellular blood elements; qualitative and quantitative considerations of hemoglobin, coagulation, and immunohematology. (Formerly PHYAN 162)

**BIOL 165. Endocrinology (3)**
Prerequisite: BIOL 102 and 103. A systems approach to the study of hormone synthesis, secretion, function as intercellular signals, and their role in both controlling and integrating normal physiological processes. (Formerly PHYAN 165)

**BIOL 166. Neurophysiology (3)**
Prerequisites: BIOL 33 or 64 or 65 or 103 or 162. Function of the human nervous system with emphasis on molecular mechanisms of electrical and chemical signaling. (Formerly PHYAN 140)

**BIOL 167. Pathophysiology (3)**
Prerequisite: BIOL 65 or equivalent or BIOL 163. An application of anatomic and physiologic principles in the study of those disturbances that underlie the etiology and pathogenesis of human diseases. (Formerly PHYAN 172)

**BIOL 171. Terrestrial Ecology (4)**
Prerequisite: BIOL 101. The interaction of organisms and communities with the physical and biotic environment, with emphasis on the biotic communities of Central California. (3 lecture, 3 lab or field hours)* (Formerly ECOL 151)

**BIOL 172. Aquatic Ecology (4)**
Prerequisite: BIOL 101. Physical-chemical features of inland waters as related to their biology; community structure and function, ecological interactions, adaptations, and identification of aquatic organisms. (3 lecture, 3 lab or field hours)* (Formerly ECOL 152)

**BIOL 173. Marine Biology (3)**
Prerequisite: BIOL 1B or BIOL 12. Introduction to the marine environment with emphasis on the biological aspects; systematics, ecology, and morphological and physiological adaptations of marine organisms, especially intertidal and shallow water forms; pollution; utilization of marine resources. (One field trip required) (Formerly ECOL 135)

**BIOL 174. Animal Behavior (3)**
Prerequisite: BIOL 101; one additional course in ecology or natural history recommended. Principles of ethology with emphasis on mechanisms of behavior. (2 lecture, 3 lab hours)* (Formerly ZOOL 152)

**BIOL 175. Ecology Case Study (3)**
Prerequisite: BIOL 101. Discussion-based course focusing on analysis and problem-solving in ecology. Cases are grounded in basic ecological and environmental science, but include relevance and application to sociological, economic, and political considerations. (2 hours lecture; 1 hour TBA) (Formerly BIOL 189T, ECOL 140)

**BIOL 176. Field Methods in Ecology (3)**
Prerequisite: BIOL 101. Teaches a broad range of field methods used in ecology. Focuses on quantitative techniques for studying animal populations: census techniques, capture/marking, radio telemetry, habitat assessment, behavioral observation and experiments, and design and logistics of field experiments. (2 lecture, 3 lab hours) (Formerly BIOL 189T, ECOL 141)

**BIOL 178. Systematic Biology (3)**
Prerequisite: BIOL 1A and 1B; BIOL 102 and 103 recommended. Modern theory and methods of phylogenetic analysis applied to the study of biodiversity and evolution. (2 lecture, 3 lab hours) (Formerly ECOL 174)

**BIOL 181. Seminar in Cellular and Molecular Biology (1)**
Prerequisites: BIOL 150 (may be corequisite) or permission of instructor. Trends and breakthroughs in cellular and molecular biology accessed through the primary literature. (1 seminar hour) (Formerly GENET 170)

**BIOL 189T. Topics in Biology (1-4; max total 6)**
Prerequisite: permission of instructor. Investigation of selected areas in the field of biology. (Lecture and/or laboratory)

**BIOL 190. Independent Study (1-3; max total 6)**
See *Academic Placement — Independent Study.* Approved for ***RP*** grading.

## GRADUATE COURSES

(See *Catalog Numbering System.*)

### *Biology (BIOL)*

**BIOL 208. Biological Field Studies (1-6; max total 6)**
Prerequisite: permission of instructor. Integrated studies or specialized topics, including botanical, environmental, microbiological, or zoological field studies.* Approved for ***RP*** grading.

**BIOL 225. Molecular Evolution (3)**
Patterns and processes by which biological molecules evolve. Lecture topics include rates and modes of DNA sequence evolution, molecular phylogenetics, gene duplication, concerted evolution, genome organization, and application of computers to comparative molecular analysis. (3 lecture hours)

**BIOL 230. Foundations of Ecology (2)**
Prerequisites: permission of instructor. Discusses ideas and papers that defined ecology as an independent scientific discipline, both in the context of their time of publication and in comparison to current ecological paradigms. Covers late 19th century to present. (Formerly BIOL 260T)

**BIOL 240. Systems Ecology (3)**
Prerequisites: BIOL 130, MATH 70. Quantitative approach to the analysis of whole ecosystems including data acquisition and statistical treatment, conceptual and mathematical ecosystem modeling, and computer simulations in FORTRAN or BASIC. No programming experience needed. (2 lecture, 3 lab hours)

**BIOL 241A-B. Molecular Biology I-II (3-3)**
(See CHEM 241A-B.) Prerequisites: BIOL 140A-B, CHEM 150 or 155, or permission of instructor. BIOL/CHEM 241A is prerequisite for BIOL/CHEM 241B. Current topics in

* Late afternoon, Saturday and/or overnight field trips may be required.