DEPARTMENT OF BIOLOGICAL SCIENCES

Biology Course Descriptions

Back to Biology

BIO 134 Contemporary Biology. [BIOL 1308] Presentation for the non-science major of biological concepts and topical subjects related to science methods, embryological development, reproduction, genetics, evolution, human organ systems, disease, and environmental biology. Ethical considerations of reproduction and birth control, genetic engineering, environmental pollution and population control will be included. Credit in BIO 134 as a laboratory science is contingent upon completion of BIO 114. Credit in this course cannot be applied to either a major or minor in the sciences. Fall, Spring, Summer. Credit 3.

BIO 114 Contemporary Biology Laboratory. [BIOL 1108] Fall, Spring, Summer. Credit 1.

BIO 137 Environmental Science. [BIO 2306] A general course designed to cover all areas relating to contemporary ecological problems. Topics include air, water, and soil pollution; radiation, limnology, climate, pesticides, wastes, and land conservation. Fall, Spring. Credit 3.

BIO 117 Environmental Science Laboratory. [BIO 2106] Fall, Spring. Credit 1.

BIO 161 General Botany. [BIO 1311]. General principles of botany are presented. Emphasis is placed on morphology, taxonomy, genetics, physiology, and ecology of plants in an evolutionary and ecological context. Students may begin sequence with either BIO 161 or 162. Credit for BIO 161 as a laboratory science is contingent on completion of BIO 111. Fall, Spring, Summer. Credit 3.

BIO 111 General Botany Laboratory. [BIO 1111] Fall, Spring, Summer. Credit 1.

BIO 162 General Zoology. [BIO 1313]. General principles of zoology are presented in an evolutionary context. Emphasis is placed on the anatomy, behavior, and ecology of animals. Students are introduced to evolutionary and ecological principles of biology. Students may begin sequence with either BIO 161 or 162. Credit for BIO 162 as a laboratory science is contingent on completion of BIO 112. Fall, Spring, Summer. Credit 3.

BIO 112 General Zoology Laboratory. [BIO 1113] Fall, Spring, Summer. Credit 1.

BIO 234 Introductory Cell Biology. **(Effective Fall 2007 this course is BIO 244.)**A general cellular approach to biological principles is presented, including scientific methods, origins of life, biochemistry, cell structure, metabolism, cellular evolution, and cell division. Prerequisite: Minimum grade of C in BIO 161/111 and BIO 162/112. Fall, Spring. Credit 3.

BIO 244 Introductory Cell Biology. **(Prior to Fall 2007 this course was BIO 234.)**A general cellular approach to biological principles is presented, including scientific methods, origins of life, biochemistry, cell structure, metabolism, cellular evolution, and cell division. Prerequisite: Minimum grade of C in BIO 161/111 and BIO 162/112. Fall, Spring. Credit 3.

BIO 245 Human Anatomy. [BIOL 2401] This course deals with structure and form of the human body. It includes studies of cells, tissues, and organ systems. Registration is primarily for students in prenursing or majors in kinesiology or health. Credit in this course cannot be applied to either a major or minor in Biology. Two-hour laboratory. Fall, Spring. Credit 4.

BIO 246 Human Physiology. [BIOL 2402] This course will help students identify and understand the function of several important human organ systems and how these systems maintain homeostasis. Topics and the mechanisms involving circulation, digestion, metabolism, muscle action and respiration will receive the most emphasis. This course is designed to emphasize a clinical knowledge of physiology and techniques required by students studying nursing, physical therapy, and related health fields. Prerequisite: Minimum grade of C in BIO 245. Two-hour laboratory. Fall and Spring. Credit 4.

BIO 247 Introductory Applied Microbiology. [BIOL 2420] An introduction to microorganisms, their morphology, growth requirements, methods of culture, and the manner in which they affect health. Reactions of the body toward pathogenic organisms and the principles of immunity and chemotherapy are considered. Credit in this course cannot be applied to a major or minor in Biology. Two-hour laboratory. Writing enhanced. Fall, Spring. Credit 4.

BIO 336 Fish, Wildlife, Recreation Management. The history and basic principles, philosophy and concepts of wildlife management as they relate to habitats, people, and the problems associated with their interactions. Three-hour laboratory and field

work. Prerequisite: Minimum grade of C in BIO 161/111, 162/112. Fall. Credit 3.

BIO 340 General Ecology. A study of physical and biotic components of the environment, responses of organisms to their environment, community ecology, natural ecosystems, and human's interaction with ecosystems. Field studies are an integral part of the laboratory. Threehour laboratory and field work. Prerequisite: Minimum grade of C in BIO 161/111, 162/112. Fall, Spring. Credit 4.

BIO 341 Human Biology. This course deals with the study of structure and function of the human body. The structure of various organ systems are discussed and their function as organs and systems described. This course is not recommended for preprofessional students. Minimum grade of C in BIO 161/111, 162/112, 234. Two-hour laboratory. Fall, Spring. Credit 4.

BIO 342 Comparative Vertebrate Anatomy. A study of representative vertebrates, their anatomy, ontogeny, and phylogeny. The course is required of premedical students. Prerequisite: Minimum grade of C in BIO 161/111, 162/112 or consent of the instructor. Three-hour laboratory. Even year, Spring. Credit 4.

BIO 343 Plant Physiology. General course dealing with principal life processes of plants. Topics include photosynthesis, respiration, nutrition, flowering, dormancy, hormones, growth, and development. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234; CHM 138/118, 139/119. Three-hour laboratory. Writing enhanced. Odd year, Fall. Credit 4.

BIO 344 General Physiology. The study of the primary mechanisms by which autotrophic and heterotrophic organisms function. Important fundamental aspects of cellular, regulatory, and systemic physiology are presented emphasizing the functional aspect of living systems at the cellular and molecular levels. Students are expected to develop an integrated understanding of the areas presented and recognize the interdependence of these mechanisms in the maintenance of homeostasis. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234; CHM 138/118, 139/119, 238/218. Three-hour laboratory. Writing enhanced. Spring. Credit 4.

BIO 345 Introductory Genetics. Study is made of the physical bases of inheritance and principles of heredity and variation. Topics include Mendelian genetics, cytogenetics, molecular basis of genetics, gene expression and regulation, and DNA technologies. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234; CHM 138/118, 139/119. Two-hour laboratory. Writing enhanced. Fall, Spring. Credit 4.

BIO 346 Pathophysiology. A study of basic physiological systems and underlying system dysfunctions associated with human disease processes across the life span. Relationships between etiologic agents and their consequence to human form and function will be stressed. Critical thinking processes integrating symptoms, treatment and prognosis will be applied to physiological perspectives. Four hours lecture per week. Prerequisites: Minimum grade of C in CHM 135/115, BIO 245, 246 or consent of the instructor. Credit 4.

BIO 347 General Microbiology. An introduction to microorganisms including bacteria, viruses and fungi. Major areas considered are morphology, physiology, genetics, and pathology. Microorganisms are studied in relation to soil, water, food, industrial processes, and disease. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234 and 8 hrs. of chemistry. Two-hour laboratory. Writing enhanced. Fall, Spring. Credit 4.

BIO 348 Vertebrate Embryology. This is a study of the early development of representative vertebrates from fertilization until differentiation of organs has been completed. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234. Two-hour laboratory. Writing enhanced. Even year, Fall. Credit 4.

BIO 349 Histology. A study of animal tissues with emphasis on human materials. Identification and preparatory techniques are stressed. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234; CHM 138/118, 139/119. Three-hour laboratory. Writing enhanced. Spring. Credit 4.

BIO 364 Plant Taxonomy. A study of the characteristics and classification of plants emphasizing systematic techniques. Focus on identification of the more common plant families allows transfer of knowledge to other regions of the country and world. Prerequisite: Minimum grade of C in BIO 161/111, 162/112. Two-hour laboratory. Spring. Writing enhanced. Credit 3.

BIO 369 Economic Entomology. A study of basic principles of entomology as related to modern principles of insect pest management. Included are discussions of the biology and control of economically important insects in Texas. Collections of insects are made. Not open to students with credit in BIO 431. Two hours lecture and two hours laboratory. Prerequisites: Minimum grade of C in BIO 161/111, 162/112, and 234. Even year, Fall. Credit 3.

BIO 371 Plant Pathology. The study of the diseases common to field crops, orchards and gardens in Texas emphasizing the identification, cause and control of these diseases. Two hours lecture and two hours laboratory. Prerequisites: Minimum grade of C in BIO 161/111, 162/112, and 234. Odd year, Spring. Credit 3.

BIO 380 Field Biology. This course provides students with an informative, stimulating, and hands-on introduction to field biology and field research. This course introduces undergraduate students to field methods and to the ecology and natural history of a particular geographic region. This course consists of two parts: a weekly seminar during the semester that introduces and discusses the geographic region and ecological system (i.e. the Florida Everglades), and an off-campus field trip to that location during a semester break. Minimum grade of C in BIO 161/111, 162/112, and 234. Spring, Summer. Credit 3.

BIO 392 Plant Morphology. Survey of the plant kingdom with emphasis on morphogenesis, comparative structure and life cycles of representative plant forms. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, and 234. Three-hour laboratory. Fall, Summer. Credit 3.

BIO 410, Undergraduate Seminar.

BIO 411 Discussions of current literature in the biological sciences. Required of senior Biology majors. Prerequisite: Biology major, Senior standing. Fall, Spring. Credit 1 each.

BIO 430 Vertebrate Natural History. This course deals with the taxonomy, natural history, and ecology of vertebrates. Laboratories emphasize the identification of Texas Vertebrates and field techniques used in their study. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, and Junior standing. Two-hour laboratory. Spring. Credit 3.

BIO 431 General Entomology. A study is made of insect morphology, taxonomy, development, and life histories. Collection and identification by use of keys are stressed. Prerequisite: Minimum grade of C in BIO 161/111, 162/112. Junior standing. Two-hour laboratory. Odd year, Spring. Credit 3.

BIO 432 Environmental Toxicology. (Also listed as ESC 432). This course presents basic toxicology as a qualitative and quantitative science of the effects of poisons (toxins) upon the environment, individuals, and populations. The course will also provide a comparison of the toxicology of human and other species' exposure to common environmental contaminants. Writing enhanced. Prerequisite: BIO 161/111, 162/112, and 247 or 347; MTH 379 or BIO 474; 8 hrs. CHM, and Junior standing. Two one-hour lectures and one two-hour laboratory. Even year, Fall. Credit 3.

BIO 433 Aquatic Biology. Physical, chemical, and biological features of inland waters; organisms of freshwater; factors in biological productivity; methods and equipment. Largely a field course dealing with various approved methods of studying freshwater systems. This course is designed to meet the needs of chemists, teachers of science, biologists, and environmental scientists. Prerequisites: 11 hrs. biology. Minimum grade of C in BIO 161/111, 162/112, 8 hrs. CHM, and Junior standing. Two-hour laboratory. Spring. Credit 3.

BIO 434 Electron Microscopy. This course is designed to teach students the methods of preparing specimens for electron microscope analysis and to use the electron microscope as a tool to conduct research. Students will become competent in using the electron microscope for visual analysis or chemical elemental analysis. Prerequisites: Minimum grade of C in BIO 161/111, 162/112, 234, and 12 hrs. advanced biology, and Junior standing. Writing enhanced. Spring. Credit 3.

BIO 435 Immunology. Humoral and cell-mediated immunobiology, genetics, and chemistry are considered along with immunoanalyses and pathologies. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234, 345, 347; CHM 348 and Junior standing. Spring. Credit 3.

BIO 437 Microbial Ecology. This course introduces the student to basic ecological concepts through the study of microbial communities. Interactions at the microscopic and macroscopic levels will be discussed along with biogeochemical cycles. Bioremediation concepts will also be explored. Prerequisite: BIO 161/111, 162/112, 234, and 247 or 347; CHM 239/219, and Junior standing. Two one-hour lectures and one three-hour laboratory. Credit 3.

BIO 446 Parasitology. Morphology, life cycles, physiological adaptations, evolution, and distribution of parasitic animals. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234, and Junior standing. Three-hour laboratory. Odd year, Fall. Credit 4.

BIO 449 Cell Biology . A physical and chemical study of cells, their ultrastructure and nuclei. Studies of metabolism, growth, differentiation, and reproduction are included with special emphasis on mitosis and meiosis. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234, 345; CHM 138/118, 139/119, and Junior standing. Three-hour laboratory. Writing enhanced. Fall. Credit 4.

BIO 460 Philosophy of Biology. This course will help the student understand the philosophical issues associated with defining and applying theoretical terms and constructs within evolutionary biology. Minimum grade of C BIO 161/111, 162/112, 234, plus 8 hrs. advanced biology, and Junior standing. Writing enhanced. Even year, Spring. Credit 3.

BIO 461 Introductory Evolutionary Biology. Evolution is the core theory of modern biology. Students will be introduced to the major principles of evolutionary biology, from the history of evolutionary thought through theory and current concepts of evolution. Emphasis will be placed on molecular and cellular evolution, mechanisms of evolution including natural selection, gene flow, founder effect, and speciation. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234, 8 hrs. advanced biology, and Junior standing. Writing enhanced. Spring. Credit 3.

BIO 470 Animal Behavior. A study of the mechanisms and functional explanations of behavior. Experimental approaches to addressing questions of behavior will be emphasized. Topics will include behavioral genetics, neuroethology, migration, habitat selection, foraging, communication, social behavior, reproductive strategies, and human sociobiology. Field studies and independent projects will be integral components of this course. Prerequisite: Minimum grade of C BIO 161/111, 162/112, and Junior standing. Two-hour laboratory. Writing enhanced. Fall. Credit 3.

BIO 471 Invertebrate Zoology. This course will explore the diversity of invertebrate types morphologically, embryologically and physiologically. The ecological role of invertebrates will be emphasized. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, and Junior standing. Two-hour laboratory. Even year, Fall. Credit 3.

BIO 474 Biostatistics. This course includes an introduction to statistical methods and their application to real biological problems. Topics include descriptive statistics, probability distributions, estimation, hypothesis testing, correlation and regression, and analysis of variance. Use of the computer in statistical analyses will also be stressed. Prerequisites: MTH 170 or 142, 8 hrs. of biology. Fall. Credit 3.

BIO 480 Molecular Biology. This course emphasizes the structural and functional characteristics of proteins, RNA and DNA, and their individual and collective contributions to life. The course provides the conceptual and experimental framework for genetic engineering and the new Biotechnology. Models from prokaryotic and eukaryotic organisms as well as viruses and plasmids are used. The laboratory will include methods of gene cloning and electrophoretic analyses of proteins, RNA and DNA. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234, 345, 347; CHM 239/219, and Junior standing. Threehour laboratory. Writing enhanced. Spring. Credit 3.

BIO 493 Endocrinology. This course is designed to familiarize the student with the structure, development, comparative anatomy, and physiology of the endocrine system. Particular emphasis will be given to the endocrine control of reproductive processes. Prerequisite: Minimum grade of C in BIO 161/111, 162/112, 234; CHM 138/118, 139/119, and Junior standing. Two-hour laboratory. Writing enhanced. Odd year, Fall. Credit 3.

BIO 494 Biological Sciences Internship. A supervised, off-campus intern work experience in an approved area of the biological sciences with business, industry or government. This elective course provides the student with direct professional work experience in such areas as biotechnology, biomedical research, ecological assessment, wildlife biology, and science/nature education. Academic credit is based on a written technical report and an oral presentation. Prerequisites: Biology major, 6 hrs. of advanced biology, Junior standing, 3.0 GPA and approval of Department Chair. Writing enhanced. Credit 3.

BIO 495 Special Topics in Biology. This course is designed to allow independent study by selected advanced students in specific areas of biology not covered by organized undergraduate courses. Instruction is on individual basis with the student being supervised in his studies by an appropriate faculty member. Prerequisite: Biology major, minimum Junior standing. This course may be taken for Academic Distinction credit. See Academic Distinction Program in this Catalog. Credit 1, 2, or 3.

Back to Biology