## *Zoology (ZOOL)*

**10. Animal Biology (3)**
Not open to students with credit in BIOSC 1B. Structural and functional comparison of animals; principles and human implications of inheritance, evolution, and ecology; physiology as applied to man. G.E. Breadth B2. (2 lecture, 2 lab hours)

**120. General Entomology (3)**
Prerequisites: BIOSC 1A, 1B. Anatomy, physiology, life history, and classification of insects and other arthropods. (2 lecture, 3 lab or field hours)*

**122. Economic Entomology (3)**
(See PLT H 103.)

**132. Comparative Vertebrate Morphology (4)**
Prerequisites: BIOSC 1A, 1B. Comparative structure of vertebrate organ systems; laboratory study of representative vertebrates. (2 lecture, 6 lab hours)

**141. Invertebrate Zoology (4)**
Prerequisites: BIOSC 1A, 1B. Systematics and phylogeny (based primarily upon external and internal anatomy) and general ecology of free-living invertebrates (excluding insects). Includes field studies of marine and occasionally freshwater habitats. (2 lecture, 6 lab or field hours)*

**148. Parasitology (4)**
Prerequisites: BIOSC 1A, 1B and CHEM 1A or 3A. A study of the biology of parasitic organisms, including those of humans. Lecture topics: life history strategies, infectious processes, epidemiology, ecology, parasite evolution and phylogeny, diagnosis and treatment. Laboratory and field exercises: identification and sampling techniques, taxonomy, investigation of biological processes. (3 lecture, 3 lab hours*)

**150. Natural History of Vertebrates (4)**
Prerequisite: BIOSC 130. Systematics, distribution, morphology, behavior, and ecology of fish, amphibians, reptiles, birds, and mammals. Fieldwork includes capture and sampling techniques, species identification and habitat analysis, and may require weekend field trips to coastal, desert, and mountain environments. (3 lecture, 3 lab or hours)*

**152. Animal Behavior (3)**
Prerequisite: BIOSC 130; one additional course in ecology or natural history recommended. Principles of ethology with emphasis on mechanisms of behavior. (2 lecture, 3 lab hours)*

**171. Ichthyology (3)**
Prerequisite: BIOSC 130. Ecology, evolution, and diversity of the fish of the world with emphasis on California fish, freshwater and marine. (2 lecture, 3 lab or field hours)*

**174. Biology of Reptiles and Birds (4)**
Not open to students with credit in ZOOL 137 or ZOOL 172. Prerequisite: BIOSC 130. Ecology, ethology, and evolution of the reptiles and birds of the world. Encompasses the traditional areas of herpetology and ornithology. (3 lecture, 3 lab or field hours)*

**177. Mammalogy (3)**
Prerequisite: BIOSC 130. Ecology, evolution, and diversity of the mammals of the world. (2 lecture, 3 lab or field hours)*

(See also *ECOL 171, 172; MICRO 171;* and *PHYAN* courses.)

## GRADUATE COURSES

(See *Course Numbering System*.)

## *Biology (BIOL)*

**204. Biology of Speciation (2)**
Prerequisites: BIOSC 140A-B and 180. Evolution of the species as a unit of biological organization.

**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 ***SP*** grading.

**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) (Formerly BIOL 189T)

**240. Systems Ecology (3)**
Prerequisites: BIOSC 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)

**241A-B. Molecular Biology I-II (3-3)**
(Same as CHEM 241A-B.) Prerequisites: BIOSC 140A-B, CHEM 150 or 155, or permission of instructor. BIOL/CHEM 241A is prerequisite for BIOL/CHEM 241B. Current topics in molecular biology are addressed, including protein and nucleic acid structure, DNA replication, transcription, translation, prokaryotic and eukaryotic regulation, mechanisms of exchange of genetic material, and recombinant DNA technology.

**242. Techniques in Protein Purification and Analysis (3)**
(Same as CHEM 242.) Prerequisite: CHEM 151 or 156 or permission of instructor. Corequisite: BIOL/CHEM 241A. Deals with the technologies relevant to protein isolation, purification, analysis, immobilization, and modification in micro and macro quantities. (1 lecture, 6 lab hours)

**243. Nucleic Acid Technology Lab (3)**
(Same as CHEM 243.) Prerequisites: BIOL/CHEM 241A and 242. Corequisite: BIOL/CHEM 241B. A lecture/laboratory course focusing on the technologies used in nucleic acid chemistry, such as synthesis, translation, mutagenesis, and genetic engineering. (1 lecture, 6 lab hours)

**244. Cell Culture and Hybridoma (3)**
(Same as CHEM 244.) Prerequisite: MICRO 185 or PHYAN 160 and 160L. The theory and practice of *in vitro* propagation of eukaryotic cells, including growth characteristics, metabolic requirements, and genetic analysis. Cloning, fusion, and generation of monoclonal antibody (hybridoma) are presented relative to cultured cell biology and application to biotechnology. (1 lecture, 6 lab hours)

**248. Seminar in Molecular Biology and Biotechnology (1-2; max total 4)**
(Same as CHEM 248.) Prerequisite: admission into the Biotechnology Certificate Program. Reviews and reports on current literature in various aspects of biotechnology and molecular biology.

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