There are in-services, practical examinations, clinical assessments and clinical experience requirements for completion of this course. Students must be admitted into the athletic training program to be eligible to enroll in the course. (*fall and spring semesters)

**476 Supervised Clinical Education ATT II (2)**

Prerequisite: consent of instructor. Involves practical experience in evaluation and care of athletic injuries including directed and self-directed clinical experiences at the University and off-campus clinical sites. Provides opportunity for development of critical thinking skills to integrate previously acquired knowledge and skills in clinical practice and the care of patients. There are in-services, practical examinations, clinical assessments and clinical experience requirements for completion of this course. Students must be admitted into the athletic training program to be eligible to enroll in the course. (*fall and spring semesters)

**495 Professional Topics in Athletic Training (3)**

Prerequisites: ATT 370 and consent of instructor. This course encompasses several of the professional-level competencies required for organization and administration in athletic training, including topics in budgeting, insurance, and legal issues. Case studies are used to facilitate learning. (*fall semester)

**Biology (BIO)**

See also marine science courses. All courses include lecture and laboratory, except where noted otherwise.

**112 Environmental Science (3) (IG)**

An interdisciplinary study concerned with the historical, ecological, social, political and economic ramifications of the global environmental crisis. Addresses such issues as demographics, energy, pollution, natural resources and environmental policy. Satisfies general curriculum distribution requirements. Is not applicable toward a biology or marine science major or minor. Lecture only. (*fall and spring semesters)

**124 Biological Science (3)**

This course is a survey of topics in biological sciences for students not majoring in biological or chemical sciences. The course is structured in a lecture/discussion format to allow flexibility in pursuit of contemporary topics in biology. Satisfies a portion of the natural science component of the general curriculum distribution, but is not applicable toward a biology or marine science major or minor. Lecture only. (*fall and spring semesters)

**128 Fundamentals of Science (3)**

This course deals with fundamental principles of physical, chemical and biological science including methods of scientific inquiry and philosophy, techniques for analysis of scientific data, scientific writing and scientific vocabulary. The course is intended for prospective science majors in preparation for taking BIO 203 and BIO 204. Credit for this course counts as a general elective toward graduation. Lecture only. Students must complete BIO 128 with a grade of “C” or better. (*fall semester)

**183 Microbiology for the Allied Health Sciences (3)**

Prerequisite: CHE 150 or equivalent. This course focuses on diseases and the organisms that cause them. This includes bacteria, viruses, fungi, rickettsia and disease-causing protozoan. Additionally, the course focuses on infectious disease caused by medical and surgical practices and accidental injuries. Lecture only. (*fall and spring semesters)

**203 Biological Diversity (laboratory included) (4)**

Examines the diversity in the plant and animal phyla, emphasizing taxonomy, ecology, behavior, evolution and reproduction. Must be completed with a grade of “C” or better to count toward biology lower core requirements. (*fall and spring semesters)
204 Biological Unity (laboratory included) (4)
   Co-requisites: CHE 152 and 153. A study of cellular biology, emphasizing cell structure, metabolism, control mechanisms, and genetic systems of plants and animals. Must be completed with a grade of “C” or better to count toward biology lower core requirements. (*fall and spring semesters)

212 Ecology (laboratory included) (4) (W)
   Prerequisites: biology lower core curriculum. Ecology examines relationships between species and their environment. Students explore the contributions of abiotic and biotic factors to limitations in numbers and distributions of organisms. A strong emphasis is placed upon classical ecological issues such as production dynamics, predator-prey interactions, competition and life history strategies in marine, freshwater and terrestrial ecosystems. (*fall semester)

220 Behavioral Biology (4)
   Prerequisites: biology lower core curriculum (or equivalent). This course focuses on recent advances concerning the evolution and adaptive significance of behavior from a comparative point of view. Topics include the genetic basis of behavior, the nervous system and integration of behavior, innate behaviors vs. learning and memory, social behavior, mating, predator-prey relationships and the biological bases of aggression, territoriality and communication. This course also addresses some of the above topics as they pertain specifically to marine animals. This course may be used as one of the required electives for the biology, marine science-biology, or environmental science majors. Lecture only. (*fall semester)

224 Invertebrate Zoology (laboratory included) (4)
   Prerequisites: biology lower core curriculum. A study of the structure, physiology, life histories and group relationships of invertebrate animals. (*fall and spring semesters)

225 Vertebrate Zoology (laboratory included) (4)
   Prerequisites: biology lower core curriculum. A study of the structure, ecology, behavior and taxonomy of the major vertebrate classes. (*fall and spring semesters)

227 Ecosystems and Ecophysiology (laboratory included) (4)
   Prerequisites: biology lower core curriculum. A study of the interaction between organisms and their environment, with a focus on stress physiology. Covers detailed measurement of environmental parameters impacting animal metabolism and primary production. Will focus on the adaptive and acclimative mechanisms in animals, plants, and symbiotic relationships in coping with environmental stresses. Major topics include osmoregulation, metabolism, circulation, excretion, hormonal controls, coping with extremes in salinity, heat, and oxygen, radiation, temperature, water relations, stomatal mechanics, evapotranspiration, photosynthesis, respiration, greenhouse effect, and drought. The emphasis of the laboratory will be on research exploring the adaptive and acclimative strategies employed by organisms under stress. (*spring semester)

228 Biology of Plants (laboratory included) (4) (W)
   Prerequisites: biology lower core curriculum. Studies the morphology, anatomy and physiology of vascular plants, with emphasis on plants and their role in human society. Additional emphases are placed upon plants’ reproduction, response to environmental change, ethnobotany, medicinal botany, and the development and uses of plants in ancient and modern human societies. (*fall and spring semesters)

230 Introduction to Experimental Design and Biostatistics (4)
   Prerequisites: biology lower core curriculum. This course investigates the use of statistical methodology to evaluate biological hypotheses. Topics include basic experimental design, descriptive statistics, and scientific inference and hypothesis testing, using statistical tests such as analysis of variance, correlation, regression, contingency tables and nonparametric equivalents. Example data sets drawn from ecology, general biology and biomedical sciences are used to explore concepts, and class time is broken into lecture and laboratory components. (*fall semester)
235 Introduction to Geographic Information Systems (3)
This course is aimed at teaching students the applications of geographic information systems technology to a variety of biological issues including delimiting species and habitat distribution, identifying landscape-level relationships between abiotic and biotic factors and their spatial effects on populations, identifying potential effects of human activity on natural areas and populations, and developing management and regulatory policies including defining potential protected areas. Cross-listed with GEO 235.

242 Introduction to Environmental Science and Policy (lecture & discussion group) (4) (IG) (W)
Prerequisites: biology lower core curriculum. The course covers many of the most threatening environmental problems facing society. When possible, these issues are discussed at local, national and global levels to demonstrate how policy and cultural differences impact the various threats to the environment and the human population. Environmental threats are discussed both in the context of their impact on natural ecosystems and their potential threat to human health and economic growth. This course may be used as an elective for marine science-biology and biology majors, and is a required course for a major and minor in environmental science. (*fall semester only)

250 Comparative Vertebrate Anatomy (laboratory included) (4)
Prerequisites: biology lower core curriculum. Examines vertebrate evolution through a detailed study of the systems of the vertebrates. (*fall semester)

300 General Genetics (laboratory included) (4)
Prerequisites: biology lower core curriculum. A detailed survey of Mendelian, molecular and evolutionary genetics. Topics covered include mechanisms and patterns of inheritance, recombination, linkage, mapping, gene expression and regulation, mutation, DNA damage and repair, DNA technologies, population and quantitative genetics. (*fall semester)

307 Microbiology (laboratory included) (4) (W)
Prerequisites: biology lower core curriculum. A study of the structure, function and taxonomy of microorganisms, and their interactions with humans and their environment. (*fall semester)

310 Developmental Biology (laboratory included) (4) (W)
Prerequisites: biology lower core curriculum. BIO 250 recommended. A study of the developmental process in animals, with emphases on cellular mechanisms, controlling development and morphology of embryos. (*spring semester of odd-numbered years)

317 Parasitology (laboratory included) (4)
Prerequisites: biology lower core curriculum. A study of the major groups of parasites, emphasizing those affecting humans and domesticated animals. Examines the morphology, life history, ecology and pathogenicity of each parasite. (*spring semester)

320 Molecular Genetics (laboratory included) (4)
Prerequisites: biology lower core curriculum. This course addresses the major concepts in the field of genetics with an emphasis on the molecular basis of genetics. Major topics include DNA and protein chemistry, prokaryotic and eukaryotic DNA replication, transcription, translation and gene regulation, protein trafficking, pedigree analysis, DNA technologies, DNA damage and repair, recombination, transposable elements, genomics, chromosome structure, transgenic organisms and current advances in molecular genetics. (*spring semester)

330 General Physiology (laboratory included) (4)
Prerequisites: biology lower core curriculum. A study of the major physiological systems of animals from a comparative perspective. Covers functional anatomy, homeostasis, evolutionary relationships, neurophysiology, dynamics of muscle contraction, endocrinology, cardiovascular physiology and environmental physiology. (*fall semester)
340 Ichthyology (laboratory included) (4) (W)
Prerequisite: biology lower core curriculum and BIO 225 or 250. This course examines the relationship between the unifying biological principles of evolutionary adaptation and the diversity of form and function found among fishes. The course considers the physical and biological selective pressures this group of vertebrates has faced during its evolutionary history and the morphological, physiological, developmental and behavioral adaptations that have arisen in response to these ecological factors. How fishes function in marine and freshwater ecosystems and the management actions being taken to conserve fishes as natural resources also are examined. (*spring semester)

346 Conservation Biology (4) (W)
Prerequisite: biology lower core curriculum, and BIO 212 or MAR 222. A study of the biological and human factors relating to the current global extinction crisis and how conservation practices are used to evaluate and preserve threatened species and habitats. Emphases are placed upon how issues in ecology, population, biology and taxonomy affect the status of a species, and how these issues relate to policy and management decisions. Materials covered will be connected to current literature in weekly discussion periods. This course may be used as one of the required electives for biology and marine science-biology majors. Lecture only. (*spring semester)

350 Cell Biology (laboratory included) (4)
Prerequisites: biology lower core curriculum and CHE 232. A study of general cellular organization, the physico-chemical aspects of living systems, cell energetics, cell membrane systems, signal transduction and second messenger systems, membrane phenomenon and cell cycle. (*spring semester)

360 Immunology (laboratory included) (4) (W)
Prerequisites: biology lower core curriculum and CHE 232. BIO 307 is recommended. A study of the fundamental concepts of immunology, including the essentials of immunological expression, cellular and humoral immunity, immunity and disease, auto-immunity, and developmental and comparative immunology, focusing on landmark experiments that underlie its theoretical framework. (*spring semester)

370 Molecular Biology (laboratory included) (4)
Prerequisites: biology lower core curriculum. This course is designed to provide a background in molecular biology with a focus on the regulation of gene expression and the experimental approaches used to study this regulation. Topics include DNA replication, transcription, translation, and the mechanisms that regulate these processes. Cancer genetics and mammalian coat color genetics also are discussed as models for gene regulation. The laboratory portion of the course provides experiential learning of some of the laboratory techniques discussed in lecture. Topics covered in the laboratory include DNA extraction, PCR cloning of a gene, gene expression analysis, DNA sequencing, and analysis using bioinformatics.

390 Essentials of Electron Microscopy (4)
Prerequisites: biology lower core curriculum and consent of instructor. Introduces the techniques used in preparation and viewing of biological specimens on the scanning and transmission electron microscopes. (*occasionally)

400 Evolution (4)
Prerequisites: biology lower core curriculum or junior standing. A study of the scientific foundations of evolutionary theory and the mechanisms responsible for evolutionary change. Topics covered include an historical perspective of evolution, origin of life, natural selection and adaptation, levels of selection, fitness concepts, speciation, Darwinian evolution and punctuated equilibria, extinction, the fossil record, life history evolution and human evolution. Lecture only. (*spring semester)
410 Senior Seminar (1)
Prerequisite: senior standing in biology or marine science. An in-depth study of a current topic in biology. Requires independent study project and presentation. (*fall and spring semesters)

440 Selected Topics in Biology (2) (W)
Prerequisites: at least 16 hours in biology, minimum grade point average of 2.75 in the major, and faculty consent. Students select a topic of interest in biology and explore the subject thoroughly through independent library research. A formal paper with extensive literature review is presented to a committee of the biology faculty. Oral presentation of results can be used in place of BIO 410. (*fall and spring semesters)

450 Biological Research (4) (W)
Prerequisites: at least 16 hours in biology, a GPA of 3.0 in the major, and consent of department chairperson. Problems must be selected in consultation with the department chairperson and the professor in charge of the project. Requires two hours each week for each credit attempted, a research paper, and oral presentation of topic. (*fall and spring semesters)

480 Biology Laboratory Practicum (1)
Prerequisite: permission of the instructor. Through direct involvement both in and out of the classroom, students gain practical knowledge of instruction in a college biology laboratory. Under the supervision of faculty, students are involved in the aspects pertaining to teaching a semester's biology laboratory. This may include, but is not limited to, presenting introductory material, aiding students during laboratories, development and critique of evaluation component(s), and laboratory preparation and maintenance. Counts as general elective only. (*fall and spring semesters)

495 Special Topics (1-4)
Requires permission of instructor. A lecture or laboratory course offered at the discretion of the Biology Department. Subject may focus on a current issue in biology, training in a specific research technique, or an area of biology that is of interest to a particular group of students.

499 Biological Internship (1-8)
Prerequisites: BIO 203 and 204, 56 semester hours of credit with at least a 3.0 average in the major, or approval of the department. Note: Prerequisite courses may be specified by the employer. Provides practical experience in science-related programs in a firm or agency, under the supervision of faculty and firm representatives. Can be accomplished on a part-time or fulltime basis. Graded on a pass-fail basis. Counts as a general elective only. (*fall and spring semesters)

Career Services (CAR)
201 Career Decision Making (1)
Prerequisites: Second-semester freshmen and sophomores, incoming transfer students (freshman or sophomore status) and sophomores who have not yet declared a major or who are unsure of their previously declared major. Students will gain an understanding of the process of career decision-making. They will explore interests, skills, values and personality and learn how they relate to major and career choices.

401 Job Search Strategies (1)
Prerequisite: junior or senior standing. Covers current trends of job searching. Resume development, interviewing techniques, proper correspondence, resumes for the Internet, and job searching through various media are addressed through professional lectures, research methods, guest lecturers and class assignments. (*seven weeks)